

WQS GLOSSARY

Absorption - The uptake of water or dissolved chemicals by a cell or an organism.

Action area- All areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action.

Acute - A stimulus severe enough to induce an effect rapidly; in aquatic toxicity tests, an effect observed in 96 hours or less typically is considered acute. When referring to aquatic toxicology or human health, an acute effect is not always measured in terms of lethality.

Acute Exposure - Usually, a single exposure or a cluster of exposures within a single 24-hour period.

Acute Toxicity - A relatively short-term lethal or other adverse effect to a test organism caused by pollutants and usually defined as occurring within 4 days for fish and large invertebrates, and shorter times for smaller organisms.

Adsorption - The process by which chemicals are held on the surface of a mineral or soil particle.

Alkalinity - The property of water that resists or buffers against changes in pH upon addition of acid or base.

"Allowable Frequency" - The period of time EPA assumes that it will take ecosystems to recover after they have been subjected to chemical stressors. The Agency has selected 3 years as its allowable frequency of exceedances.

Ambient - Environmental or surrounding conditions.

Ambient Concentration - The concentration or quantity of chemicals that can be expected to occur in the aquatic environment in water, sediment, or food.

Antagonistic Effects - When two chemicals interfere with the actions of each other.

Anthropogenic - Human-induced.

Antidegradation Implementation - Existing, approved antidegradation statements consistent with 40 CFR 13 1.12 may be retained, but procedures for implementation must be established through the State water quality management (WQM) process. These

procedures will enable the State to determine on a case-by-case basis whether, and to what extent, water quality may be lowered.

Antidegradation Policy - 40 CFR 131.6 requires each State to include an antidegradation policy consistent with 40 CFR 131.12 when submitting water quality standards to EPA. These policies are designed to protect water quality and provide a method of assessing activities that may impact the integrity of the waterbody.

Applicant - An abbreviated term including all permit or license applicants. Any person, who requires formal approval or authorization from a Federal agency as a prerequisite to conducting the action.

Aquaculture - The cultivation of the natural produce of water such as fish and shellfish, as covered in section 318 of the CWA.

Aquatic Communities - A biological association consisting of all interacting populations of aquatic species inhabiting a given area or region.

Aquatic Life Criteria - Constituent concentrations, levels, or narrative statements representing a quality of water that is protective of aquatic life.

Aquifer - Any geological formation containing water, especially one that supplies water for wells, springs, etc.

Arbitrator - EPA employees, employees from other Federal Agencies, or other qualified individuals agreed upon by all parties and who will know the requirements of the water quality standards program, will have a basic understanding of the political and economic interests of Tribes, and will be expected to fulfill their duties fairly and impartially.

Artificially Created Waters - Manmade waters including irrigation ditches, canals, and created wetlands. The need to develop water quality standards for artificially created waters is determined by EPA and the State on a case-by-case basis.

Assessment Endpoint - An explicit expression, operationally defined, of the actual environmental value to be protected. The assessment endpoint consists of an **entity**, such as trout population or benthic invertebrate community, and an **attribute** of that entity, such as abundance or diversity, that one desires to protect.

ASTM Standards - Standard procedures for conducting laboratory testing as defined by the American Society of Testing and Materials (ASTM).

Averaging Periods - The period of time over which the ambient concentration is averaged for comparison with criteria concentrations.

Background Conditions - The biological, chemical, and physical conditions of a waterbody, upstream from the point or nonpoint source discharge under consideration.

BAF - Bioaccumulation Factor.

BCP - Bioconcentration Factor.

Benthic - The organisms living on sea or lake bottoms.

Best Management Practices (BMP) - An engineered structure or management activity, or combination of these, which eliminates or reduces an adverse environmental effect of a pollutant.

Bioaccumulation - The process of a chemical accumulating in a biological food chain by being passed from one organism to another as the contaminated organism is preyed upon by another organism.

Bioaccumulation Factor (BAF) - The ratio of the concentration of a chemical in the tissues of an aquatic organism to its concentration in the water. Considered where the organism and the food chain are exposed.

Bioassay - A toxicity test using selected organisms to determine the acute or chronic effects of a chemical pollutant or whole effluent.

Bioavailability - A measure of the physiochemical access that a toxicant has to the biological processes of an organism. The less the bioavailability of a toxicant, the less its toxic effect on an organism.

Biochemical Oxygen Demand (BOD) - An empirical test in which standardized laboratory procedures measure the oxygen required for the biochemical degradation of organic material and the oxygen used to oxidize inorganic materials, such as sulfides and ferrous iron.

Bioconcentration - A process by which there is a net accumulation of a chemical directly from water into aquatic organisms resulting from simultaneous uptake and elimination.

Bioconcentration Factor (BCF) - The ratio of a substance's concentration in tissues versus its concentration in water, in situations where the food chain is not exposed or contaminated.

Bioconcentration Studies - Studies involving the continuous exposure of aquatic organisms to sublethal concentrations of a toxicant.

Biocriteria - *see* Biological Criteria.

Biogeographic Zone - An area classified by its distribution of animal and plant life.

Biological assessment - In relation to the Endangered Species Act, information prepared by or under the direction of the Federal agency concerning listed and proposed species and designated and proposed critical habitat that may be present in the action area and the evaluation of potential effects of the action on such species and habitat.

Biological Criteria (or biocriteria) - Narrative expressions or numerical values that describe the biological integrity of aquatic communities inhabiting waters of a given designated aquatic life use. As such, biological criteria serve as an index of aquatic community health. Refined aquatic life use classifications based on biological measures can function as narrative biological criteria.

Biological Evaluation/Assessment - Involves conducting a biological inventory to determine the biological health of the waterbody and a biological potential analysis to evaluate what communities could potentially exist in a particular waterbody if pollution were abated or if the physical habitat were modified.

Biological Integrity - The condition of the aquatic community inhabiting unimpaired waterbodies of a specified habitat as measured by community structure and function.

