

SERA ENVIRONMENTAL GLOSSARY

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A large number of environmental glossaries are available on the Internet. The current glossary is based on previous glossaries prepared by Syracuse Environmental Research Associates for various Forest Service risk assessments. For a more extensive series of definitions, other sources should be consulted, including but not limited to:

Source:	Link
General Environmental Glossaries	
California Department of Toxic Substance Control	http://www.dtsc.ca.gov/InformationResources/Glossary_of_Environmental_Terms.cfm
The United Nations Environment Programme	http://www.nyo.unep.org/action/ap1.htm
European Environmental Glossary	http://glossary.eea.europa.eu/EEAGlossary/
Glossary of environmental science	http://en.wikipedia.org/wiki/Glossary_of_environmental_science
The Green Glossary	http://lifegoggles.com/652/the-green-glossary-environmental-terms-explained/
Toxicology Glossaries	
ATSDR Glossary	http://www.atsdr.cdc.gov/glossary.html
IUPAC Glossary	http://sis.nlm.nih.gov/enviro/iupacglossary/frontmatter.html
U.S. EPA/Glossary of Terms	http://www.epa.gov/OCEPATERMS/

Abiotic – No involving living organisms.

Absorbed dose – In exposure assessment, the amount of a substance that penetrates an exposed organism's absorption barriers (e.g. skin, lung tissue, gastrointestinal tract) through physical or biological processes. The term is synonymous with internal dose.

Absorption – The process by which the agent is able to pass through body membranes and enter an organism. In mammals and many other animals, the main routes by which toxic agents are absorbed are the gastrointestinal tract, lungs, and skin.

Active ingredient – In any pesticide product, the component that kills, or otherwise controls, target pests. Pesticides are regulated primarily on the basis of active ingredients.

ACGIH – American Conference of Governmental Industrial Hygienists. An organization of professionals in governmental agencies or educational institutions engaged in occupational safety and health programs. ACGIH develops and publishes recommended occupational exposure limits for chemical substances and physical agents (see TLV).

Acronym – a word or name that is formed by joining the first letters (or first few letters) of a series of words.

ACS – American Chemical Society.

Active ingredient (a.i.) – the ingredient of a product that actually does what the product is designed to do. The remaining ingredients may be termed "inerts".

Acute effect – An adverse effect on any living organism in which severe symptoms develop rapidly and often subside after the exposure stops.

Acute exposure – A single exposure or multiple brief exposures occurring within a short time (e.g., 24 hours or less in humans). The classification of an exposure as “acute” is dependant on the life span of the organism.

Acute lethality – the death of animals in a short period of time (typically up to 14 days in mammals) after a single dose of or exposure to a toxic substance.

Acute toxicity – any poisonous effect produced by a single short- term exposure, that results in severe biological harm or death.

Adaptation – Changes in an organism's physiological structure or function or habits that allow it to survive in new surroundings.

Additive effect – A situation in which the combined effects of two chemicals is equal to the sum of the effect of each chemical given alone. The effect most commonly observed when two chemicals are given together is an additive effect.

Adjuvant(s) – Formulation factors used to enhance the pharmacological or toxic agent effect of the active ingredient.

Adsorption – The tendency of one chemical to adhere to another material such as soil.

Adverse-effect level (AEL) – Signs of toxicity that must be detected by invasive methods, external monitoring devices, or prolonged systematic observations. Symptoms that are not accompanied by grossly observable signs of toxicity. In contrast to Frank-effect level.

Advisory – a non-regulatory document that communicates risk information to persons who may have to make risk management decisions.

Aerobic – life or processes that require, or are not destroyed by, the presence of oxygen. (see also, anaerobic).

Agent – any substance, force, radiation, organism, or influence that affects the body. The effects may be beneficial or injurious.

Algae – simple plants containing chlorophyll. Many are microscopic, but under conditions favorable for their growth they grow in colonies and produce mats and similar nuisance masses.

Algal blooms – sudden spurts of algal growth, which can affect water quality adversely and indicate potentially hazardous changes in local water chemistry.

Alkali – broadly, any compound having highly basic properties; i.e., one that readily ionizes in aqueous solution to yield OH anions, with a pH above 7.

Alkaline phosphatase – An enzyme that occurs in various normal and malignant tissues. The activity of the enzyme in blood is useful in diagnosing many illnesses.

Allelopathy – translocation of a herbicide to the roots of plants and subsequent loss from the roots to the surrounding soil, possibly posing a risk to neighboring vegetation.

Allometric – pertaining to allometry, the study and measure of growth. In toxicology, the study of the relationship of body size to various physiological, pharmacological, pharmacokinetic, or toxicodynamic processes among species.

Alopecia – loss of hair.

Alluvial – Relating to mud and/or sand deposited by flowing water. Alluvial deposits may occur after a heavy rain storm.

Ambient – usual or surrounding conditions.

Amphibian – A cold-blooded vertebrate capable of operating on land and in water.

Anadromous – fish that spend their adult life in the sea but swim upriver to fresh water spawning grounds to reproduce.

Anaerobic – life or process that occurs in, or is not destroyed by, the absence of oxygen.

Anions – negatively charged ions in solution e.g., hydroxyl or OH⁻ moiety.

Anorexia – loss of appetite.

Anoxia – a lack of oxygen from inspired air (literally, "without oxygen").

Antagonism – the interaction of two chemicals having an opposing, or neutralizing, effect on each other, or given some specific biological effect a chemical interaction that appears to have an opposing or neutralizing effect over what might otherwise be expected.

Antibodies – proteins produced in the body by immune system cells in response to antigens, and capable of combining with antigens.

Antidote – a remedy to relieve, prevent, or counteract the effects of a poison. Eliminating the poison, neutralizing it, or absorbing it are effective.

Antigens – a substance that causes production of antibodies when introduced into animal or human tissue.

Anuria – absence or defective excretion of urine.

Apnea – a temporary stoppage of breathing.

Aqueous – describes a water-based solution or suspension.

Aquifer – An underground geological formation, or group of formations, containing usable amounts of groundwater that can supply wells and springs.

