

# Water & Environmental Glossary

This glossary is a compilation of hydrologic and environmental terms published by the USGS and the New York State Department of Environmental Conservation.

The terms herein are not necessarily the only valid definitions for these terms.

## A

**Acid** – Has a pH of water less than 5.5; pH modifier used in the U.S. Fish and Wildlife Service wetland classification system; in common usage, acidic water has a pH less than 7.

**Acidic deposition** – The transfer of acidic or acidifying substances from the atmosphere to the surface of the Earth or to objects on its surface. Transfer can be either by wet-deposition processes (rain, snow, dew, fog, frost, hail) or by dry deposition (gases, aerosols, or fine to coarse particles).

**Acre-foot (acre-ft.)** – The volume of water needed to cover an acre of land to a depth of one foot; equivalent to 43,560 cubic feet or 325,851 gallons.

**Activated carbon** – A highly absorbent form of carbon, formed primarily from coal and lignite, that absorbs organic compounds. "Activated carbon treatment systems" are used to remove odors and toxic substances from liquid or gaseous emissions.

**Acute effects** – Health effects that have a rapid onset, a short course, and pronounced symptoms and termination. A reaction that occurs shortly after exposure to a chemical.

**Acute exposure** – A single, short contact with a chemical. It may last a few seconds or a few hours, but no longer than a day.

**Administrative order on consent** – See Consent order.

**Administrative record** – Part of a site's Record of Decision (ROD) which lists and defines documents used in the development of DEC's decision about selection of a remedial action.

**Adsorb/Adsorption** – Molecules of gas, liquid, or dissolved solids that adhere or "stick" to the surfaces they come in contact with. Some chemicals adsorb strongly to soil particles. This differs from absorb: "to take up or make part of the existing whole," like a sponge absorbs (sucks up) water.

**Aerate** – To supply air to water, soil, or other media.

**Aerobic** – Pertaining to, taking place in, or caused by the presence of oxygen.

**Air sparging** – Injecting air or oxygen into an aquifer to strip or flush volatile contaminants such as air bubbles up through the groundwater. The air is captured by a vapor extraction system. See Soil vapor extraction system.

**Air stripping** – A treatment system that removes or "strips" volatile organic compounds from contaminated groundwater or surface water by forcing an airstream through the water and causing the compounds to evaporate.

**Algae** – Chlorophyll-bearing nonvascular, primarily aquatic species that have no true roots, stems, or leaves; most algae are microscopic, but some species can be as large as vascular plants.

**Algal bloom** – The rapid proliferation of passively floating, simple plant life, such as blue-green algae, in and on a body of water.

**Alkaline** – Has a pH greater than 7; pH modifier in the U.S. Fish and Wildlife Service wetland classification system; in common usage, a pH of water greater than 7.4.

**Alluvial aquifer** – A water-bearing deposit of unconsolidated material (sand and gravel) left behind by a river or other flowing water.

**Alluvium** – General term for sediments of gravel, sand, silt, clay, or other particulate rock material deposited by flowing water, usually in the beds of rivers and streams, on a flood plain, on a delta, or at the base of a mountain.

**Alpine snow glade** – A marshy clearing between slopes above the timberline in mountains.

**Amalgamation** – The dissolving or blending of a metal (commonly gold and silver) in mercury to separate it from its parent material.

**Ambient** – The surrounding environment. Ambient usually refers to the surrounding outdoor air, water, or land.

**Ammonia** – A compound of nitrogen and hydrogen (NH<sub>3</sub>) that is a common by-product of animal waste. Ammonia readily converts to nitrate in soils and streams.

**Anadromous fish** – Migratory species that are born in freshwater, live mostly in estuaries and ocean water, and return to freshwater to spawn.

**Anaerobic** – Pertaining to, taking place in, or caused by the absence of oxygen.

**Analyte** – A chemical being tested for in a laboratory test.

**Anomalies** – As related to fish, externally visible skin or subcutaneous disorders, including deformities, eroded fins, lesions, and tumors.

