

UNITED STATES DEPARTMENT OF THE  
INTERIOR

NATIONAL IRRIGATION WATER  
QUALITY PROGRAM  
INFORMATION REPORT NO. 3

**Guidelines for Interpretation  
of the Biological Effects of  
Selected Constituents in  
Biota, Water, and Sediment**

**Appendix 2**

*Participating Agencies:*

Bureau of Reclamation  
U.S. Fish and Wildlife Service  
U.S. Geological Survey  
Bureau of Indian Affairs

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## Appendix II

### Glossary of Abbreviations and Technical Terms

#### A

**abiotic:** Not involving living organisms or life processes.

**absorption:** Taking in of fluids or other substances by cells or tissues (cf. *adsorption*).

**acclimation:** Physiological and behavioral adjustments of an organism to changes in its environment (especially changes that occur within single individuals and single generations; cf. *adaptation*).

**action levels:** Limits established by the U.S. Food and Drug Administration (FDA) to control levels of contaminants in human food and animal feed. The FDA will take legal action to remove products from the market if they exceed these limits.

**acute exposure:** A single exposure to a toxic substance which results in severe biological harm. Acute exposures are usually characterized as lasting no longer than a day.

**adaptation:** Changes in an organism's structure or habits that help it adjust to its surroundings (especially changes that occur through natural selection over multiple generations; cf. *acclimation*).

**adipose:** Fatty; of or relating to fat.

**adsorption:** The adherence of a gas, liquid, or dissolved material on the surface of a solid. Should not be confused with absorption.

**aerobic:** Living or existing in the presence of oxygen.

**albumen:** The white of an egg.

**alevin:** A young fish which has not yet absorbed its yolk sac.

**algicide:** A chemical that kills algae.

**amalgam:** An alloy of mercury.

**ambient:** Surrounding natural conditions (or environment) in a given place and time.

**amphipod:** A small crustacean of the order Amphipoda, such as a beach flea. Amphipods lack eye stalks, have little or no shell, and have laterally compressed bodies.

**anadromous:** Fish that migrate from salt water to freshwater to breed.

**anaerobic:** Living or existing in the absence of oxygen.

**anatid:** Any member of the Anatidae, an order of waterfowl that includes ducks, geese, mergansers, and swans.

**Anseriformes:** An order of waterfowl comprising the ducks, geese, swans, mergansers, and screamers.

**antagonism:** Interference or inhibition of the effect of one chemical by the action of another chemical.

**aquo ion:** An ion that incorporates water molecules. Most metallic ions, if dissolved in water, form a complex with six water molecules, resulting in an aquo ion with the same charge as the free metallic ion.  $Pb^{2+}$ , for instance, is really  $[Pb(H_2O)_6]^{2+}$ .

**Arochlor:** A clear, colorless to pale-yellow, viscous organic liquid consisting of a mixture of polychlorinated biphenyls (PCBs). It is widely used in electrical components, vacuum pumps, gas-transmission turbines, heat-exchange fluids, coatings, inks, insecticides, fillers, adhesives, paints, and duplicating papers. It is a common environmental contaminant.

**arsenical:** (1) Containing or relating to arsenic. (2) An arsenic compound.

**arthropod:** Any member of the phylum Arthropoda, which includes insects, crustaceans, arachnids, millipedes, and centipedes.

**articular gout:** Swelling around the joints caused by accumulation of urates (uric acid salts).

**As:** Chemical symbol for arsenic.

**athalassohaline:** Refers to a nonmarine saline environment. Nonmarine salinity is far more variable than the salinity in seawater, but it generally includes much less sodium chloride and higher proportions of other salts, such as calcium and magnesium sulfides.

**avian:** In, of, or related to birds.

**AVS:** Acid-volatile sulfide. Sulfide ions in sediment that are extractable by cold hydrochloric acid. These form insoluble and, hence, nontoxic compounds with metals. Therefore, metal toxicity is reduced, ion for ion, by the amount of AVS in the sediment.

**AWQC:** Ambient water quality criteria (established by U.S. Environmental Protection Agency).

## B

**B:** Chemical symbol for boron.

**basophilic granules:** Bodies from a cell's cytoplasm that take up basic dyes when stained in preparation for microscopic examination. The dyes give them a blue, gray, or bluish-gray color under the microscope.