Arid – A terrestrial region lacking moisture, or a climate in which the rainfall is not sufficient to support the growth of trees or woody plants.

Assay – A kind of test (noun); to test (verb).

Asymptomatic – neither causing nor exhibiting symptoms.

Ataxia – loss of reflexes or muscular coordination.

Atrophy – reduction in size or function of tissue, organs, or the entire body caused by lack of use.

ATSDR – Agency for Toxic Substances and Disease Registry; federal agency within the Public Health Service charged with carrying out the health-related responsibilities of CERCLA and RCRA.

Background level – in pollution, the level of pollutants commonly present in ambient media (air, water, soil).

Bacteria – Microscopic living organisms that can aid in pollution control by metabolizing organic matter in soil, water, or other environmental media. Some bacteria can also cause human, animal and plant health problems.

Basal application – in pesticides, the spreading of a chemical on stems or trunks just above the soil line.

Base – substances that (usually) liberate OH anions when dissolved in water and weaken a strong acid.

Benchmark – a dose associated with a defined effect level or designated as a no effect level that is used to characterize risk by comparing the benchmark dose to an estimate of the anticipated dose that an organism could be exposed to.

Benthic region – the bottom layer of a body of water.

Benthos – the plants and animals that inhabit the bottom of a water body.

Bioaccumulation – The increase in concentration in living organisms as they take in contaminated air, water, or food because the substances are very slowly metabolized or excreted.

Bioassay – 1.) using living organisms to measure the effect of a substance, factor, or condition. 2. a test to determine the toxicity of an agent to an organism.

Bioconcentration – The accumulation of a chemical in tissues of a fish or other organism to levels greater than in the surrounding medium.

Bioconcentration factor (BCF) – The concentration of a compound in an aquatic organism divided by the concentration in the ambient water of the organism.

Biodegradability – susceptibility of a substance to decomposition by microorganisms; specifically, the rate at which compounds may be chemically broken down by bacteria and/or natural environmental factors.

Biological Magnification – Refers to the process whereby certain substances such as pesticides or heavy metals move up the food chain, work their way into rivers or lakes, and are eaten by aquatic organisms such as fish, which in turn are eaten by large birds, animals or humans. The substances become concentrated in tissues or internal organs as they move up the chain.

Biologically sensitive – A term used to identify a group of individuals who, because of their developmental stage or some other biological condition, are more susceptible than the general population to a chemical or biological agent in the environment.

Biomass – the amount of living matter in a given unit of the environment.

Biota or Biome – all living organisms of a region or system.

BMPs – Best Management Practices.

Body Burden – The amount of a chemical stored in the body at a given time, especially a potential toxin in the body as the result of exposure.

Bog – A type of wetland that accumulates appreciable peat deposits. Bogs depend primarily on precipitation for their water source, and are usually acidic and rich in plant residue with a conspicuous mat of living green moss.

Brackish – Mixed fresh and salt waters.

Bradycardia – a decrease in normal heart rate.

Broadcast application – in pesticides, to spread a chemical over an entire area.

Broadleaf weed – A nonwoody dicotyledonous plant with wide bladed leaves designated as a pest species in gardens, farms, or forests.

Buffer zones – Strips of land that separate a waterway (ditch, stream, creek, pond or lake) from an area being treated with a chemical.

Cancer potency parameter – A model-dependent measure of cancer potency (mg/kg/day)⁻¹ over lifetime exposure. (Often expressed as a q1* which is the upper 95% confidence limit of the first dose coefficient (q1) from the multistage model.)

Capillary Fringe – The zone above the water table within which the porous medium is saturated by water under less than atmospheric pressure.

Carboxyhemoglobin – Hemoglobin in which the iron is bound to carbon monoxide(CO) instead of oxygen.

Carcinogen – A chemical capable of inducing cancer.

Carcinoma – A malignant tumor.

Cardiovascular – the heart and blood vessels.

Carrier – In commercial formulations of insecticides or control agents, a substance added to the formulation to make it easier to handle or apply.

CAS Registration number – an assigned number used to identify a material. CAS stands for Chemical Abstracts Service, an organization that indexes information published in Chemical Abstracts by the American Chemical Society and that provides index guides by which information about particular substances may be located in the abstracts. Sequentially assigned CAS numbers identify specific chemicals. The numbers have no chemical significance. The CAS number is a concise, unique means of material identification.

Categorical Exclusion – A class of actions which either individually or cumulatively would not have a significant effect on the human environment and therefore would not require preparation of an environmental assessment or environmental impact statement under the National Environmental Policy Act (NEPA).

Cation – positively charged ions in a solution.

Central nervous system (CNS) – the portion of the nervous system consisting of brain and spinal cord.

Chlorophenoxy – A class of herbicides including 2,4-D (2,4-dichlorophenoxy acetic acid) and 2,4,5-TP (2,4,5-Trichlorophenoxy propionic acid).

Chlorophyll – A class of molecules found in plant cells that plants their green color. Plants use chlorophyll to convert the energy of sunlight to food in the process known as photosynthesis.

Cholinesterase – An enzyme found in animals that regulates nerve impulses. Cholinesterase inhibition is associated with a variety of acute symptoms such as nausea, vomiting, blurred vision, stomach cramps, and rapid heart rate.

Chlorosis – Yellowing or blanching of the leaves of plants. Restricted to causes other than light deficiency.

Chronic exposure – Long-term exposure studies often used to determine the carcinogenic potential of chemicals. These studies are usually performed in rats, mice, or dogs and extend over the average lifetime or for a significant fraction of the lifetime of the species (for a rat, chronic exposure is typically about 2 years).

Chronic RfD – an estimate (with uncertainty spanning perhaps an order of magnitude or greater) of a lifetime daily exposure level for the human population, including sensitive subpopulations, that is likely to be without an appreciable risk of deleterious effects. Chronic RfDs are specifically developed to be protective for long-term exposure to a compound (7 years to lifetime).

Clay Soil – Soil material containing more than 40 percent clay, less than 45 percent sand, and less than 40 percent silt.