Biological opinion - In relation to the Endangered Species Act, the document that states the Service's opinion as to whether or not the Federal action is likely to jeopardize the continued existence of the threatened or endangered species or result in the destruction or adverse modification of critical habitat.

Biological Standard - A legally established State rule consisting of a designated biological use (goal) and biological criteria.

Biological Survey - Biosurvey; consists of collecting, processing, and analyzing representative portions of a resident aquatic community to determine the community structure and function.

Biomass - The total weight of all living organisms or of a designated group of organisms in a given area.

Biota - The animal and plant life of a particular region or area.

BMP - Best Management Practices.

BOD - Biochemical Oxygen Demand.

Carcinogen - A chemical which has measured cancer causing effects to exposed animal or human populations.

Carcinogenic Potency Slope Factor (q_1^*) - This is an indication of a chemical's human cancer causing potential derived using animal studies or epidemiological data from human exposure. It is based on extrapolating high-dose levels over short periods of time to low dose levels and a lifetime exposure period through use of a linearized multi-stage model.

Carcinogenicity - The ability of a toxicant to cause cancer. There are many different types of cancer and many different ways in which a toxicant can trigger cancerous processes. Any chemical that significantly increases the risk of any type of cancer is classified as a carcinogen.

Cash flow - A measure of the dollars an entity has available to it in a given year, treating depreciation as cash.

CCC - Criterion Continuous Concentration.

Certification by the State Attorney General - A signed letter by the State Attorney General that stipulates that water quality standards were adopted pursuant to State law and are enforceable under State law.

Chemical Evaluation - Chemical characteristics of a waterbody are examined to determine why a designated use is not being met and to determine the potential for a particular species to survive in the waterbody if the concentration of certain chemicals were modified.

Chronic - A stimulus that lingers or continues for a relatively long period of time, often one-tenth of the lifespan or more. Chronic should be considered a relative term dependent on the life span of an organism. The measurement of a chronic effect can be reduced growth, reduced reproduction, etc., in addition to lethality.

Chronic Exposure - Exposure that occurs over a long period of time, often the entire life span of the organism.

Chronic Toxicity - A fairly long-term adverse effect to an organism (when compared with the life span of the organism) caused by or related to appetite changes, growth, metabolism, reproduction, a pollutant, genetic mutation, etc.

Clean Water Act (CWA) - The Federal Pollution Control Act (Public Law 92-500), as amended (33 U.S.C. 1251 et seq.)

CMC - Criterion Maximum Concentration.

Community - An assemblage of organisms that are associated in a common environment and interact with each other.

Compliance Schedule - A negotiated agreement between individuals from a pollutant source and a government agency that specifies dates and procedures by which a source will reduce emissions and, thereby, comply with a regulation.

Concentration-Response Relationship - The relationship between the aqueous concentration of a chemical and the degree of adverse effects that occur in aquatic organisms.

Conference - In relation to the Endangered Species Act, a process which involves informal discussions between a Federal agency and the Service under section 7(a)(4) of the Endangered Species Act regarding the impact of an action on proposed species or proposed critical habitat and recommendations to minimize or avoid the adverse effects.

Conservation - The use of all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to the Endangered Species Act are no longer necessary. Such methods and procedures include, but are not limited to, all activities associated with scientific resources management such as research, census, law enforcement, habitat acquisition and maintenance, propagation, live trapping, and transplantation, and, in the extraordinary case where population pressures within a given ecosystem cannot be otherwise relieved, may include regulated taking.

Conservation recommendations - Suggestions of the Service regarding discretionary measures to minimize or avoid adverse effects of a proposed action on listed species or critical habitat or regarding the development of information. Recommendations that explain the Service's role in assisting agencies to meet their section 7(a)(1) responsibilities. They are nonbinding suggestions and the Federal agency may elect to implement them in its proposed action.

Conventional Criteria - Criteria for constituents of wastewater that include, but are not limited to, pollutants classified as biological oxygen demand, suspended solids, oil and grease, fecal coliform, and pH.

Criteria - Elements of State water quality standards, expressed as constituent concentrations, levels, or narrative statements, representing a quality of water that supports a particular use. When criteria are met, water quality should protect the designated use.

Criterion Continuous Concentration (CCC) - The EPA national water quality criteria recommendation for the highest instream concentration of a toxicant or an effluent to which organisms can be exposed indefinitely without causing unacceptable effect.

Criterion Maximum Concentration (CMC) - The EPA national water quality criteria recommendation for the highest instream concentration of a toxicant or an effluent to which all organisms can be exposed for a brief period of time without causing an adverse acute effect.

Critical Endpoint - The adverse effect selected for study in the dose-response assessment.

Critical habitat - The (I) specific areas within the geographical area occupied by the species, at the time it is listed in accordance with the provisions of section 4 of the Endangered Species Act, on which are found those physical or biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protection; and (ii) specific areas outside the geographical area occupied by the species at the time it is listed in accordance with the provisions of section 4 of the Endangered Species Act, upon a determination by the Secretary that such species are essential for the conservation of the species.

Cumulative effects - In relation to the Endangered Species Act, those effects future State or private activities, not involving Federal activities, which are reasonably certain to occur within the action area of a Federal action subject to consultation. Those effects on the species caused by other projects and activities unrelated to the action under consultation that the Service will consider in formulating its biological opinion on the subject action.

Current Uses - Uses supported at the present time.

CWA - Clean Water Act.

Delayed Toxicity - Refers to effects of a chemical that appear only after a lag time of several days, weeks, months, or even years.

Designated non-Federal representative - In relation to the Endangered Species Act, a person designated by the Federal agency as its representative to conduct informal consultation and/or to prepare any biological assessment.

Designated Uses - Those uses specified by States in their water quality standards for each waterbody or segment, whether or not they are being attained. Uses can include coldwater fisheries, public water supply, agriculture, etc.

Destruction or Adverse Modification - In relation to the Endangered Species Act, a direct or indirect alteration that appreciably diminishes the value of critical habitat for both the survival and recovery of a listed species. Such alterations include, but are not limited to alterations adversely modifying any of those physical or biological features that were the basis for determining the habitat to be critical.