**Anthropogenic** – Having to do with or caused by humans.

**Anticline** – A fold in the Earth's crust convex upward, whose core contains stratigraphically older rocks.

**Applicable or Relevant and Appropriate Requirements (ARARs)** – Any state or federal statute that pertains to protection of human life and the environment in addressing specific conditions or use of a particular cleanup technology at a Superfund site.

**Aquaculture** – The science of farming organisms that live in water, such as fish, shellfish, and algae.

**Aquatic** – Living or growing in or on water.

**Aquatic guidelines** – Specific levels of water quality which, if reached, may adversely affect aquatic life. These are nonenforceable guidelines issued by a governmental agency or other institution.

**Aquatic-life criteria** – Water-quality guidelines for protection of aquatic life. Commonly refers to criteria established by the U.S. Environmental Protection Agency. See also Water-quality guidelines, Water-quality criteria, and Freshwater chronic criteria.

**Aquifer** – A geologic formation, group of formations, or part of a formation that contains sufficient saturated permeable material to yield significant quantities of water to springs and wells.

**Aquifer recharge** – See Recharge

**Aquitard** – Geological formation that may contain groundwater but significant quantities of water will not move through it under normal conditions. May function as a confining layer.

**Arroyo** – A small, deep, flat-floored channel or gully of an ephemeral or intermittent stream, usually with nearly vertical banks cut, into unconsolidated material. A term commonly used in the arid and semiarid regions of the Southwestern United States.

**Arsenic** – An element used in wood preservatives and pesticides.

**Artificial recharge** – Augmentation of natural replenishment of ground-water storage by some method of construction, spreading of water, or by pumping water directly into an aquifer.

**Atmospheric deposition** – The transfer of substances from the air to the surface of the Earth, either in wet form (rain, fog, snow, dew, frost, hail) or in dry form (gases, aerosols, particles).

**Atmospheric pressure** – The pressure exerted by the atmosphere on any surface beneath or within it; equal to 14.7 pounds per square inch at sea level.

**Attenuation** – See Natural attenuation

**Availability session** – A scheduled gathering of program staff and members of the public in a casual setting, with or without a formal presentation or agenda but usually focusing on a specific aspect of a site's remedial process.

**Average discharge** – As used by the U.S. Geological Survey, the arithmetic average of all complete water years of record of surface water discharge whether consecutive or not. The term "average" generally is reserved for average of record and "mean" is used for averages of shorter periods, namely, daily, monthly, or annual mean discharges. See also Mean

## B

**Background, Background level** – The concentration of a substance in air, water, or soil that occurs naturally or is the result of human activities not related to a hazardous waste site; conditions in the area near, but not affected by, a hazardous waste site. "Background samples" are often taken to compare an area's natural or pre-existing conditions to conditions at a hazardous waste site.

**Backwater** – A body of water in which the flow is slowed or turned back by an obstruction such as a bridge or dam, an opposing current, or the movement of the tide.

**Bacteria** – Single-celled microscopic organisms.

**Bank** – The sloping ground that borders a stream and confines the water in the natural channel when the water level, or flow, is normal.

**Bank storage** – The change in the amount of water stored in an aquifer adjacent to a surface-water body resulting from a change in stage of the surface-water body.

**Barrier bar** – An elongated offshore ridge, submerged at least at high tide, built up by the action of waves or currents.

**Barrier beach** – A narrow, elongated sandy ridge rising slightly above the high-tide level and extending generally parallel with the mainland shore, but separated from it by a lagoon.

**Barrier protection layer** – A layer of soil covering a geomembrane designed to protect the geomembrane from wear and tear caused by the weather, animals, etc.

**Base** – Bases are chemicals that have a large concentration of hydroxyl (one hydrogen plus one oxygen atom) ions. A basic compound has a pH of more than 7 on a scale of 0 to 14. Strong bases, pH closer to 14, are corrosive. Weak bases, with pH closer to 7, are not. An acid can neutralize the effects of a base.