Clear cut – Harvesting all the trees in one area at one time.

Code of Federal Regulations (CFR) – Document that codifies all rules of the executive departments and agencies of the federal government. It is divided into fifty volumes, known as titles. Title 40 of the CFR (referenced as 40 CFR) lists all environmental regulations.

Coliform – Microorganisms found in the intestinal tract of humans and animals. Their presence in water indicates fecal pollution and potentially dangerous bacterial contamination by disease-causing microorganisms.

Confidential Business Information (CBI) – Material that contains trade secrets or commercial or financial information that has been claimed as confidential by its source (e.g. a pesticide or new chemical formulation registrant). EPA has special procedures for handling such information.

Conifer – An order of the Gymnospermae, comprising a wide range of trees, mostly evergreens that bear cones and have needle-shaped or scalelike leaves; timber commercially identified as softwood.

Conjunctivitis – Inflammation of the conjunctive, the delicate membrane that lines the eyelid and covers the eyeball.

Connected actions – Exposure to other chemical and biological agents in addition to exposure to the control agent during program activities to control vegetation.

Contaminants – For chemicals, impurities present in a commercial grade chemical. For biological agents, other agents that may be present in a commercial product.

Controls – In toxicology or epidemiology studies, a population that is not exposed to the potentially toxic agent under study.

Cornea – the transparent structure of the external layer of the eyeball.

Creatine – An organic acid composed of nitrogen. It supplies the energy required for muscle contraction.

Creatinine – The end product of the metabolism of creatine. It is found in muscle and blood and is excreted in the urine.

Critical Effect – The first adverse effect, or its known precursor, that occurs as a dose rate increases. Designation is based on evaluation of overall database.

Cumulative exposures – Exposures resulting from one or more activities that are repeated over a period of time.

Dams – A term used to designate females of some species such as rats.

Defoliant – a herbicide that removes leaves from trees and growing plants.

Degraded – Broken down or destroyed.

Denitrification – Bacterial reduction of nitrite to gaseous nitrogen under anaerobic conditions.

Dermal – Pertaining to the skin.

Dermal Absorption/Penetration – Process by which a chemical penetrates the skin and enters the body as an internal dose.

Dermatitis – inflammation of the skin.

Detritus – Loose fragments, particles, or grains formed by the disintegration of rocks.

Diatoms – organisms related to algae, having a brown pigmentation and siliceous skeleton.

Dislodgeable residues – The residue of a chemical or biological agent on foliage as a result of aerial or ground spray applications, which can be removed readily from the foliage by washing, rubbing or having some other form of direct contact with the treated vegetation.

Dissociate – the process of ionization of an electrolyte or a salt upon being dissolved in water, forming ions of cation and anion. Acids have a net negative charge when dissociated (A-) but do not have a charge when protonated (AH)

Dosage/Dose – 1. The actual quantity of a chemical administered to an organism or to which it is exposed. 2. The amount of a substance that reaches a specific tissue (e.g. the liver). 3. The amount of a substance available for interaction with metabolic processes after crossing the outer boundary of an organism. (See – absorbed dose, administered dose, applied dose, potential dose.)

Dose Equivalent – The product of the absorbed dose from ionizing radiation and such factors as account for biological differences due to the type of radiation and its distribution in the body in the body.

Dose Rate – In exposure assessment, dose per time unit (e.g. mg/day), sometimes also called dosage.

Dose Response – Shifts in toxicological responses of an individual (such as alterations in severity) or populations (such as alterations in incidence) that are related to changes in the dose of any given substance.

Dose-response assessment – A description of the relationship between the dose of a chemical and the incidence of occurrence or intensity of an effect. In general, this relationship is plotted by statistical methods. Separate plots are made for experimental data obtained on different species or strains within a species.

Dose Response Curve – Graphical representation of the relationship between the dose of a stressor and the biological response thereto.

Dose-Response Assessment – 1. Estimating the potency of a chemical. 2. In exposure assessment, the process of determining the relationship between the dose of a stressor and a specific biological response. 3. Evaluating the quantitative relationship between dose and toxicological responses.

Dose-Response Relationship – The quantitative relationship between the amount of exposure to a substance and the extent of toxic injury or disease produced.

Drift – That portion of a sprayed chemical that is moved by wind off a target site.

Dystrophic – Acidic, shallow bodies of water that contain much humus and/or other organic matter, many plants but few fish.

EC50 – A concentration that causes 50% inhibition or reduction. As used in this document, this values refers to a 50% inhibition of growth.

EC100 – A concentration that causes complete inhibition or reduction. As used in this document, this values refers to a complete inhibition of growth.

Ecosystem – The interacting system of a biological community and its non-living environmental surroundings.

Edema – an abnormal accumulation of clear, watery fluid in body tissue.

Electrochemical process – A newer manufacturing process for clopyralid. Details of the method are proprietary.

Embryo – an organism in the early stages of development before birth. In humans, the developing child is considered an embryo from conception to the end of the second month of pregnancy.

Empirical – Refers to an observed, but not necessarily fully understood, relationship in contrast to a hypothesized or theoretical relationship.

Endangered species – animals, birds, fish, plants, or other living organisms threatened with extinction by man-made or natural changes in their environment. Requirements for declaring a species endangered are contained in the Endangered Species Act.

Environmental assessment – a written environmental analysis which is prepared pursuant to the National Environmental Policy Act to determine whether a federal action would significantly affect the environment and thus require preparation of a more detailed environmental impact statement.

Environmental Equity/Justice – Equal protection from environmental hazards for individuals, groups, or communities regardless of race, ethnicity, or economic status. This applies to the development, implementation, and enforcement of environmental laws, regulations, and policies, and implies that no population of people should be forced to shoulder a disproportionate share of negative environmental impacts of pollution or environmental hazard due to a lack of political or economic strength levels.

Environmental fate – The destiny of a chemical or biological pollutant after release into the environment.

Environmental impact statement (EIS) – A document which identifies and analyzes, in detail, environmental impacts of a proposed action. As a tool for decision-making, the EIS describes positive and negative effects and lists alternatives for an undertaking. Required by NEPA.