**BCF:** Bioconcentration factor, the concentration of a chemical in biota (e.g., earthworm) divided by the concentration of the chemical in media (e.g., soil).

**benthic organism:** Plant or animal that lives on or near the bottom of a stream, lake, or sea.

**bioaccumulation:** General term for the uptake and storage of chemical constituents by plants and animals.

**bioassay:** Determination of the potency of a chemical by comparing its effect on an organism to the effect of a standard preparation on the same type of organism (cf. *toxicity test*).

**bioavailability:** The extent to which a substance is capable of entering into biological metabolism.

**bioconcentration:** The accumulation of a chemical in tissues of an organism (such as fish) to levels that are greater than the level in the organism's food or in its environment.

**biomagnification:** The cumulative result of bioconcentration as a chemical passes up the food chain, becoming progressively more concentrated at each trophic level.

**biomonitor:** An organism sensitive to changes in water quality, which is kept under observation in order to detect such changes promptly.

**biota:** Plant and animal life.

**biotransformation:** The chemical alteration of a compound caused by enzymatic activity within an organism.

**bivalent:** Capable of forming single bonds with two other atoms or a double bond with one other atom.

**bw:** Body weight.

## C

**C:** Chemical symbol for carbon.

**Ca:** Chemical symbol for calcium.

**cachexia:** Severe weight loss and general wasting of the body.

**calcium carbonate (CaCO<sub>3</sub>) equivalent:** An expression of the concentration of specified constituents in water in terms of their equivalent value to calcium carbonate. For example, water hardness is usually described as calcium carbonate equivalent.

**carcinogen:** Any substance that tends to produce cancer in an organism.

**centrarchid:** Any fish from the family Centrarchidae, which includes the freshwater or black basses and several sunfishes.

**cerebellum:** A part of the brain lying below the cerebrum, consisting of three lobes and concerned with muscular coordination and maintenance of equilibrium.

**Charadriiformes:** An order of birds including the auks, gulls, snipes, and other shorebirds.

**chelation:** Process by which a metallic ion bonds to a complex molecule at two different points, which creates a ring structure and greatly reduces the chemical reactivity of the metallic ion but greatly increases its solubility.

**chironomid:** Members of the family Chironomidae (the true midges), two-winged flying insects which live their larval stage underwater.

**chlorohydrocarbons:** A class of persistent, broad-spectrum insecticides that linger in the environment and accumulate in the food chain. Among them are DDT, aldrin, dieldrin, heptachlor, chlordane, lindane, endrin, mirex, hexachloride, and toxaphene.

**chlorosis:** Yellowing of leaves and stems of green plants, caused by a loss of chlorophyll and other green pigments.

**chronic exposure:** Long-term, low-level exposure to a toxic chemical.

**Cl:** Chemical symbol for chlorine.

**Cladocera:** An order of small, freshwater branchiopod crustaceans having a transparent bivalve shell. Also called "water fleas."

**conductance:** The capacity of a medium to carry an electrical current. In water, conductance is directly related to the concentration of ionized substances and, hence, a conductance test serves as a rapid method of estimating the water's dissolved solids content (salinity).

**contaminant:** Any physical, chemical, biological, or radiological substance or matter that has an adverse effect on air, water, soil, or living things.

**criterion (plural: criteria):** An estimate of the concentration of a chemical or the magnitude of a physical property that will preserve an organism or group of organisms from harm if not exceeded. Criteria are not standards but may serve as the basis for standards. Under the Clean Water Act, each State is required to set up enforceable water quality standards that are at least as protective as the Environmental Protection Agency's criteria.

**crust (of Earth):** Rocks and soil close to the surface of the Earth. The crust is generally considered to extend 20–50 kilometers below the continents and 5–10 kilometers below the ocean floor.

**crustal abundance:** Estimated average abundance of an element in the crust of the Earth.

**Cu:** Chemical symbol for copper.

**cyanobacteria:** Blue-green algae.

**cytoplasm:** All of the fluids and microscopic bodies (organelles) that make up the contents of a living cell, except for the nucleus.

**cytoplasmic oxyphilia:** A condition of living cells in which the cytoplasm contains an unusual excess of bodies that take up acidic dyes when stained in preparation for microscopic examination.