**Base flow** – The sustained low flow of a stream, usually ground-water inflow to the stream channel.

**Basic** – The opposite of acidic; water that has a pH of greater than 7.

**Basic Fixed Sites** – Sites on streams in NAWQA Study Units at which streamflow is measured and samples are collected for analysis of temperature, salinity, suspended sediment, major ions and metals, nutrients, and organic carbon to assess the broad-scale spatial and temporal character and transport of inorganic constituents of streamwater in relation to hydrologic conditions and environmental settings.

**Basin** – See Drainage basin.

**Basin and Range physiography** – A region characterized by a series of generally north-trending mountain ranges separated by alluvial valleys.

**Bed material** – Sediment composing the streambed.

**Bedrock** – The continuous solid rock of the continental crust. Bedrock can be found anywhere from the surface to hundreds of feet below ground. Bedrock can be solid or it can contain numerous cracks (fractures). Groundwater and chemicals can move through fractured bedrock.

**Bed sediment** – The material that temporarily is stationary in the bottom of a stream or other watercourse.

**Bed sediment and tissue studies** – Assessment of concentrations and distributions of trace elements and hydrophobic organic contaminants in streambed sediment and tissues of aquatic organisms to identify potential sources and to assess spatial distribution of those constituents.

**Bedload** – Sediment that moves on or near the streambed and is in almost continuous contact with the bed.

**Benthic invertebrates** – Insects, mollusks, crustaceans, worms, and other organisms without a backbone that live in, on, or near the bottom of lakes, streams, or oceans.

**Benthic organism** – A form of aquatic life that lives on or near the bottom of streams, lakes, or oceans.

**Bentonite** – A very fine clay, expansible when moist, commonly used to provide a tight seal around a monitoring well. Also used in slurry walls.

**Best management practice (BMP)** – An agricultural practice that has been determined to be an effective, practical means of preventing or reducing nonpoint-source pollution.

**Bind** – To exert a strong chemical attraction.

**Bioaccumulation** – The biological sequestering of a substance at a higher concentration than that at which it occurs in the surrounding environment or medium. Also, the process whereby a substance enters organisms through the gills, epithelial tissues, dietary, or other sources.

**Bioavailability** – The capacity of a chemical constituent to be taken up by living organisms either through physical contact or by ingestion.

**Biochemical** – Refers to chemical processes that occur inside or are mediated by living organisms.

**Biochemical process** – A process characterized by, produced by, or involving chemical reactions in living organisms.

**Biochemical-oxygen demand (BOD)** – The amount of oxygen, expressed in milligrams per liter, that is removed from aquatic environments by the life processes of micro-organisms.

**Biodegradation** – Transformation of a substance into new compounds through biochemical reactions or the actions of microorganisms such as bacteria.

**Biomass** – The amount of living matter, in the form of organisms, present in a particular habitat usually expressed as weight-per-unit area.

**Bioremediation** – The degradation (breakdown) or stabilization of contaminants in the environment by microorganisms. There are many remedial techniques that use microorganisms, such as bacteria, to break down contaminants. Any of these techniques may be called bioremediation.

**Biota** – All the living organisms in a given area.

**Blowout** – A small saucer- or trough-shaped hollow or depression formed by wind erosion on a preexisting dune or other sand deposit.

**Blue-baby syndrome** – A condition most common in young infants and certain elderly people that can be caused by ingestion of high amounts of nitrate, which results in the blood losing its ability to effectively carry oxygen.

**Bog** – A nutrient-poor, acidic wetland dominated by a waterlogged, spongy mat of sphagnum moss that ultimately forms a thick layer of acidic peat; generally has no inflow or outflow; fed primarily by rainwater.

**Bolson** – An extensive, flat, saucer-shaped, alluvium-floored basin or depression, almost or completely surrounded by mountains and from which drainage has no surface outlet; a term used in the desert regions of the Southwestern United States.