Enzymes – A biological catalyst; a protein, produced by an organism itself, that enables the splitting (as in digestion) or fusion of other chemicals.

Epidemiology study – A study of a human population or human populations. In toxicology, a study which examines the relationship of exposures to one or more potentially toxic agent to adverse health effects in human populations.

Epilimnion – Upper waters of a thermally stratified lake subject to wind action.

Erosion – The wearing away of land surface by wind or water.

Estimated/Expected Environmental Concentration (EEC) – The estimated or expect pesticide concentration in an environmental media based on a particular set of assumptions and/or models.

Estuary – brackish water ecosystems that are regions of interaction between rivers and ocean waters, where tidal action and river flow create a mixing of fresh and salt water. These areas may include bays, mouths of rivers, salt marshes, and lagoons.

Eutrophication – the slow aging process of a lake evolving into a marsh and eventually disappearing. During eutrophication the lake is choked by abundant plant life.

Evapotranspiration – the loss of water from the soil both by evaporation and by transpiration from the plants growing in the soil.

Exposure assessment – The process of estimating the extent to which a population will come into contact with a chemical or biological agent.

Exotic species – A species that is not indigenous to a region.

Experimental Use Permit – Obtained by manufacturers for testing new pesticides or uses thereof whenever they conduct experimental field studies to support registration on 10 acres or more of land or one acre or more of water.

Extrapolation – The use of a model to make estimates outside of the observable range.

Fetal anomaly – An abnormal condition in a fetus, which is usually the result of a congenital defect.

Field capacity – The maximum amount of water that a soil can retain after excess water from saturated conditions has been drained by the force of gravity.

FIFRA Pesticide Ingredient – An ingredient of a pesticide that must be registered with EPA under the Federal Insecticide, Fungicide, and Rodenticide Act. Products making pesticide claims must register under FIFRA and may be subject to labeling and use requirements.

Flowable – Pesticide and other formulations in which the active ingredients are finely ground insoluble solids suspended in a liquid. They are mixed with water for application.

Food chain – a sequence of organisms, each of which uses the next, lower member of the sequence as a food source.

Formulation – A commercial preparation of a chemical including any inerts and/or contaminants.

Fugitive Loss – When applied to dermal exposure, the chemical lost from the surface of the skin by means other than dermal absorption – i.e., volatilization, washing, abrasion, exfoliation.

Frank effects – Obvious signs of toxicity.

Frank-effect level (FEL) – The dose or concentration of a chemical or biological agent that causes gross and immediately observable signs of toxicity.

Fungi – molds, mildews, yeasts, mushrooms, and puffballs, a group of organisms that lack chlorophyll (i.e., are not photosynthetic) and which are usually non-mobile, filamentous, and multicellular. Some grow in the ground, others attach themselves to decaying trees and other plants, getting their nutrition from decomposing organic matter.

Game Fish – Species like trout, salmon, or bass, caught for sport. Many of them show more sensitivity to environmental change than "rough" fish.

Gavage – The placement of a toxic agent directly into the stomach of an animal, using a gastric tube.

Genotoxic – Causing direct damage to genetic material. Associated with carcinogenicity.

Geometric mean – The measure of an average value often applied to numbers for which a log normal distribution is assumed.

Gestation – The period between conception and birth; in humans, the period known as pregnancy.

GRAS – generally recognized as safe. A phrase applied to food additives approved by the FDA.

Groundwater – the supply of fresh water found beneath the Earth's surface, usually in aquifers, which is often used for supplying wells and springs.

Habitat – The place where a population (e.g., human, animal, plant, microorganism) lives and its surroundings, both living and non-living.

Halftime or half-life – For compounds that are eliminated by first-order kinetics, the time required for the concentration of the chemical to decrease by one-half.

Hazard quotient (HQ) – The ratio of the estimated level of exposure to the RfD or some other index of acceptable exposure.

Hazard identification – The process of identifying the array of potential effects that an agent may induce in an exposed human population.

Health Advisory Level – A non-regulatory health-based reference level of chemical traces (usually in ppm) in drinking water at which there are no adverse health risks when ingested over various periods of time. Such levels are established for one day, 10 days, long-term and life-time exposure periods. They contain a wide margin of safety.

Hematological – Pertaining to the blood.

Hematology – One or more measurements regarding the state or quality of the blood.

Hematuria – blood in the urine.

Hemolytic anemia – A medical condition in which the number of red blood cells is decreased due to intravascular fragmentation or destruction.

Henry's law constant – An index of the tendency of a compound to dissolve in and/or volatilize from aqueous solutions.

Herbaceous – A plant that does not develop persistent woody tissue above the ground (annual, biennial, or perennial, but whose aerial portion naturally dies back to the ground at the end of a growing season. They include such categories as grasses and grass-like vegetation.

Herbicide – A chemical used to control, suppress, or kill plants, or to severely interrupt their normal growth processes.

Herbivore – an animal that feeds on plants.

Heterotroph – Bacteria and other microorganisms that use organic matter synthesized by other organisms for energy and growth.

Histology – The study of the structure of cells and tissues; usually involves microscopic examination of tissue slices.

Histopathology – Signs of tissue damage that can be observed only by microscopic examination.

Humus – Organic portion of the soil remaining after prolonged microbial decomposition.

Hydrolysis – Decomposition or alteration of a chemical substance by water.

Hydrogeology – The geology of ground water, with particular emphasis on the chemistry and movement of water.

Hydroxylation – The addition of a hydrogen-oxygen or hydroxy (-OH) group to one of the rings. Hydroxylation increases the water solubility of aromatic compounds. Particularly when followed by conjugation with other water soluble compounds in the body, such as sugars or amino acids, hydroxylation greatly facilitates the elimination of the compound in the urine or bile.

Hydrophilic – having an affinity for water. Its opposite, non- water-wettable, is hydrophobic

Hydroxyl – the anion of water or OH⁻, also present in all hydroxides.

Hypolimnion – Bottom waters of a thermally stratified lake. The hypolimnion of a eutrophic lake is usually low or lacking in oxygen.