## D

**d:** Days.

**daphnid:** A water flea, particularly one of *Daphnia* or a related genus. A cladoceran.

**DDD:** A common metabolite of DDT. Chemical name: dichlorodiphenyl-dichloroethane or 2,2-*bis*(*p*-chlorophenyl)-1,1-dichloroethane. CAS No. 72–54–8.

**DDE:** A common metabolite of DDT. Chemical name: dichlorodiphenyl-dichloroethene or 2,2-*bis*(*p*-chlorophenyl)-1,1-dichloroethene, CAS No. 72–55–9.

**DDT:** The first chlorinated hydrocarbon insecticide banned in the United States since 1972 because of its persistence in the environment and its accumulation in the food chain. Chemical name: dichlorodiphenyl-trichloroethane or 2,2-*bis*(*p*-chlorophenyl)-1,1,1-trichloroethane. CAS No. 50–29–3.

**defoliant:** An herbicide that removes leaves from trees and growing plants.

**demethylation:** Loss or removal of the methyl group (CH<sub>3</sub>) from a methylated compound.

**demyelination:** Destruction or loss of myelin—a soft, white fatty substance that forms a sheath around certain nerve fibers.

**dermatosis:** General term for a disease of the skin.

**dicofol:** Organochlorine pesticide that often has a trace of DDT contamination. Commonly used on citrus fruits and cotton. Also known as Kelthane®. Chemical name: dichlorodiphenyltrichloroethanol.

**dicotyledon:** Any plant of the class Dicotyledonae (or Magnoliopsida), which includes most broad-leafed flowering plants and trees.

**dry weight:** Weight determined after water and other volatile liquids have been driven off by heating or by prolonged exposure to dry air.

**dw:** Dry weight.

**DWEL:** Drinking water equivalent level—a lifetime exposure concentration estimated to be safe from all toxic effects other than cancer. Calculated based on the assumption that all exposure to a contaminant is from drinking water.

## E

**EC50:** Median effective concentration; estimated concentration at which 50 percent of exposed specimens exhibit a particular effect. Similarly, “EC” may be used with other percentages to indicate concentrations for which the affected population is equal to those percentages.

**ecosystem:** Complex system composed of a community of animals and plants as well as the chemical and physical environment.

**ecotoxicity:** The harmful effect a substance may inflict on any part of an ecosystem.

**ED50:** Median effective dose; the dose estimated to produce a particular effect in 50 percent of the test specimens. Similarly, “ED” may be used with other percentages to indicate doses for which the affected population is equal to those percentages.

**effluent:** An outflow, especially the partially or completely treated wastewater flowing out of a treatment facility, reservoir, or basin.

**embryopathic:** Having to do with malformations that are congenital but not necessarily hereditary.

**emergent plants:** Plants that are rooted underwater but rise above the water surface (e.g., cattails).

**endrin:** A pesticide toxic to freshwater and marine aquatic life that produces adverse health effects in domestic water supplies.

**EPA:** U.S. Environmental Protection Agency.

**Ephemeroptera:** An order of the class Insecta that includes all mayflies.

**ERL:** “Effects range-low” value of Long et al. (1995). Level at which 10 percent of test specimens show adverse effects.

**ERM:** “Effects range-median” value of Long et al. (1995). Level at which 50 percent of test specimens show adverse effects.

**estuarine:** In, of, or relating to an estuary.

**estuary:** A river mouth, particularly that portion subject to tidal action and fluctuating salinity.

**eutrophication:** The increase in the nutrient levels of a lake or other body of water; this usually promotes greater growth of aquatic animal and plant life.

**evapotranspiration:** The process by which water in the soil is drawn up through the roots of plants and then is transpired through the plants' leaves into the atmosphere.

## F

**Falconiformes:** An order of birds which includes all raptors except owls.

**fauna:** Animal life.

**fecundity:** Fertility; the capacity for producing offspring in abundance.

**fingerling:** (1) A young or small fish no larger than a human finger. (2) A life stage of fish from 2 weeks after absorption of the yolk sac up to 1 year of age.

**fledging:** Growing feathers.

**floating-leaf plants:** Plants that are rooted in the sediment on the bottom of a water body but have leaves that float on the surface (e.g., water lilies).

**flora:** Plant life.

**fresh weight:** Wet weight, as determined in the field or shortly after sample collection.

**fry:** Life stage of fish between the egg and fingerling stages. Depending on the species of fish, fry can measure from a few millimeters to a few centimeters.