**Boreal** – A climatic zone having a definite winter with snow and a short summer that is generally hot and which is characterized by a large annual range of temperature.

**Borehole** – Hole made with drilling equipment.

**Boring** – See Soil boring

**Bosque** – A dense growth of trees and underbrush.

**Bottom land** – See Flood plain.

**Bottom-land forest** – Low-lying forested wetland found along streams and rivers, usually on alluvial flood plains.

**Brackish water** – Water with a salinity intermediate between seawater and freshwater (containing from 1,000 to 10,000 milligrams per liter of dissolved solids).

**Braided stream** – A stream characterized by an interlacing or tangled network of several small branching and reuniting shallow channels.

**Breakdown product** – A compound derived by chemical, biological, or physical action upon a pesticide. The breakdown is a natural process that may result in a more toxic or a less toxic compound and a more persistent or less persistent compound.

**Brine** – Water that contains more than 35,000 milligrams per liter of dissolved solids.

**Brownfield** – Abandoned, idled, or underused properties where expansion or redevelopment is complicated by real or perceived environmental contamination. Brownfield sites can pose environmental,

legal, and financial burdens on a community and its taxpayers.

## C

**Calcareous** – A rock or substance formed of calcium carbonate or magnesium carbonate by biological deposition or inorganic precipitation, or containing those minerals in sufficient quantities to effervesce when treated with cold hydrochloric acid.

**Caldera** – A large, more or less circular, basin-shaped volcanic depression whose diameter is many times greater than the volcanic vent.

**Canopy angle** – Generally, a measure of the openness of a stream to sunlight. Specifically, the angle formed by an imaginary line from the highest structure (for example, tree, shrub, or bluff) on one bank to eye level at midchannel to the highest structure on the other bank.

**Cap** – See Landfill cap/Landfill cover system

**Capillary fringe** – The zone above the water table in which water is held by surface tension. Water in the capillary fringe is under a pressure less than atmospheric.

**Carbon adsorption** – A process by which contaminants are removed from groundwater or surface water when the water is forced through tanks containing activated carbon, a material that attracts the contaminants.

**Carbonate rocks** – Rocks (such as limestone or dolostone) that are composed primarily of minerals (such as calcite and dolomite) containing the carbonate ion ( $\text{CO}_3^{2-}$ ).

**Carbon tetrachloride** – A colorless, non-flammable liquid with a characteristic odor used as a solvent and in the synthesis of fluorocarbons.

**Carcinogen** – A cancer-producing substance.

**Carcinogenic** – Capable of producing or inciting cancer.

**Catch basin or catch-basin** – **1)** A structure used to catch sediments for contaminant retention, often on a stream. **2)** A cistern or vault at the point where a pipe from inside a factory or a street gutter discharges into a sewer, to catch bulky matters which would not pass readily through the sewer.

**Center pivot irrigation** – An automated sprinkler system involving a rotating pipe or boom that supplies water to a circular area of an agricultural field through sprinkler heads or nozzles.

**CERCLA** – See Comprehensive Environmental Response, Compensation, and Liability Act

**Channel scour** – Erosion by flowing water and sediment on a stream channel; results in removal of mud, silt, and sand on the outside curve of a stream bend and the bed material of a stream channel.

**Channelization** – The straightening and deepening of a stream channel to permit the water to move faster or to drain a wet area for fanning.

**Chlordane** – Octachloro-4, 7-methanotetrahydroindane. An organochlorine insecticide no longer registered for use in the U.S. Technical chlordane is a mixture in which the primary components are cis- and trans-chlordane, cis- and trans-nonachlor, and heptachlor.

**Chlorinated hydrocarbons** – Chemicals containing only chlorine, carbon, and hydrogen. These include some pesticides, such as DDT and heptachlor, and solvents such as trichloroethene and chloroform.

**Chlorinated organics** – See Chlorinated Solvents

**Chlorinated solvent** – A volatile organic compound containing chlorine. Some common solvents are trichloroethylene, tetrachloroethylene, and carbon tetrachloride.