Hypoxic – A condition of low oxygen concentration.

In situ – The original location in the body or environment.

In vivo – Occurring in the living organism.

In vitro – Isolated from the living organism and artificially maintained, as in a test tube.

Indigenous – Living or occurring naturally in a specific area or environment; native.

Inerts – anything other than the active ingredient in a product; not having active properties. Inert ingredients may be hazardous

Ingestion – the taking in of a substance through the mouth for digestion.

Internal Dose – In exposure assessment, the amount of a substance penetrating the absorption barriers (e.g. skin, lung tissue, gastrointestinal tract) of an organism through either physical or biological processes.

Interpolation – The use of mathematical models within the range of observations

Intraperitoneal – Injection into the abdominal cavity.

Invertebrate – An animal that does not have a spine (backbone).

Integrated Risk Information System (IRIS) – IRIS is an EPA data base containing verified RfDs and slope factors and up-to-date health risk and EPA regulatory information for numerous chemicals. Available at: <http://www.epa.gov/iriswebp/iris/index.html>.

Iritis – Inflammation of the iris, the circular pigmented membrane behind the cornea, perforated by the pupil.

Irreversible effect – Effect characterized by the inability of the body to partially or fully repair injury caused by a toxic agent.

Irritant – non-corrosive material that causes a reversible inflammatory effect on living tissue by chemical action at the site of contact as a function of concentration or duration of exposure

LC₅₀ – A calculated concentration of a chemical in air to which exposure for a specific length of time is expected to cause death in 50% of a defined experimental animal population.

LD₅₀ – The dose of a chemical calculated to cause death in 50% of a defined experimental animal population over a specified observation period. The observation period is typically 14 days.

Latency – Time from the first exposure to a chemical until the appearance of a toxic effect.

Leachate – Water that collects chemicals as it trickles through media containing the chemicals.

Leaching – the process by which nutrient chemicals or contaminants are dissolved and carried away by water, or are moved into a lower layer of soil.

Lesion – A pathological or traumatic discontinuity of tissue or loss of function of a part.

Level of Concern (LOC) – The concentration in media or some other estimate of exposure above which there may be effects.

Lethargy – sluggish behavior. Less than typical activity.

Lipophilic – having an affinity for oil or fat. The opposite of hydrophilic (i.e., hydrophobic).

Littoral zone – 1). That portion of a body of fresh water extending from the shoreline lakeward to the limit of occupancy of rooted plants. 2). The strip of land along the shoreline between the high and low water levels.

Lowest-observed-adverse-effect level (LOAEL) – The lowest dose of a chemical in a study, or group of studies, that produces statistically or biologically significant increases in frequency or severity of adverse effects between the exposed population and its appropriate control.

Lymphatic – Pertaining to lymph, a lymph vessel, or a lymph node.

Lymph – A clear water fluid containing white blood cells. Lymph circulates throughout the lymphatic system, removing bacteria and certain proteins from body tissue. It also is responsible for transporting fat from the small intestine and supplying mature lymphocytes to the blood.

Macrophyte – terrestrial or aquatic plant that is large enough to be seen without the aid of a microscope.

macroscopic organisms – Organisms big enough to be seen by the eye without the aid of a microscope.

Malignant – Cancerous.

Margin of safety (MOS) – The ratio between an effect or no effect level in an animal and the estimated human dose.

Margin of Exposure (MOE) – The ratio of the no-observed adverse-effect-level to the estimated exposure dose.

Marsh – A type of wetland that does not accumulate appreciable peat deposits and is dominated by herbaceous vegetation. Marshes may be either fresh or saltwater, tidal or non-tidal.

Material safety data sheet (MSDS) – a compilation of information required under the OSHA Communication Standard on the identity of hazardous chemicals, health, and physical hazards, exposure limits, and precautions. Section 311 of SARA requires facilities to submit MSDSs under certain circumstances.

Maximally (or Most) Exposed Individual – The person with the highest exposure in a given population.

Maximum Acceptable Toxic Concentration – For a given ecological effects test, the range (or geometric mean) between the No Observable Adverse Effect Level and the Lowest Observable Adverse Effects Level.

Maximum Tolerated Dose – The maximum dose that an animal species can tolerate for a major portion of its lifetime without significant impairment or toxic effect other than carcinogenicity.

Media – Specific environments such as air, water, soil, animal or plant matter.

Mesotrophic – Reservoirs and lakes which contain moderate quantities of nutrients and are moderately productive in terms of aquatic animal and plant life.

Methemoglobinemia – the presence of methemoglobin in the bloodstream caused by the reaction of materials with the hemoglobin in red blood cells that reduces their oxygen-carrying capacity. Methemoglobin is a soluble, brown, crystalline blood pigment that differs from hemoglobin in that it contains ferric iron and is unable to combine reversibly with molecular oxygen.

Metabolism – The sum of the chemical reactions occurring within a cell or a whole organism; includes the energy-releasing breakdown of molecules (catabolism) and the synthesis of new molecules (anabolism).

Metabolite – A compound formed as a result of the metabolism or biochemical change of another compound.

Metameter – Literally, the unit of measure. Used in dose-response or exposure assessments to describe the most relevant way of expressing dose or exposure.

Microcosm – A diminutive, representative system analogous to a larger system in composition, development, or configuration.

Microorganisms – A generic term for all organisms consisting only of a single cell, such as bacteria, viruses, and fungi.

Microsomal – Pertaining to portions of cell preparations commonly associated with the oxidative metabolism of chemicals.

Mineralization – The release of inorganic chemicals from organic matter in the process of aerobic or anaerobic decay – i.e., typically used as an expression of complete degradation.

Minimal risk level (MRL) – A route-specific (oral or inhalation) and duration-specific estimate of an exposure level that is not likely to be associated with adverse effects in the general population, including sensitive subgroups.

Mitigation – Measures taken to reduce adverse effects on the environment.

Mitochondria – Subcellular organelles involved in the conversion of food to stored chemical energy.

Modeling – Use of mathematical equations to simulate and predict real events and processes.