**fungicide:** Pesticides used to control, deter, or destroy fungi.

**fw:** Fresh weight.

**fww:** Fresh wet weight.

## G

**g:** Grams.

**gastroschisis:** An opening or fissure in the ventral wall of the abdomen.

**germinal tissue:** Specialized reproductive tissue, such as egg or sperm cells.

## H

**H:** Chemical symbol for hydrogen.

**h:** Hours.

**HA:** A Drinking Water Health Advisory issued by the Environmental Protection Agency: a non-regulatory health-based reference level of chemical traces in drinking water at which there are no adverse health risks when ingested over various periods of time. (See separate definitions for 1-day, 10-day, long-term, and lifetime HAs.) HAs incorporate a large margin of safety.

**half-life:** The length of time required for the mass, concentration, or activity of a chemical or physical agent to be reduced by one-half.

**hardness, water:** The concentration in water of various mineral salts, primarily carbonates, bicarbonates, sulfates, chlorides, and nitrates of calcium and magnesium. Usually expressed as *calcium carbonate equivalent*. Hardness reduces the toxicity of copper, zinc, and some other contaminants.

**hectare:** A measure of area in the metric system similar to an acre. One hectare is equal to 10,000 square meters or 2.4711 acres.

**hepatic:** In, of, or related to the liver.

**hepatocellular hypertrophy:** Swelling of the cells of the liver.

**herbicide:** A chemical pesticide designed to control or destroy plants, weeds, or grasses.

**Hg:** Chemical symbol for mercury.

**histopathological:** Pertaining to or caused by diseases of bodily tissues.

**homeostatic:** Regulated internally as part of an animal's metabolism.

**hydrosol:** Nutrient-rich pore water within the bottom sediment of a water body.

## I

**IC50:** Inhibitory concentration estimated to reduce the normal response of an organism by 50 percent. Only quantifiable responses, such as growth rates, are expressed as IC values. Other percentage values may be used with "IC" to indicate greater or lesser amounts of inhibition.

**immunotoxicity:** Harmful effect of a substance to the immune system. Immunotoxins cause increased susceptibility to diseases.

**infauna:** Aquatic animals that live within rather than on the bottom sediment.

**inorganic:** Chemical substances of mineral origin, not of basically carbon structure.

**insecticide:** A compound specifically used to kill or prevent the growth of insects.

**insectivore:** An animal that subsists primarily on a diet of insects.

**instar:** Life stage of an insect or other arthropod between one molt and the next.

**invertebrates:** All animals that lack a vertebral column (e.g. insects, crustaceans, mollusks, worms).

**ion:** An atom or molecule that has acquired a net electrical charge through gaining or losing electrons.

**isocaloric:** Providing the same number of calories.

**isomers:** Chemical compounds that have identical atomic compositions but differ in structure.

## K

**keratin:** A tough, fibrous protein material, somewhat softer than bone, that makes up many semi-hard body parts, such as horns, nails, and feathers.

**keratinization:** Growth of keratin on skin or other soft tissues.

**kg:** Kilograms.

## L

**L:** Liter, 1,000 cubic centimeters. (1 L of fresh water normally weighs almost exactly 1 kilogram, which makes it possible to relate weight-per-volume measurements, such as micrograms per liter, to weight-per-weight measurements, such as micrograms per kilogram or parts per billion.)

**larid:** Any bird of the family Laridae, which includes gulls and terns, and is sometimes considered to include jaegers.

**LC50:** Median lethal concentration; estimated concentration at which 50 percent of exposed specimens would die. Similarly, "LC" may be used with other percentages to indicate concentrations that produce mortality rates equal to those percentages.

**LD50:** Median lethal dose; estimated dose sufficient to cause death to 50 percent of exposed specimens. Similarly, "LD" may be used with other percentages to indicate doses that produce mortality rates equal to those percentages.

**leachate:** The ground-water solution that results from leaching.

**leaching:** The dissolution and removal of soluble constituents from soil by water percolating through the soil.

**legume:** Any plant of the family Leguminosae, which includes peas, beans, clover, alfalfa, and other plants having seeds in bilaterally symmetrical pods.

**lesion:** Any alteration of tissue caused by injury or disease.

**level of concern:** Concentration of a toxic substance above which adverse effects may result from even brief exposure.

**lifetime exposure:** Total amount of exposure to a substance that a human would receive in a lifetime (usually assumed to be 70 years).