**Chloroform** – A clear, colorless liquid with a characteristic odor. Chloroform was one of the earliest general anesthetics but this use was abandoned due to toxic effects. Now it is widely used as a solvent in the production of lacquer, pharmaceuticals, fluorocarbons, and plastics.

**Chlorofluorocarbons** – A class of volatile compounds consisting of carbon, chlorine, and fluorine. Commonly called freons, which have been in refrigeration mechanisms, as blowing agents in the fabrication of flexible and rigid foams, and, until banned from use several years ago, as propellants in spray cans.

**Chronic effects** – A long-term or repeated reaction that occurs after an exposure to a chemical. Chronic effects are the opposite of acute effects.

**Chrysene** – See Polycyclic aromatic hydrocarbon (PAH).

**Cienaga** – A marshy area where the ground is wet due to the presence of seepage or springs.

**Circumneutral** – Said of water with a pH between 5.5 and 7.4; pH modifier used in the U.S. Fish and Wildlife Service wetland classification system.

**Cirque** – A deep, steep-walled, half-bowl-like recess or hollow situated high on the side of a mountain and commonly at the head of a glacial valley; and produced by the erosive activity of mountain glaciers.

**Citizen participation (CP)** – A process to inform and involve citizens in the decision-making process during identification, assessment and remediation of inactive hazardous waste sites. This process helps to assure that sound decisions are made from environmental, human health, economic, social and political perspectives.

**Citizen participation plan** – A document that describes the site-specific citizen participation activities that will take place to complement the investigation and clean-up activities at a hazardous waste site. A plan may be updated or altered as public interest or the technical aspects of the program change.

**Citizen participation record** – A series of documents prepared at a major remedial stage which describes the citizen participation activities required at that stage. A CP record also directs a scoping process to determine if additional citizen participation activities are appropriate and feasible.

**Citizen participation specialist** – A DEC staff member within the Division of Public Affairs and Education who provides guidance, evaluation and assistance to help the project manager carry out the site-specific citizen participation program.

**Classification** – See Site classification

**Clastic** – Rock, such as sandstone, or sediment composed principally of broken fragments that are derived from preexisting rocks which have been transported from their place of origin.

**Cleanup** – Action taken to respond to a hazardous material release or threat of a release that could affect humans and/or the environment. Also called remedial action, removal action, response action, or corrective action.

**Climate** – The sum total of the meteorological elements that characterize the average and extreme conditions of the atmosphere over a long period of time at any one place or region of the Earth's surface.

**Combined sewer overflow** – A discharge of untreated sewage and stormwater to a stream when the capacity of a combined storm/sanitary sewer system is exceeded by storm runoff.

**Combustion** – Burning.

**Comment period** – A time period for the public to review and comment on various documents and Division of Environmental

Remediation (DER) actions. For example, a 30 day comment period is provided when DER issues a Proposed Remedial Action Plan (PRAP).

**Commercial withdrawals** – Water for use by motels, hotels, restaurants, office buildings, commercial facilities, and civilian and military institutions. The water may be obtained from a public supplier or it may be self-supplied.

**Community** – In ecology, the species that interact in a common area.

**Community relations** – Environmental Protection Agency's program to inform and involve the public in the Superfund process and respond to community concerns.

**Community relations plan (CRP)** – The formal plan for Environmental Protection Agency community relations activities at a Superfund site. The CRP is designed to ensure citizen opportunities for public involvement and allow citizens the opportunity to learn about a site.

**Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA)** – A Federal law passed in 1980 and modified in 1986 by the Superfund Amendments and Reauthorization Act. CERCLA created a special tax that goes into a trust fund, commonly known as Superfund, to investigate and clean up abandoned or uncontrolled hazardous waste sites. Under the program, EPA can either pay for site cleanup when parties responsible for the contamination cannot be located or are unwilling or unable to perform the work; or take legal action to force parties responsible for site contamination to clean up the site or reimburse the government for the cost of cleanup.