Developmental Toxicity - Adverse effects on a growing organism.

Director - The Assistant Administrator for Fisheries for the National Oceanic and Atmospheric Administration, or his authorized representative; or the Fish and Wildlife Service regional director, or his authorized representative, for the region where the action would be carried out.

Dispute Resolution Mechanism - An EPA mechanism established for resolving unreasonable consequences that arise as a result of differing water quality standards that may be set by States and Indian Tribes located on common bodies of water. Used when one or more parties to a dispute refuses to participate in either the mediation or arbitration dispute resolution process. The Regional Administrator may appoint a single official or panel to review available information pertaining to the dispute and issue a written recommendation for resolving the dispute.

Dissolved Oxygen (DO) - The amount of oxygen dissolved in water. Generally, proportionately higher amounts of oxygen can be dissolved in colder waters than in warmer waters.

Dissolved Solids - Materials such as inorganic salts, small amounts of organic matter, and dissolved material, generally associated with freshwater systems.

Distribution - The process of carrying a chemical by blood to organs and tissues throughout the body.

Diversity - The number and relative abundance of biological taxa in a specified location.

Diurnal - Daily.

DO - Dissolved Oxygen.

Dose-Response Assessment - The process used to determine the relationship between the extent of exposure to a chemical and the likelihood of the associated effect.

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

Downgrading - A term often used to refer to the removal of a use.

Dredging - Removal of mud from the bottom of waterbodies using a scooping or suction machine or other device. This disturbs the ecosystem and causes silting that can kill

aquatic life. Dredging of contaminated muds can expose aquatic life to heavy metals and other toxics. Dredging activities may be subject to regulation under section 404 of the Clean Water Act.

Early consultation - A process requested by a Federal agency on behalf of a prospective applicant under section 7(a)(3) of the Endangered Species Act.

EC₅₀ - The concentration of a chemical estimated to produce a specific effect (e.g., behavioral or physiological) in 50% of a population of test species after a specified length of exposure.

Ecological Effects Characterization: Determination of the adverse effect of a chemical, physical, or biological stressor on individuals, populations, or communities in an ecosystem.

Ecological Risk Assessment - An assessment of the likelihood that adverse ecological effects might occur or are occurring as a result of exposure to one or more stressors.

Ecological Toxicity - Adverse effects of a toxicant on a natural ecosystem; including habitat loss and wildlife impairments.

Ecologically Significant Waters - Important, unique, or ecologically sensitive waters, for example, coral reefs, hot springs, or wetlands.

Ecoregion - A relatively homogeneous area defined by similarity of climate, land form, soil, potential natural vegetation, hydrology, or other ecologically relevant variables. Regions of ecological similarity help define the potential for designated use classifications of specific waterbodies.

Ecosystem - An ecological unit consisting of both the biotic communities and the nonliving (abiotic) environment, which interact.

ED₁₀ - The dose of a chemical that produces a defined effect in 10% of the test animals exposed to that dose (Effective Dose).

EED - Estimated Exposure Dose.

Effects of the action - In relation to the Endangered Species Act, the direct and indirect effects of an action on an endangered or threatened species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action, which will be added to the environmental baseline. The environmental baseline includes the past and present impacts of all Federal, state, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of state or private actions which are contemporaneous with the consultation in process. Indirect effects are those that are caused by the proposed action and are later in time, but still are reasonably certain to occur. Interrelated actions are those that are part of a larger

action and depend on the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration.

Effluent - A substance that flows out; the treated or untreated liquids that flow out of a water treatment plant, a sewer, or an industrial outfall.

Effluent Limitation Guidelines - The degree of pollutant reduction that is attainable through the application of various levels of technology. A maximum allowable rate of discharge, concentration, or amount of a pollutant that may be released from a point source into a body of water.

Egestion - Removal of chemicals from the body that have passed through the gastrointestinal tract without being absorbed into the bloodstream.

Elimination - The process of removing chemicals from the body.

Endangered species - Any species which is in danger of extinction throughout all or a significant portion of its range other than a species of the Class Insect as determined by the Secretary to constitute a pest whose protection under the provisions of the Endangered Species Act would present an overwhelming and overriding risk to man.

Endpoint - A biological effect used as an index of the effect of a chemical on an organism.

Environmental Toxicology - The branch of toxicology that studies the effects of the exposure of humans and other living organisms to chemicals in the environment.

Ephemeral Stream - A watercourse that flows briefly only in direct response to precipitation in the immediate locality, and whose channel is at all times above the water table.

Epidemiology - The study of disease and factors that contribute to disease in humans.

Equilibrium Partitioning - A method for generating sediment criteria that focuses on the chemical interaction between sediments and contaminants. Involves the balancing of a pollutant concentration between the sediment and the water column until a steady state, or equilibrium, is reached.

Estimated Exposure Dose (EED) - The total dose of a chemical that an individual is likely to receive under defined conditions of exposure.

Estuary - Regions of interaction between rivers and nearshore 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. These brackish water ecosystems shelter and feed marine life, birds, and wildlife.

Excretion - Removal of a chemical from the body after it has been absorbed into the blood.

Existing Uses - Those uses actually attained in the waterbody on or after November 28, 1975, whether or not they are being included in the water quality standards. EPA promulgated its original water quality standards regulation on November 28, 1975, which is the reason for this index date.

Exposure Assessment - The process used to determine the extent of human exposure to a chemical before or after regulatory control.

Extrapolation - The process of using assumptions to form conclusions that extend beyond the realm of experimental data.

FAE - Final Acute Equation.

FAV - Final Acute Value.

Family - The grouping located below Order and above Genus in the taxonomic hierarchy.

FCV - Final Chronic Value.

FDA Action Level - A level specifying the point that the Food and Drug Administration can implement enforcement action involving food or feed containing levels of pesticides or other toxics.