**lifetime HA:** The concentration of a chemical in drinking water that is not expected to cause any adverse noncarcinogenic effects over a lifetime of exposure, with a margin of safety.

**lipids:** Fats, fatty acids, waxes, and similar long-chain organic compounds (e.g., alcohols, amines, aldehydes), which make up a large proportion of every living cell.

**lipophilic:** Having an affinity for fats or other lipids. Also, promoting the dissolution of lipids.

**LOAEL** Lowest-observed-adverse-effect level; the lowest dose in an experiment which produced an observable adverse effect.

**long-term HA:** The concentration of a chemical in drinking water that is not expected to cause any adverse noncarcinogenic effects up to approximately 7 years (10 percent of an individual's lifetime) of exposure, with a margin of safety.

**lordosis:** Exaggerated forward curvature of the spine.

## M

**m:** Meters.

**macroalgae:** Free-floating water plants that are large enough to be seen with the naked eye.

**macroinvertebrate:** An invertebrate large enough to be seen with the naked eye.

**macrophyte:** A plant large enough to be seen with the naked eye.

**MATC:** Maximum allowable toxicant concentration.

**MCL:** Maximum contaminant level—the maximum permissible level of a contaminant in water delivered to any user of a public water system. MCLs are enforceable standards.

**MCLG:** Maximum contaminant level *goal*—the maximum level of a contaminant in drinking water at which no adverse health effects would be anticipated. MCLGs are nonenforceable health goals.

**MD25:** Dose or concentration that results in an adverse effect other than death to 25 percent of the test population. Similarly, MD may be used with other percentages to indicate doses that produce adverse effects in larger or smaller population segments.

**MeHg:** Methylmercury.

**meninges:** Membranes that cover the brain and spinal cord.

**metacarpals:** Five major bones in the upper part of the forefoot or the hand. (In humans, the metacarpals diverge outward from the “heel” of the hand toward each of the digits.)

**mercurial:** (1) Containing or related to mercury. (2) A mercury compound.

**mercuriferous:** Containing mercury.

**mesic:** Having moderate amounts of moisture; intermediate between humid and arid.

**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:** Any product of metabolism, especially a transformed chemical.

**metalloid:** A nonmetallic element that has some of the chemical properties of a metal.

**metallothionein:** A low-molecular-weight protein that binds and detoxifies divalent heavy metals, such as mercury, copper, and zinc. Some plants and animals synthesize metallothionein when exposed to heavy metals.

**methylation:** A chemical or biochemical reaction that adds a methyl group (CH<sub>3</sub>) to an element or molecule.

**methylmercury:** An organic ion (CH<sub>3</sub>Hg<sup>+</sup>) that represents the most toxic form of mercury generally found in the environment. Methylmercury enters into metabolism more readily than any of the inorganic forms.

**mg:** Milligrams.

**mg/kg:** Milligrams per kilogram, equivalent to parts per million.

**mg/L:** Milligrams per liter, essentially equivalent to parts per million in water.

**microinvertebrate:** An invertebrate too small to be seen by the naked eye.

**micromelia:** A condition characterized by undersized and/or deformed extremities.

**micronutrients:** Elements and compounds required by living organisms only in minute amounts.

**mine tailings:** Residue of low-grade material and waste discarded during the processing of mineral ores.

**Mo:** Chemical symbol for molybdenum.

**molybdenosis:** A disease of cattle and sheep caused by an excess of molybdenum in forage plants, which leads to copper deficiency because of molybdenum's ability to sequester copper. Common symptoms include loss of pigmentation in the hair or wool, diarrhea, anemia, poor growth, anorexia, and deformed offspring.

**monocotyledon:** Any plant of the class Monocotyledonae (or Liliopsida), which includes all of the grasses, lilies, orchids, and other flowering plants with narrow, parallel-veined leaves.

**monoclinic:** Describes mineral crystals having three axes of unequal length, two of which are perpendicular to the third but not perpendicular to each other.

**monogastric:** Having a single, undivided stomach (*cf. ruminant*).

**mutagen:** A chemical that induces genetic mutations.

## N

**NAWQ:** National ambient water quality criteria, issued by the Environmental Protection Agency.

**necrosis:** Death of cells or tissue. May result in spots or small discolored areas on leaves of a plant or on the skin of an animal.