**Concentration** – The amount of one substance in another substance. For example, a concentration of 10 milligrams per liter means there are 10 milligrams of a substance in 1 liter of another substance.

**Conceptual design** – The general outline of planned actions that will be taken to address a hazardous waste site, such as building a landfill cover system. The conceptual design is incorporated into detailed design documents during Remedial Design.

**Cone of depression** – The depression of heads around a pumping well caused by withdrawal of water.

**Confined aquifer (artesian aquifer)** – An aquifer that is completely filled with water under pressure and that is overlain by material that restricts the movement of water.

**Confining layer (confining bed)** – A layer or bed of impermeable or distinctly less permeable material lying below or above one or more aquifers. When the confining layer lies between two aquifers, it keeps water from the upper aquifer separated, or confined, from water in the lower aquifer.

**Confluence** – The flowing together of two or more streams; the place where a tributary joins the main stream.

**Conglomerate** – A coarse-grained sedimentary rock composed of fragments larger than 2 millimeters in diameter.

**Consent order** – A legal and enforceable negotiated agreement between DEC and responsible parties where responsible parties agree to undertake investigation and cleanup or pay for the costs of investigation and cleanup work at a site. Also called an "Order on Consent."

**Constituent** – A chemical or biological substance in water, sediment, or biota that can be measured by an analytical method.

**Construction and demolition (C&D) debris/waste** – Waste building materials, dredging materials, tree stumps, and rubble resulting from construction, remodeling, repair, and demolition of homes, commercial buildings and other structures and pavements.

**Consumptive use** – The quantity of water that is not available for immediate reuse because it has been evaporated, transpired, or incorporated into products, plant tissue, or animal tissue. Also referred to as water consumption.

**Contact list** – Names, addresses and/or telephone numbers of individuals, groups, organizations and media interested and/or affected by a particular hazardous waste site. The DEC mails site-related information to the contact list, also called a mailing list.

**Contact recreation** – Recreational activities, such as swimming and kayaking, in which contact with water is prolonged or intimate, and in which there is a likelihood of ingesting water.

**Contaminant** – Any physical, chemical, biological, or radiological substance or matter that has an adverse effect on air, water, or soil.

**Contamination** – Microorganisms, chemicals, toxic substances, wastes, or wastewater introduced into water, air, or soil in a concentration that makes the medium unfit for its next intended use. Objects such as building surfaces can also contain contamination.

**Contaminant mass** – The volume and area of contaminants in a polluted material, such as soil or groundwater. The goal of waste cleanup is to reduce the contaminant mass (e.g., reduce the amount and area of contaminants in soil).

**Contaminant plume** – *see* Plume

**Contract Laboratory Program (CLP)** – The Environmental Protection Agency's program that approves laboratories that provide chemical testing services of known quality using a wide range of standard methods and maintaining consistent quality control.

**Contributing area** – The area in a drainage basin that contributes water to streamflow or recharge to an aquifer.

**Coral reef** – A ridge of limestone composed chiefly of coral, coral sands, and solid limestone resulting from organic secretion of calcium carbonate; occur along continents and islands where the temperature is generally above 18°C.

**Core sample** – A sample of rock, soil, or other material obtained by driving a hollow tube into the undisturbed medium and withdrawing it with its contained sample.

**Corrosive** – Having the power to degrade or wear away a material by chemical action.

**Cost recovery** – A legal process where potentially responsible parties can be required to pay back the federal or state government for money spent on cleanup action. Cost recovery actions usually begin after the government has completed a site cleanup.

**Cover material** – (1) Soil used to cover compacted solid waste in a sanitary landfill. (2) *See* Landfill cap/landfill cover system.