Federal action - All activities or programs of any kind authorized, funded, or carried out, in whole or in part, by Federal agencies in the United States or upon the high seas. Examples include, but are not limited to: (a) actions intended to conserve listed species or their habitat; (b) the promulgation of regulations; (c) the granting of licenses, contracts, leases, easements, rights of way, permits, or grants-in-aid; or (d) actions directly or indirectly causing modifications to the land, water, or air.

Federal agency - Any department, agency, or instrumentality of the United States.

Fertilizer - Any substance used to make soil or water more productive. Fertilizers may be commercially produced, or they may be the result of animal or plant activities.

Final Acute Equation (FAE) - Forms the basis for acute criteria values when the acute toxicity of the material is shown to be related to a chemical characteristic of the water such as pH or hardness.

Final Acute Value (FAV) - The acute term used in aquatic life criteria calculations. It is calculated from acute toxicity data. This value forms the basis of the Criterion Maximum Concentration (CMC).

Final Chronic Value (FCV) - The chronic term used in aquatic life criteria calculations. It is calculated from chronic toxicity test data or from a combination of acute and chronic toxicity test data. It is based on the results of appropriate flow-through chronic tests.

Final Plant Value (FPV) - The term used in aquatic life criteria calculations to factor in potential adverse affects to plant life, (e.g., for herbicide criteria).

Final Residue Value (FRV) - The term used in aquatic life criteria calculations to account for adverse effects from bioconcentration and bioaccumulation. It is the lowest of the residue values that is obtained by dividing maximum permissible tissue concentrations for an organism by appropriate bioconcentration or bioaccumulation factors.

Fishable/Swimmable - A shorthand phrase reflecting the broad use categories of protection and propagation of fish, shellfish, and wildlife, and primary contact recreation, which form the interim goals of the Clean Water Act.

Fish or wildlife - Any member of the animal kingdom, including without limitation any mammal, fish, bird (including any migratory, nonmigratory, or endangered bird for which protection is also afforded by treaty or other international agreement), amphibian, reptile, mollusk, crustacean, arthropod or other invertebrate, and includes any part, product, egg, or offspring thereof, or the dead body or parts thereof.

Flow-Through Test - A test system in which the test material solutions and control water flow into and out of test chambers on a once-through basis, either intermittently or continuously.

Food Chain Multiplier - A recommended numerical multiplier derived by using the Log P of a specific chemical and relating this to the trophic level an exposed organism occupies in the food chain. This multiplier is intended for use in calculating human health criteria.

Formal consultation - In relation to the Endangered Species Act, a process between the Service and the Federal agency that commences with the Federal agency's written request for consultation under section 7(a)(2) of the Endangered Species Act and concludes with the Service's issuance of the biological opinion under section 7(b)(3) of the Act.

FPV - Final Plant Value.

"Free from" - A term adapted by EPA to express qualitative criteria. For example, "free from toxic pollutant in toxic amounts."

Frequency - How often criteria can be exceeded without unacceptably affecting the community.

FRV - Final Residue Value.

Functional Metrics - Describes the ecological processes of the community.

Genotoxic - The ability of a substance to damage an organism's genetic material (DNA).

Genus - The grouping above Species and below Family in the taxonomic hierarchy.

Geochemical - Principles of physical chemistry and geology affecting minerals and rocks.

Geometric Mean -The n th root of the product of n numbers.

Ground Water - The supply of fresh water found beneath the Earth's surface (usually in aquifers) which is often used for supplying wells and springs. Because ground water is a major source of drinking water, there is growing concern over areas where leaching agricultural or industrial pollutants or substances from leaking underground storage tanks are contaminating ground water.

Half-Life - The length of time required for the concentration of a chemical to be reduced by one-half.

Hardness - The concentration of calcium and magnesium ions in water; frequently expressed as mg/L (milligrams per liter) calcium carbonate equivalent.

Hazard - Refers to the scientific component of risk perception.

Hazard Identification - The process used to determine whether a particular chemical is causally linked to particular health effects.

Hepatic Toxicity - Adverse effects of a toxicant on the liver.

Human Health Criteria - Criteria guidance published under section 304(a) of the CWA based on the latest scientific information on the relationship that the effect of a constituent concentration has on particular aquatic species and/or human health. This information is issued periodically to the States as guidance for use in developing criteria.

Hydrophilic - Chemicals that dissolve better in water than in fatty substances.

IBI - Index of Biotic Integrity.

Immediate Toxicity - Refers to adverse effects that occur right away, usually within minutes, hours, or a few days of exposure to a chemical.

Immunotoxicity - Refers to adverse effects of a toxicant on the function of the immune system. Immunotoxic substances may decrease the ability to combat infection by bacteria, viruses, or other microorganisms; they may cause exaggerated allergic reactions; or they may cause the cells of the immune system to attack the tissues of the body as if they were foreign substances.

Import - To land on, bring into, or introduce into, or attempt to land on, bring into, or introduce into, any place subject the jurisdiction of the United states, whether or not such landing, bringing, or introduction constitutes an importation within the meaning of the customs laws of the United States.

Incidental take - Taking a listed species that results from but is not the purpose of carrying out a lawful activity conducted by the Federal agency.

Incidental take statement - This statement operates to exempt the Federal agency and any permit or license applicant involved from the section 9 “taking” prohibitions under the Endangered Species Act if the subsequent implementation of the action is consistent with the terms and conditions of the incidental take statement.

Index of Biotic Integrity (IBI) - One of the most common biological indices used as a measure of the structure and function of fish communities in freshwater streams.

Indirect effects - Effects caused by the action and that occur later in time, but are still reasonably certain to occur.

Indian Reservation - All land within the limits of any Indian reservation under the jurisdiction of the United States Government, notwithstanding the issuance of any patent, and including rights-of-ways running through the reservation.

Indian Tribe - Any Indian tribe, band, group, or community recognized by the Secretary of the Interior and exercising governmental authority over a Federal Indian Reservation.

Informal consultation - In relation to the Endangered Species Act, an optional process that includes all discussions, correspondence, etc., between the Service, Federal agency, or the designated non-Federal representative prior to formal consultation. Through informal consultation, a Federal agency may determine that formal consultation is not required.