**necrotic:** Affected by necrosis.

**neuron:** A nerve or brain cell.

**ng:** Nanogram (one-billionth of a gram).

**NOAEL:** No-observed-adverse-effect level—the highest tested concentration at which no adverse effect was observed.

## O

**O:** Chemical symbol for oxygen.

**octanol-water partition coefficient:** The ratio of a chemical's solubility in *n*-octanol (C<sub>8</sub>H<sub>17</sub>OH) to its solubility in water. Symbol: *K*<sub>ow</sub>. The ratio indicates the chemical's propensity for bioconcentration by aquatic organisms.

**Odonata:** An order of the class Insecta that includes all dragonflies and damselflies.

**oligochaete:** Worms of the class Oligochaeta, including the common earthworms.

**omnivore:** Animal that eats both vegetable and animal substances.

**one-day HA:** The concentration of a chemical in drinking water that is not expected to cause any adverse noncarcinogenic effects for up to 5 consecutive days of exposure, with a margin of safety.

**organic:** In general, produced by or having to do with living organisms. In chemistry, refers specifically to carbon and its many compounds.

**organochlorine:** Refers to any organic compound containing one or more chlorine atoms.

**organomercurial:** An organic compound containing mercury.

**organophosphate:** An organic compound containing phosphorus and oxygen in combination. Organophosphate pesticides are short-lived, but some can be toxic when first applied.

**orthorhombic:** Describes mineral crystals having three mutually perpendicular axes of symmetry, all of different lengths.

**ovalbumin:** The white of an egg.

**ovoglobulin:** Non-water-soluble simple proteins found in the yolk of an egg.

**oxidation state:** The effective ionic charge of an atom or compound which determines, among other things, which other atoms it may combine with and in what proportions.

## P

**particulates:** Very small solid particles suspended in water. They vary in size, shape, density, and electrical charge and can be gathered together by coagulation and flocculation.

**periphyton:** Organisms that live attached to underwater surfaces.

**pH:** A measurement of the acidity or alkalinity, based on the inverse logarithm of the concentration of hydrogen ions. On a scale from 0 to 14, 7 is considered exactly neutral, lower values are increasingly acidic, and higher values are increasingly alkaline or basic.

**phytoplankton:** The portion of the plankton community that consists of tiny plants, such as green algae and diatoms.

**piscivore:** An animal that subsists primarily on fish.

**planarian:** A type of flatworm common in aquatic environments.

**plankton:** Free-floating plants and animals that live near the surface of a body of water

**Plecoptera:** An order of insects commonly known as stoneflies.

**pM:** Picomoles, one-trillionth of a mole. One pM =  $6.02 \times 10^{11}$  molecules.

**porphyry deposit:** A low-grade mineral deposit in which the commodity of interest is concentrated in isolated crystals dispersed within a fine-grained rock.

**prepupation:** The stage in an insect's life cycle prior to formation of a pupa (such as a cocoon or chrysalis). Basically, the larval stage.

**Procellariiformes:** An order of sea birds including the albatrosses, petrels, and shearwaters.

**ppt:** Parts per thousand.

## R

**rallid:** Any member of the Rallidae, a family of birds that includes the rails and coots.

**raptor:** A bird of prey.

**recurvirostrid:** Any member of the Recurvirostridae, a family of birds that includes the stilts and avocets.

**RfD:** Reference dose—an estimate of a daily exposure to the human population that is likely to be without appreciable risk of deleterious effects over a lifetime.

**riparian:** Of, on, or pertaining to the bank of a river, pond, or lake.

**riverine:** Riparian; pertaining to a riverbank.

**rumen:** The first chamber in the stomach of a ruminant.

**ruminant** A mammal of the suborder Ruminantia, having a stomach subdivided into multiple (usually four) compartments, which chews a cud consisting of regurgitated, partially digested food. Ruminants are invariably hoofed, even-toed grazing animals, and most grow horns. Examples include cattle, sheep, goats, deer, camels, and giraffes.

## S

**salinity:** A measure of the concentration of dissolved mineral substances in water.

**salmonid:** Any fish belonging to the family Salmonidae, which includes trout, salmon, whitefish, and grayling.

**salt gland:** A compound tubular gland which secretes a watery, highly saline fluid. Located near the eyes and nasal passages of certain birds, snakes, and marine turtles.