Molecule – The smallest division of a compound that still retains or exhibits all the properties of the substance.

Morbidity – Rate of disease, injury or illness.

Most sensitive effect – The adverse effect observed at the lowest dose level, given the available data. This is an important concept in risk assessment because, by definition, if the most sensitive effect is prevented, no other effects will develop. Thus, RfDs and other similar values are normally based on doses at which the most sensitive effect is not likely to develop.

Motile – Capable of self-propelled movement. A term that is sometimes used to distinguish between certain types of organisms found in water.

Mucous membrane – the mucous-secreting membrane lining the hollow organs of the body; i.e., nose, mouth, stomach, intestine, bronchial tubes, and urinary tract.

Multiple chemical sensitivity – A syndrome that affects individuals who are extremely sensitive to chemicals at extremely low levels of exposure.

Mutagenicity – The ability to cause genetic damage (that is damage to DNA or RNA). A mutagen is substance that causes mutations. A mutation is change in the genetic material in a body cell. Mutations can lead to birth defects, miscarriages, or cancer.

Narcosis – stupor or unconsciousness often produced by exposure to organic chemicals.

National Pollutant Discharge Elimination System (NPDES) – 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 EPA, a state, or, where delegated, a tribal government on an Indian reservation.

Necrosis – Death of plant or animal cells or tissues. In plants, necrosis can discolor stems or leaves or kill a plant entirely. In animals, necrosis can be minimal (focal or diffuse) or massive – i.e., resulting in loss of organ function that can sometimes lead to death of the organism.

Nematodes – Roundworms, some of which are pathogenic for plants and sometimes animals.

NEPA – National Environmental Policy Act.

Neurotoxin – a material that affects the nerve cells and may produce muscular, locomotor, emotional, behavioral abnormalities, and other physiologic changes.

Neutral – in pH terms, 7; neither acid nor basic.

Nitrification – the process whereby ammonia in soil or water is oxidized to nitrite and then to nitrate by bacterial or chemical reactions.

Nitrogen fixation – The biological or chemical process by which elemental nitrogen, from the air, is converted to organic or available nitrogen.

Non-target – Any plant or animal that a treatment inadvertently or unavoidably harms.

No-observed-adverse-effect level (NOAEL) – The dose of a chemical at which no statistically or biologically significant increases in frequency or severity of adverse effects were observed between the exposed population and its appropriate control. Effects may be produced at this dose, but they are not considered to be adverse.

No-Observed-Effect-Level (NOEL) – Exposure level at which there are no statistically or biologically significant differences in the frequency or severity of any effect between the exposed or control populations.

Normal distribution – One of several standard patterns used in statistics to describe the way in which variability occurs in a populations.

Nutrients – elements or compounds essential to growth and development of living things; carbon, oxygen, nitrogen, potassium and phosphorus.

Octanol-water partition coefficient (K_{ow}) – The equilibrium ratio of the concentrations of a chemical in n-octanol and water, in dilute solution.

Ocular – Pertaining to the eye.

OECD Guidelines – Testing guidelines prepared by the Organization of Economic and Cooperative Development of the United Nations. They assist in preparation of protocols for studies of toxicology, environmental fate, etc.

Oligotrophic – a term applied to describe deep clear lakes with low nutrient supplies. They contain little organic matter and have a high dissolved oxygen level.

Oliguria – scanty or low volume of urine.

Oral Toxicity – Ability of a pesticide to cause injury when ingested.

Organic matter – carbonaceous material contained in soil, plants or animal matter.

Organism – any living thing.

Parameter – a quantitative measure that is estimated by a model for a particular set of data.

Parenteral – Any form of injection.

Partition – In chemistry, the process by which a compound or mixture moves between two or more media.

Partition Coefficient – The ratio of concentrations of a chemical in two different media at equilibrium – e.g., octanol/water.

Pathogen – A living organism that causes disease; for example, a fungus or bacteria.

Pathway – In metabolism, a sequence of metabolic reactions.

Peak Levels – Maximum levels of a compound occurring for short periods of time in response to sudden events.

Percolation – downward flow or filtering of water through pores or spaces in rock or soil.

Perennial – A plant species having a life span of more than 2 years.

Periphyton – Microscopic plants and animals that are firmly attached to solid surfaces under water such as rocks, logs, pilings and other structures.

Permeability – The property or condition of being permeable. In this risk assessment, dermal permeability refers to the degree to which a chemical or herbicide in contact with the skin is able to penetrate the skin.

Persistence – refers to the length of time a compound, once introduced into the environment, stays there.

Personal Protective Equipment (PPE) – Clothing and equipment worn by pesticide mixers, loaders and applicators and re-entry workers, hazmat emergency responders, workers cleaning up Superfund sites, et. al., which is worn to reduce their exposure to potentially hazardous chemicals and other pollutants.

Pest – An insect, rodent, nematode, fungus, weed or other form of terrestrial or aquatic plant or animal life that is classified as undesirable because it is injurious to health or the environment.

Pesticide tolerance – the amount of pesticide residue allowed by law to remain in or on a harvested crop. By using various safety factors, EPA sets these levels well below the point where the chemicals might be harmful to consumers.

pH – The negative log of the hydrogen ion concentration. A high pH (>7) is alkaline or basic and a low pH (<7) is acidic.

Pharmacokinetics – The quantitative study of metabolism (i.e., the processes of absorption, distribution, biotransformation, elimination).

pKa – The negative log of the hydrogen ion concentration or pH at which 50% of a weak acid is dissociated.

Photosynthesis – the manufacture by plants of carbohydrates and oxygen from carbon dioxide and water in the presence of chlorophyll, using sunlight as an energy source.

Phytoplankton – that portion of the plankton community – i.e., organisms in water – comprised of tiny plants, e.g., algae, diatoms.

Phytotoxic – something that harms plants.

Plankton – small organisms with limited powers of locomotion, carried by water currents from place to place.

Porosity – Degree to which soil, gravel, sediment or rock is permeated with pores or cavities through which water or air can move.

Portal-of-Entry Effect – A local effect produced in the tissue or organ of first contact between a toxicant and the biological system.