Ingestion Exposure - Exposure through the mouth.

Inhalation Exposure - Exposure through the lungs.

Integrated Risk Information System (IRIS) - An electronic data base containing health risk and EPA regulatory information on specific chemicals. IRIS is accessible to State and local environmental agencies.

Intermittent Stream - A watercourse that flows only at certain times of the year, receiving water from springs or surface sources; also, a watercourse that does not flow continuously, when water losses from evaporation or seepage exceed available stream flow.

Interspecies Extrapolation - Use of animal data to predict what effects a chemical will have in humans.

Interstitial Water - The subsurface water contained in pore spaces between the grains of rock and sediment.

Intraspecies - Within a single species.

Invertebrate - An organism without a backbone.

In Vitro Studies - Studies of chemical effects not conducted in living organisms; instead, tests usually involve observing a chemical's effects in a cell culture or other tissue preparation.

Ionization - The process of a chemical breaking up into ions, or charged particles, e.g., the compound NaCl (sodium chloride, or table salt) ionizes in water into two particles: Na⁺ and Cl⁻.

IRIS - Integrated Risk Information System.

Irreversible Effects - Adverse effects that persist or intensify even after exposure to the chemical has ended.

Jeopardy - In relation to the Endangered Species Act, a set standard requiring detrimental impacts to the continued existence of a species under a joint survival and recovery concept. To "jeopardize the continued existence of" means to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species. The "continued existence" of the species is the key to the jeopardy standard, placing an emphasis on injury to a species "survival". However, significant impairment of recovery efforts or other adverse effects which rise to the level of "jeopardizing" the "continued existence" of a listed species can also be the basis for issuing a "jeopardy" opinion. The very concept of "jeopardy" is that a Federal agency should not authorize, fund, or carry out an action that would injure a listed species' chances for survival to the point that recovery is not attainable.

LC₅₀ (Median Lethal Concentration) - A standard measure of toxicity identifying the concentration of material that is lethal to 50% of test organisms over a specific time of observation.

LD₅₀ (Median Lethal Dose) - The dose of a toxicant that will kill 50 percent of the test organisms within a designated period of time; the lower the LD₅₀, the more toxic the compound.

Lethality - The ability of a toxicant to cause the death of exposed individuals or populations.

Lipid Solubility - The maximum concentration of a chemical that will dissolve in fatty substances; lipid-soluble substances are insoluble in water. If a substance is lipid-soluble, it will selectively disperse through the environment via living tissue.

Lipophilic - Chemicals that dissolve better in fatty substances than in water.

Liquidity - Measured by the Current Ratio, which compares current assets - assets that could be converted to cash during the current year - with current liabilities, items that must be paid within the current year.

Listed species - Any species of fish, wildlife, or plant which has been determined to be endangered or threatened under section 4 of the Endangered Species Act. Listed species are found in 50 CFR 17.11-17.12.

Load Allocation - The portion of a receiving water's loading capacity that is attributed either to one of its existing or future nonpoint sources of pollution or to natural background sources. Load allocations are the best estimates of the loading, which may range from reasonable accurate estimates to gross allotments. This will depend on the availability of data and appropriate techniques for predicting the loading. Wherever possible, natural and nonpoint source loads should be distinguished.

LOAEL (Lowest-observed-adverse-effect level) - The lowest concentration of an effluent or toxicant that results in statistically significant adverse health effects, as observed in chronic or subchronic human epidemiology studies or animal exposure.

Log P - The ratio, in a two-phase system of n-octanol and water at equilibrium, of the concentration of a chemical in the n-octanol phase to that in the water phase.

Low Flow - Water quality standards should protect water quality for designated uses in critical low-flow situations. In establishing water quality standards, States may designate a critical low stream flow below which numerical water quality criteria do not apply.

Magnitude - The amount of a pollutant (or pollutant parameter such as toxicity), expressed as a concentration or toxic unit, that is allowable.

Major construction activity - A construction project (or other undertaking having similar physical impacts) which is a major Federal action significantly affecting the quality of the human environment for purposes of the National Environmental Policy Act [NEPA, 42 U.S.C. 4332(2)(C)]. The term encompasses dams, buildings, pipelines, roads, water resource developments, channel improvements, and other such undertakings which significantly modify the physical environment.

Maximum Contaminant Level (MCL) - The maximum permissible level of a contaminant in water delivered to any user of a public water system. MCLs are enforceable standards.

"May affect" - In relation to the Endangered Species Act, a term used when a proposed action by a Federal agency could have an impact (either positive or negative) on a listed species or its critical habitat.

MCL - Maximum contaminant Level.

Measure of Effect - A measurable environmental characteristic related to the assessment endpoint. A measurement endpoint can be the same as the assessment endpoint, such as the abundance of trout, or another measurable population response such as number of fry produced each season.

Mediator - Neutral facilitator whose function is to encourage communication and negotiation between all parties to the dispute.

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.

Metrics - Numerical values that represent species composition or other quantitative community parameters.

Microcosm Study - An investigation using a miniaturized representation of an ecosystem.

Minimum Attainable Uses - Uses that can be achieved when effluent limits under section 306 of the Clean Water Act are imposed under point source dischargers and when cost-effective and reasonable best management practices are imposed on nonpoint source dischargers.

Mixing Zone - A limited area or volume of water where initial dilution of a discharge takes place and where numeric water quality criteria can be exceeded but acutely toxic conditions are prevented from occurring. A mixing zone defines the location where a discharge, which may exceed numeric limits, can mix with water of higher quality so that dilution can occur.

Modeling - An investigative technique using a mathematical or physical representation of a system or theory that accounts for all or some of its known properties. Models are often used to test the effects of changes of system components on the overall performance of the system.

Monitoring - Periodic or continuous surveillance or testing to determine the level of compliance with statutory requirements and/or pollutant levels in various media or in humans, animals, and other living things.