**Se:** Chemical symbol for selenium.

**secondary maximum contaminant level:** Nonenforceable Environmental Protection Agency-recommended maximum concentration of a drinking water contaminant, based on considerations of odor, taste, and appearance, rather than any finding of toxicity

**seed dressing:** Any of various types of chemical coatings applied to seeds. Fungicides and insecticides are most common.

**seleniferous:** Containing selenium.

**selenosis:** Selenium poisoning.

**sink:** Any component in the natural cycle of an element or compound which takes that element or compound out of circulation.

**slimicide:** A chemical that prevents the growth of slime in paper stock.

**smolt:** A young salmon at the stage at which it migrates from freshwater to the sea.

**solubilization:** A process that makes a substance soluble or increases its solubility.

**sorption:** A general term referring to either absorption, adsorption, or a combination of the two.

**standard:** Legally enforceable limit on a constituent or condition (e.g., pH, cloudiness) in water or some other medium

**Storage ratio:** See BCF.

**Strigiformes:** An order of birds consisting of the owls.

**sublethal:** Having an effect less severe than death.

**Superfund:** Program administered by the Environmental Protection Agency that identifies high-priority pollution sites and oversees cleanup at such sites.

**supraorbital:** Situated or occurring above the eye socket.

**swim-up fry:** The stage at which young fish are able to swim up from the gravel bed in which they hatched.

**synergism:** An interaction of two or more chemicals which results in an effect that is greater than the sum of their effects taken independently.

## T

**TDS:** Total dissolved solids—total amount of dissolved material contained in water. Depending on analytical method, this may include only inorganic material or both organic and inorganic material.

**Technical grade DDT:** A mixture of DDT isomers, especially *p,p'*-DDT and *o,p'*-DDT; it is a cream-colored to gray powder with a faint fruitlike odor.

**Ten-day HA:** The concentration of a chemical in drinking water that is not expected to cause any adverse noncarcinogenic effects up to 14 consecutive days of exposure, with a margin of safety.

**teratogen:** A chemical that causes congenital malformations.

**teratogenesis:** The induction of congenital malformations (birth defects) in a developing fetus by a toxin acting inside the egg or the womb; interference with normal embryonic development.

**threshold:** The lowest dose of a chemical at which a specified measurable effect is observed and below which it is not observed.

**thymus:** A gland in the neck or chest of all vertebrates, most prominent in the early stages of life, which plays a role in regulating the supply of white blood cells.

**tile drainage:** Water drained from beneath a field by a system of pipes. (Originally, nearly all the pipes were tile, though now various materials are used.)

**tillering:** Production of new shoots (especially in grasses).

**total DDT:** DDT plus all metabolites.

**toxicity test:** A measure of the degree of response of an organism exposed to a particular concentration of a chemical or a particular level of some other environmental variable.

**toxicosis:** A pathological condition caused by a toxin.

**Trichoptera:** An aquatic order of insects commonly known as caddis flies.

**trigonal:** Describes mineral crystals having threefold symmetry.

**trophic position:** The position of a plant or animal in the food chain.

**turbidity:** The cloudy appearance of water caused by suspended and colloidal matter. Technically, an optical property of the water based on the amount of scattering of polarized light by suspended particles.

**U**

**ungulate:** Generally, any hoofed mammal.

**Unionidae:** The freshwater mollusks; a family of bivalve mollusks.

**V**

**valence:** The capacity of an atom or molecule to combine in specific proportions with other atoms or molecules.

**vector:** An organism, often an insect or rodent, that carries disease.

**visceral:** Of or having to do with the abdominal organs.

**volatile:** Readily vaporizable at a relatively low temperature.

**volatilization:** The transformation of a substance into a volatile form.

**wet weight:** Weight determined through techniques that preserve and measure all the moisture in the original sample.

**ww:** Wet weight.

**Z**

**Zn:** Chemical symbol for zinc.

**zooplankton:** The portion of the plankton community that consists of tiny animals.

**Greek Letter  $\mu$** 

**$\mu\text{g}$ :** Microgram.

**$\mu\text{g/L}$ :** Micrograms per liter, essentially

equivalent to parts per billion in water.

**$\mu\text{S}$ :** Microsiemens, a measure of conductivity ( $1 \mu\text{S} = 1$  micromho). Conductivity is expressed as the inverse of electrical resistance; hence  $1 \mu\text{S}$  corresponds to 1 million ohms.

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