Population – A group of interbreeding organisms occupying a particular space; the number of humans or other living creatures in a designated area.

Population at Risk – A population subgroup that is more likely to be exposed to a chemical, or is more sensitive to the chemical, than is the general population.

Porosity – Degree to which soil, gravel, sediment, or rock is permeated with pores or cavities through which water or air can move.

Potable Water – Water that is safe for drinking and cooking.

Potentiation – The ability of one chemical to increase the effect of another chemical.

Precautionary Principle – When information about potential risks is incomplete, basing decisions about the best ways to manage or reduce risks on a preference for avoiding unnecessary health risks instead of on unnecessary economic expenditures.

Predation – The act or practice of capturing another creature (prey) as a means for securing food.

Prokaryote – A cellular organism in which the nucleus has no limiting membrane.

Protozoa – Single-celled, eukaryotic microorganisms without cell walls. Most protozoa are free-living although many are parasitic. The majority of protozoa are aerobic or facultatively anaerobic heterotrophs.

Prospective – Looking ahead. In epidemiology, referring to a study in which the populations for study are identified prior to exposure to a presumptive toxic agent, in contrast to a retrospective study.

Protinated – an acid (A-) that is combined with a proton (H+) and has a neutral charge (AH). The dissociated form of the acid has a negative charge (A-)

Prudent industrial hygiene – precautionary measures taken to maintain good health when exposed to potentially harmful materials. This includes keeping hands, other parts of the body, work clothing, and equipment free of a material's residue, as well as not eating, drinking, applying makeup, or using toilet facilities where it is in use.

Pulmonary edema – fluid in the lungs.

Pup – The offspring or young of various animal species.

Receiving waters – All distinct bodies of water that receive runoff or wastewater discharges, such as streams, rivers, ponds, lakes, and estuaries.

Receptor – Ecological entity exposed to a stressor.

Record of Decision (ROD) – A public document that explains which alternative(s) will be used at a site.

Release – A work done to free desirable trees from competition with overstory trees, less desirable trees or grasses, and other forms of vegetative growth.

Reference Dose (RfD) – The RfD is a numerical estimate of a daily oral exposure to the human population, including sensitive subgroups such as children, that is not likely to cause harmful effects during a lifetime. RfDs are generally used for health effects that are thought to have a threshold or low dose limit for producing effects.

Registration – Formal listing with EPA of a new pesticide before it can be sold or distributed. Under the Federal Insecticide, Fungicide, and Rodenticide Act, EPA is responsible for registration (pre-market licensing) of pesticides on the basis of data demonstrating no unreasonable adverse effects on human health or the environment when applied according to approved label directions.

Relative weight – The weight of an organ, such as the liver or kidney, divided by the total body weight of the animal.

Reproductive effects – Adverse effects on the reproductive system that may result from exposure to a chemical or biological agent. The toxicity of the agents may be directed to the reproductive organs or the related endocrine system. The manifestations of these effects may be noted as alterations in sexual behavior, fertility, pregnancy outcomes, or modifications in other functions dependent on the integrity of this system.

Reregistration – the reevaluation and relicensing of existing pesticides originally registered prior to current scientific and regulatory standards. EPA re-registers pesticides through its Registration Standards Program.

Resorption – Removal by absorption. Often used in describing the unsuccessful development and subsequent removal of post-implantation embryos.

Retrospective – Looking behind. In epidemiology, referring to a study in which the populations for study are identified after exposure to a presumptive toxic agent, in contrast to a prospective study.

Reversible – Not permanent, applied especially adverse effects which diminish when exposure to a toxic chemical ends.

RfD – A daily dose which is not anticipated to cause any adverse effects in a human population over a lifetime of exposure. These values are derived by the U.S. EPA.

Right-of-way – A corridor of low growing shrubs or grasses that facilitate the maintenance and protection of utility power lines and provide transport pathways for humans or wildlife.

Riparian habitat – areas adjacent to rivers and streams that have a high density, diversity, and productivity of plant and animal species relative to nearby uplands.

Risk assessment – 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 pollutants.

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.

River basin – the land area drained by a river and its tributaries.

Rough Fish – Fish not prized for sport or eating, such as gar and suckers. Most are more tolerant of changing environmental conditions than are game or food species.

Route of exposure – The way in which a chemical or biological agent enters the body. Most typical routes include oral (eating or drinking), dermal (contact of the agent with the skin), and inhalation.

Run-off – That part of precipitation, snow melt, or irrigation water that runs off the land into streams or other surface water.

SARA – Superfund Amendments and Reauthorization Act (1986); federal law reauthorizing and expanding the jurisdiction of CERCLA. Signed into law October 17, 1986. Title III of SARA is known as the Emergency Planning and Community Right-to-Know Act of 1986. It is a revision and extension of CERCLA.

Saturated zone – a subsurface area in which all pores and cracks are filled with water under pressure equal to or greater than that of the atmosphere.

Scientific notation – The method of expressing quantities as the product of number between 1 and 10 multiplied by 10 raised to some power. For example, in scientific notation, 1 kg = 1,000 g would be expressed as $1 \text{ kg} = 1 \times 10^3 \text{ g}$ and 1 mg = 0.001 would be expressed as $1 \text{ mg} = 1 \times 10^{-3}$.

Sediment – soil, sand, and minerals washed from land into water usually after rain.

Sensitive subgroup – Subpopulations that are much more sensitive than the general public to certain agents in the environment.

Sensitization – A condition in which one is or becomes hypersensitive or reactive to an agent through repeated exposure.

Signal Words – The words used on a pesticide label--Danger, Warning, Caution--to indicate level of toxicity.

Silt – Sedimentary materials composed of fine or intermediate sized mineral particles.

Silviculture – Management of forest land for timber.

Sink – Place in the environment where a compound or material collects.

Site preparation – The removal of competition and conditioning of the soil to enhance the survival and growth of seedlings or to enhance the seed germination.