Mutagenicity - The ability of chemicals to cause changes in the genetic material in the nucleus of cells in ways that can be transmitted during cell division. Changes in specific genes or in the total number of chromosomes present in a cell are examples of mutagenic effects. In many cases, substances that are mutagenic are also carcinogenic.

Narrative Criteria - Criteria expressed in concise statements, generally in a "free from" format. General statements of attainable or attained conditions of ecological integrity and water quality for a given use designation.

Narrative Translator - The procedure used for translating narrative standards to numerical criteria.

National Pollutant Discharge Elimination System (NPDES) - A provision of the Clean Water Act, section 402, that prohibits discharge of pollutants from point sources 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.

Navigable Waters - The waters of the United States, including the territorial seas and interstate waters.

Neurotoxicity - Refers to adverse effects of a chemical on a structure or function of the nervous system. Any change in the ability to respond to stimuli, move about, use senses to gather information, think clearly, or behave in normal ways may be evidence of a chemical's adverse effects on the nervous system.

NOAEL (No-observed-adverse-effect level) - A tested dose of an effluent or a toxicant below which no adverse biological effects are observed, as identified from chronic or subchronic human epidemiology studies or animal exposure studies.

Nonconventional Pollutants - Nonconventional pollutants are substances not included in the groupings "conventional" or "toxic" that may require regulation. These include "whole effluent toxicity" and nutrients such as nitrogen and phosphorus.

Nonpoint Source - Pollution sources that are diffuse and do not have a single point of origin or are not introduced into a receiving water from a specific outlet. The pollutants are generally carried off the land by stormwater runoff. The commonly used categories for nonpoint sources are agriculture, forestry, urban, mining, construction, dams and channels, land disposal, and saltwater intrusion.

Nonpolar Organic Contaminants - Carbon-based compounds that have identical centers for both positive and negative charges, including symmetrical molecules of combined polar molecules. Examples include benzo(a)pyrene, DDT, chlordane, and PAHs.

Nonthreshold Effects - Associated with exposure to chemicals that have no safe exposure levels (i.e., cancer).

NPDES - National Pollutant Discharge Elimination System.

Numeric Criteria - Criteria expressed as a concentration of chemicals in or properties of water that should protect a designated use.

Nutrient - Any substance, such as fertilizer phosphorus and nitrogen compounds, that enhances the growth of plants and animals.

Organoleptic - Having to do with taste and smell. As used in criteria development, it refers to the tendency of a chemical to affect the taste and smell of water or fish and shellfish.

ONRW - Outstanding National Resource Water.

Outfall - The site of initial discharge.

Outrage - Refers to the emotional component of risk perception.

Outstanding National Resource Water (ONRW) - High-quality or ecologically unique waters, such as those within the jurisdiction of National and State parks and wildlife refuges including swamps or hot springs. The primary intent of establishing ONRWs is to protect waters having special environmental and recreational attributes.

Partitioning - Part of the contaminant will adsorb onto the sediment; another part will dissolve into the pore waters; while yet another part will volatilize out completely.

Pathogenic Organism - An organism that produces disease.

Pathways - Sites of exposure.

Permit - A legally binding document issued by a State or Federal permits agency to the owner or manager of a point source discharge. The permit document contains a schedule of compliance requiring the permit holder to achieve a specified standard or limitation (by constructing treatment facilities or modifying plant processes) by a specified date, which is usually the date that the permit becomes effective. Permit documents also specify monitoring and reporting requirements to be conducted by the applicant. All permits issued are valid for a maximum of 5 years.

Permit or license applicant - (When used with respect to an action of a Federal agency for which exemption is sought under section 7) Any person whose application to such agency for a permit or license has been denied primarily because of the application of section 7(a) to such agency action.

Pesticide - Any chemical or biological agent that kills plants or animal pests. Herbicides, insecticides, nematocides, miticides, algicides, etc., are all pesticides.

pH - The negative logarithm of the effective hydrogen-ion concentration. Used to express acidity (values less than 7) and alkalinity (values greater than 7).

Pharmacokinetics - Quantitation of the time course of a chemical involving such aspects as absorption, distribution, biotransformation, and excretion are thought of as the kinetics of the chemical.

Physical Evaluation - In general, physical parameters, such as flow, temperature, water depth, velocity, substrate, reaeration rates, and other factors are evaluated to identify any physical limitations that may preclude the attainment of the designated use.

Plume - The visible or measurable discharge of a contaminant from a given point of origin.

Point Source - Any discernible, confined, and discrete conveyance, including any conduit pipe, ditch, channel, sewer, tunnel, vessel, or other floating craft from which pollutants are or may be discharged.

Pollutant - Waste discharged into water, including dredged soil, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, discarded equipment, and rock.

Population - A group of organisms of the same species inhabiting a specified geographic locality.

POTWs - Publicly Owned Treatment Works.

Power of Eminent Domain - The right of a government to appropriate private property for public use, usually with compensation to the owner.

Preliminary biological opinion - In relation to the Endangered Species Act, an opinion issued as a result of early consultation.

Pretreatment - Processes used to reduce, eliminate, or alter the nature of wastewater pollutants from nondomestic sources before they are discharged into publicly owned treatment works.

Primary Contact Recreation - Activities involving immersion in water, such as swimming, waterskiing, scuba diving, and surfing.

"Priority" Pollutants - Refers to section 307(a) of the CWA, a list of priority pollutants consisting of 65 compounds and families of compounds that are among the most persistent, prevalent, and toxic of chemicals known to man. These 65 compounds or families of compounds have been translated into 123 individual toxic pollutants.

Promulgation - The process of writing, receiving comments, and publishing rules that have the same effect as laws.

Proposed critical habitat - Habitat proposed in the *Federal Register* to be designated or revised as critical habitat under section 4 of the Endangered Species Act for any listed or proposed species.

Proposed species - Any species of fish, wildlife, or plant that is proposed in the *Federal Register* to be listed under section 4 of the Endangered Species Act.

Publicly Owned Treatment Works (POTWs) - Waste-treatment works owned by a State, local government, or Indian tribe, usually designed to treat domestic wastewaters.

q₁* - Carcinogenic Potency Slope Factor.

Qualitative Approach - Use designation classifications used by some States to reflect a qualitative assessment or goal for each waterbody.

Quantitative Approach - Use designation classifications used by some States to reflect basic use categories to be attained on a waterbody without specifying the relative quality.

RAC - Reference Ambient Concentration.

Reasonable and prudent alternatives - In relation to the Endangered Species Act, alternative actions identified during formal consultation that can be implemented in a manner consistent with the scope of the Federal agency's legal authority and jurisdiction, that is economically and technologically feasible, and that the Director believes would avoid the likelihood of jeopardizing the continued existence of listed species or resulting in the destruction or adverse modification of critical habitat. An alternative is considered reasonable and prudent only if it can be implemented by the Federal agency and any applicant in a manner consistent with the intended purpose of the action, and if the Director believes it would avoid the likelihood of jeopardizing the continued existence of the listed species or resulting in the destruction or adverse modification of critical habitat of such species. If there are no alternatives that meet the definition of "reasonable and prudent alternatives" the Service will issue a "jeopardy" biological opinion without alternatives.

Reasonable and prudent measures - In relation to the Endangered Species Act, those actions the Director believes necessary to appropriate to minimize the impacts (i.e., amount or extent, of incidental take).

These are provided in an incidental take statement. Reasonable and prudent measures were intended to minimize the level of incidental taking, but Congress also intended that the action go forward essentially as planned.

Receiving Waters - Waters of a water course or waterbody that receive treated or untreated wastewaters.

Recovery - Improvement in the status of listed species to the point at which listing is no longer appropriate under the criteria set out in the section 4(a)(1) of the Endangered Species Act.

Reference Ambient Concentration (RAC) - The concentration of a chemical in water that will not cause adverse impacts to human health. RAC is expressed in kits of mg/L.

Reference Conditions - The characteristics of the segments of a waterbody that are least impaired by human activities. As such, reference conditions can be used to describe

attainable biological or habitat conditions for waterbody segments with common watershed/catchment characteristics within geographical regions.

Regulations - Requirements issued by executive agencies to carry out the intent of the law and guide the activities regulated by the agency.

Renal Toxicity - Adverse effects of a toxicant on the kidneys.

Reproductive Toxicity - Adverse effects on an adult's reproductive capability.

Reversible Effects - Adverse effects that last only as long as a person is exposed to the chemical.

RfD (Reference Dose) - An estimate of the daily exposure to a human population that is likely to be without an appreciable risk of deleterious effect during a lifetime; derived from the no-observed-adverse-effect levels or lowest-observed-adverse-effect level.

Riparian Zone - An area adjacent to and along a watercourse that often is vegetated and that constitutes a buffer zone between the nearby lands and the watercourse.

Risk - The likelihood of injury, disease, or death.

Risk Assessment - The process used by EPA and individual States to assess overall risks posed by specific substances. Risk assessment quantifies the risk of injury associated with a specific activity or set of conditions.

Risk Characterization - The goal of the risk assessment process, in which the results of the preceding steps are integrated to produce as precise a description of the environmental or health risk as the available data will allow.

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

Routes of Exposure - Avenues by which a chemical comes into contact with an organism (e.g., inhalation, ingestion, transdermal).

Runoff - Water that runs off the land in sheet flow, in rivulets, or in defined watercourses.

Salinity - The degree of salt in water.

Screening Level Risk Assessment - A methodology that identifies chemicals or other stressors of potential concern to eliminate from further assessment those stressors which are considered not to pose significant risk.

Secondary Contact Recreation - Activities where a person's water contact would be limited to the extent that bacterial infections of eyes, ears, respiratory or digestive systems, or urogenital areas would normally be avoided.

Secretary - The Secretary of the Interior or the Secretary of Commerce as program responsibilities are vested pursuant to the provisions of Reorganization Plan Numbered 4 of 1970; except that with respect to the enforcement of the provisions of the Endangered Species Act and the Convention which pertain to the importation or exportation of terrestrial plant, the term also means the Secretary of Agriculture.

Section 304(a) Criteria - Developed by EPA under authority of section 304(a) of the Act. These criteria are based on the latest scientific information on the effect of constituent concentrations on particular aquatic species and/or human health. This information is issued periodically to the States as guidance for use in developing standards.

Section 319 Management Plan - Outlines State's control strategy for nonpoint sources of pollution.

Section 7 Consultation - Analyzes whether the "effects of the action" on listed species, plus any additional, cumulative effects of state and private actions which are reasonably certain to occur in the action area, are likely to jeopardize the continued existence of that species. Based on this analysis, the Federal agency determines whether it can proceed without exceeding the jeopardy standard. If the jeopardy standard is exceeded, the proposed Federal action cannot proceed without an exemption. The purpose of consultation is to identify conflicts between proposed Federal actions and the "jeopardy" standard of section 7(a)(2).

Sediment - Soil, sand, and minerals washed from land into water usually, after rain. These pile up in reservoirs, rivers, and harbors, destroying the nesting areas of fish and the holes of water animals and clouding the water so that needed sunlight might not reach aquatic plants. Careless farming, mining, and building activities will expose sediment materials, allowing them to be washed off the land after rainfalls.

Sediment Criteria - Criteria concerning the organic and inorganic material that has settled at the bottom of a waterbody. Contaminated sediments can pose serious threats to human health and the environment by serving as a persistent source of toxic chemicals.

Segment - A portion of a river basin, the surface waters of which have common hydrological characteristics (or flow regulation pollutants); common natural, physical, chemical, and biological processes; and common reactions to external stresses, such as disbaring of pollutants. Waterbodies may be segmented such that different water quality standards may apply to different segments of the same waterbody.

Service - The U.S. Fish and Wildlife Service or the National Marine Fisheries Service, as appropriate.

Site-Specific Criteria - Criteria relevant to a given localized site and which reflect local environmental conditions.