Special Review – Formerly known as Rebuttable Presumption Against Registration (RPAR), this is the regulatory process through which existing pesticides suspected of posing unreasonable risks to human health, non-target organisms, or the environment are referred for review by EPA. Such review requires an intensive risk/benefit analysis with opportunity for public comment. If risk is found to outweigh social and economic benefits, regulatory actions can be initiated, ranging from label revisions and use-restriction to cancellation or suspended registration.

Species-to-species extrapolation – A method involving the use of exposure data on one species (usually an experimental mammal) to estimate the effects of exposure in another species (usually humans).

Stokes' law – an expression for calculating the rate of fall of particles through a air or a fluid based on densities, viscosity, and particle size.

Subchronic exposure – An exposure duration that can last for different periods of time (5 to 90 days), but 90 days is the most common test duration for mammals. The subchronic study is usually performed in two species (rat and dog) by the route of intended use or exposure.

Subcutaneous – beneath the skin.

Submerged Aquatic Vegetation – Vegetation that lives at or below the water surface; an important habitat for young fish and other aquatic organisms.

Substrate – With reference to enzymes, the chemical that the enzyme acts upon.

Surface water – all water naturally open to the atmosphere (rivers, lakes, reservoirs, streams, impoundments, seas, estuaries, etc.) and all springs, wells, or other collectors which are directly influenced by surface water.

Surfactant – a surface active agent; usually an organic compound whose molecules contain a hydrophilic group at one end and a lipophilic group at the other. Promotes solubility or lathering.

Synergistic effect – A situation in which the combined effects of two chemicals is much greater than the sum of the effect of each agent given alone.

Systemic effects – Effects observed at sites distant from the entry point of a chemical due to its absorption and distribution into the body.

Systemic toxicity – Effects that require absorption and distribution of a toxic agent to a site distant from its entry point at which point effects are produced. Systemic effects are the obverse of local effects.

Tachycardia – excessively rapid heartbeat.

Tachypnea – increased rate of respiration.

Teratogenic – Causing structural defects that affect the development of an organism; causing birth defects.

Teratology – The study of malformations induced during development from conception to birth.

Terrestrial – Anything that lives on land as opposed to living in an aquatic environment.

Threshold – The maximum dose or concentration level of a chemical or biological agent that will not cause an effect in the organism.

Threshold Limit Value (TLV) – The concentration of an airborne substance to which an average person can be repeatedly exposed without adverse effects. TLVs may be expressed in three ways – (1) TLV-TWA--Time weighted average, based on an allowable exposure averaged over a normal 8-hour workday or 40-hour work-week; (2) TLV-STEL--Short-term exposure limit or maximum concentration for a brief specified period of time, depending on a specific chemical (TWA must still be met); and (3) TLV-C--Ceiling Exposure Limit or maximum exposure concentration not to be exceeded under any circumstances. (TWA must still be met.)

Thymus – A small gland that is the site of T-cell production. The gland is composed largely of lymphatic tissue and is situated behind the breastbone. The gland plays an important role in the human immune system.

Time-weighted average (TWA) – The average air concentration of material during a given period.

Tolerances – Permissible residue levels for pesticides in raw agricultural produce and processed foods. Whenever a pesticide is registered for use on a food or a feed crop, a tolerance (or exemption from the tolerance requirement) must be established. EPA establishes the tolerance levels, which are enforced by the Food and Drug Administration and the Department of Agriculture.

Toxicity – The inherent ability of an agent to affect living organisms adversely. As defined by U.S. EPA, toxicity is “...the degree to which a substance or mixture of substances can harm humans or animals. Acute toxicity involves harmful effects in an organism through a single or short-term exposure. Chronic toxicity is the ability of a substance or mixture of substances to cause harmful effects over an extended period, usually upon repeated or continuous exposure sometimes lasting for the entire life of the exposed organism. Subchronic toxicity is the ability of the substance to cause effects for more than one year but less than the lifetime of the exposed organism.” This definition appears to apply to mammals rather than short-lived organisms.

Toxicology – the study of the nature, effects, and detection of poisons in living organisms. Also, substances that are otherwise harmless but prove toxic under particular conditions. The basic assumption of toxicology is that there is a relationship among the dose (amount), the concentration at the affected site, and the resulting effects.

Transpiration – The process by which water vapor is lost to the atmosphere from living plants.

Uncertainty factor (UF) – A factor used in operationally deriving the RfD and similar values from experimental data. UFs are intended to account for (1) the variation in sensitivity among members of the human population; (2) the uncertainty in extrapolating animal data to the case of humans; (3) the uncertainty in extrapolating from data obtained in a study that is less than lifetime exposure; and (4) the uncertainty in using LOAEL data rather than NOAEL data. Usually each of these factors is set equal to 10.

Unsaturated – In terms of molecular structure, a carbon atom in a hydrocarbon molecule that shares a double bond with another carbon atom.

Unsaturated zone – the area above the water table where the soil pores are not fully saturated, although some water may be present.

Vadose zone – The area between land surface and the water table within which the moisture content is less generally (i.e., except at the capillary fringe) than saturation and pressure is less than atmospheric. Soil pore spaces also typically contain air or other gases. The capillary fringe is included in the vadose zone.

Vehicle – A substance (usually a liquid) used as a medium for suspending or dissolving the active ingredient. Commonly used vehicles include water, acetone, and corn oil.

Vertebrate – An animal that has a spinal column (backbone).

Volatile – Referring to compounds or substances that have a tendency to vaporize. A material that will evaporate quickly.

Water Table – The level of groundwater.

Watershed – the land area that drains into a stream.

Weak acid – an acid that is not substantially dissociated at a neutral pH. Many herbicides as well as many naturally occurring organic chemicals are weak acids. Mammals have well developed systems to excrete weak acids.

Wetlands – an area that is regularly saturated by surface or ground water and subsequently is characterized by a prevalence of vegetation that is adapted for life in saturated soil conditions. Examples include swamps, bogs, fens, marshes, and estuaries.

Xenobiotic – term for non-naturally occurring or man-made substances found in the environment.

Zooplankton – tiny aquatic animals that consume aquatic vegetation or microorganisms and that in turn serve as a source of food for fish or other zooplankton.