SMAV - Species Mean Acute Value.

Solvency - A measure of how easily an entity can pay bills and debts that are owed on a regular basis for periods longer than one year.

Spatial Scales - The wide variety of subhabitats that exist within any surface water habitat.

Species - Any subspecies of fish or wildlife or plants, and any distinct population segment of any species or vertebrate fish or wildlife which interbreeds when mature.

Species Mean Acute Value (SMAV) - The geometric mean of appropriate LC₅₀ toxicity tests for a given species. Used as the basis for calculating the Genus Mean Acute Value (GMAV).

State - The 50 States, the District of Columbia, United States territories, and authorized Indian Tribes. U.S. territories include the Commonwealth of Puerto Rico, American Samoa, the Virgin Islands, the Commonwealth of the Northern Mariana Islands, Guam, and the Trust Territory of the Pacific Islands.

State agency - Any state agency, department, board, commission, or other governmental entity which is responsible for the management and conservation of fish, plant, or wildlife resources within a state.

Stressor- Any physical, chemical, or biological entity that can induce an adverse response.

Stressor-Response Assessment - Characterizing the relationship between the magnitude of a stressor and the incidence of an adverse effect.

Structural Metrics - The composition of a community.

Structure-Activity Studies - Studies that attempt to identify the elements of a toxicant's chemical structure that are important to its activity.

Subchronic Toxicity Studies - Studies that involve daily administration of low to moderate doses of the toxicant for an extended period of time.

Suspended Solids - A description of the organic and inorganic particulate matter in water.

Synergism - The characteristic property of a mixture of toxicants that exhibits a greater-than-additive total toxic effect.

Take - To harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.

Target Organ Toxicity - Adverse effects of a toxicant on a particular organ or tissue.

Taxonomic Category - One of a hierarchy of levels in the biological classification of organisms; the seven major categories include: Kingdom, Phylum, Class, Order, Family, Genus, and Species.

Technology-based Effluent Limitations - Effluent limitations that reflect the best technology economically achievable for industrial discharges to surface waters. These limits are applicable to direct and indirect sources that are developed on a category-by-category basis using statutory factors, not including water quality effects.

Temporal Scales - Refer to aquatic community changes that occur over time because of diurnal and lifecycle changes in organism behavior or development and seasonal or annual changes in the environment.

Teratogenicity - Defects induced during development between conception and birth.

Threatened species - Any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

Threshold Effects - Result from chemicals that have a safe level (i.e., acute, subacute, or chronic human health effects); the point at which an action or effect is produced.

TMDL - Total Maximum Daily Load.

Total Debt - Equal to the debt for the current year plus the long-term debt.

Total Maximum Daily Load (TMDL) - A numerical quantification of the pollutant loading that can be received by a waterbody from all sources without exceeding State water quality standards. The TMDL consists of wasteload allocations for point sources (e.g., industrial and municipal discharges), load allocations for nonpoint sources (e.g., agriculture, construction, silviculture), and a margin of safety so that any additional loading, regardless of source, would not produce a violation of water quality standards.

Toxic Pollutants - Materials contaminating the environment that cause death, disease, and/or birth defects in organisms that ingest or absorb them. The quantities and length of exposure necessary to cause these effects can vary widely. Pollutants listed by the EPA Administrator under section 307(a) of the Clean Water Act are a subset of this group of materials.

Toxicants - Pollutants harmful to living organisms.

Toxicology - The study of poisons, or toxicants, and their effects on living biological systems.

Transdermal Exposure - Exposure through the skin.

Translator - A procedure that can be adopted by States to translate narrative standards into numerical criteria.

Trophic Level - This refers to the arrangement of consumer organisms into different feeding levels (i.e., the position of an organism in the food chain). Each level is referred to as trophic level.

Turbidity - The presence of sediment in water, making it unclear, murky, or opaque.

Uncertainty Factors - A number (equal to or greater than one and usually a multiple of 10) that represents a specific level of uncertainty inherent in available data; for example, a factor of 10 may be used to account for the possible differences in responsiveness between humans and animals in prolonged exposure studies.

UAA - Use Attainability Analysis.

Use Attainability Analysis (UAA) - A multifaceted assessment of the environmental and economic factors affecting the attainment of a use for a specific waterbody.

Variance - A temporary exemption from water quality standards granted to an individual discharger.

Waste Load Allocation - The maximum load of pollutants each discharger of waste is allowed to release into a particular waterway. Discharge limits are usually required for each specific water quality criterion this is being violated or is expected to be violated.

Waterbody - An enlargement of a watercourse or a geological basin filled with water, such as a lake or a pond.

Water Column - The depth of water in any waterbody measured from the surface to the bottom sediments.

Water Effects Ratios (WERS) - Quantifiable difference in a material's toxicity in site and laboratory water.

Water Quality - The chemical, biological, and physical integrity of a body of water.

Water Quality Assessment - An evaluation of the condition of a waterbody using biological surveys, chemical-specific analyses of pollutants in waterbodies, and toxicity tests.

Water Quality-based Effluent Limitations - Effluent limitations that refer to specific levels of water quality that are expected to render a body of water suitable for its designated use.

Water Quality Management Plan - Identifies the overall mechanism by which a State integrates the various CWA control requirements into a coherent framework.

Water Quality Standard - The water quality goals of a waterbody (or a portion of the waterbody) designating the use or uses to be made of the water and establishing criteria necessary to protect those uses. Standards can be either State regulations or laws, or Federal regulations applied to a specific State.

Waters of Ecological Significance - Waters that are important, unique, or ecologically sensitive, such as wetlands, coral reefs, and hot springs.

Waters of the United States - All interstate waters and all waters that could affect interstate or foreign commerce.

Watershed - A watershed is a drainage area or basin in which all land and water areas drain or flow toward a central collector such as a river, stream, or lake.

WERS - Water Effects Ratios.

Wetlands - Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, estuaries, and similar areas.

Whole-Effluent Toxicity - The total toxic effect of an effluent measured directly with a toxicity test.