**Cover system** – *See* Landfill cap/landfill cover system

**Criterion** – A standard rule or test on which a judgment or decision can be based.

**Crystalline rocks** – Rocks (igneous or metamorphic) consisting wholly of crystals or fragments of crystals.

**Cubic foot per second (ft<sup>3</sup>/s, or cfs)** – Rate of water discharge representing a volume of 1 cubic foot passing a given point during 1 second, equivalent to approximately 7.48 gallons per second or 448.8 gallons per minute or 0.02832 cubic meter per second. In a stream channel, a discharge of 1 cubic foot per second is equal to the discharge at a rectangular cross section, 1 foot wide and 1 foot deep, flowing at an average velocity of 1 foot per second.

**Cyclone** – An area of low pressure around which winds rotate counterclockwise in the

Northern Hemisphere and clockwise in the Southern Hemisphere. *See also* Tropical cyclone

**Cypress dome** – Small, isolated, circular, depression, forested wetlands, in which cypress predominates, that have convex silhouettes when viewed from a distance.

## D

**Datum plane** – A horizontal plane to which ground elevations or water surface elevations are referenced.

**DDT-Dichloro-diphenyl-trichloroethane** – An organochlorine insecticide no longer registered for use in the United States.

**Deciduous** – Refers to plants that shed foliage at the end of the growing season.

**Deed notification** – A notice placed on a property deed to alert future buyers about contamination on a property.

**Deed restriction** – A legal restriction placed on a property deed to restrict future uses of a contaminated property. For example, a deed restriction may prohibit future housing development on a contaminated industrial site, or prohibit use of contaminated groundwater on a piece of property.

**Deepwater habitat** – Permanently flooded lands lying below the deepwater boundary of wetlands.

**Degradation products (Daughter products)** – Chlorinated solvents, when released in the environment, will naturally degrade by microbial and physical processes in soil and/or groundwater into similar compounds that have fewer chlorine atoms. These new compounds are known as degradation products. For instance, tetrachloroethylene, which has 4 chlorine atoms, degrades to trichloroethylene, which has only 3 chloride atoms.

**Degraded** – Condition of the quality of water that has been made unfit for some specified purpose.

**Degreaser** – Chemical used to remove grease, usually from metal or plastic.

**Delta** – The low, nearly flat tract of land at or near the mouth of a river, resulting from the accumulation of sediment supplied by the river in such quantities that it is not removed by tides, waves, or currents. Commonly a triangular or fan-shaped plain.

**Denitrification** – A process by which oxidized forms of nitrogen such as nitrate (NO<sub>3</sub><sup>-</sup>) are reduced to form nitrites, nitrogen oxides, ammonia, or free nitrogen: commonly brought about by the action of denitrifying bacteria and usually resulting in the escape of nitrogen to the air.

## Dense Non-Aqueous Phase Liquid

**(DNAPL)** – Liquids denser than water that represent a special class of soil and groundwater contaminants with unique behavior and problems. Since they are denser than water, DNAPLs can sink deeper into the ground and can act as a continuing source of groundwater contamination, as small amounts of the material can dissolve in groundwater.

**Density** – The mass of a substance per unit of volume. Substances with a density greater than 1.0 are denser than water; substances with a density less than 1.0 are lighter than water.

**Dermal** – By or through the skin. "Dermal contact" refers to a substance coming in contact with skin.

**Desorption** – The opposite of adsorption or absorption; molecules detach from a surface (such as soil particles).

**Detect** – To determine the presence of a compound.

**Detection limit** – The concentration of a constituent or analytical below which a particular analytical method cannot determine, with a high degree of certainty, the concentration.

**Dewater** – (1) Remove a portion of the water in soil or sludge to dry the soil/sludge so it can be treated or disposed of. (2) Remove or drain the water from a tank or trench.

**Diatoms** – Single-celled, colonial, or filamentous algae with siliceous cell walls constructed of two overlapping parts.

**Dieldrin** – An organochlorine insecticide no longer registered for use in the United States. Also a degradation product of the insecticide aldrin.

**1,1-Dichloroethane (1,1-DCA) and 1,2-Dichloroethane (1,2-DCA)** – Chemicals with similar molecular structures used to produce a variety of consumer and industrial products, such as specialty chemicals and cleaning products. These chemicals are sometime found at hazardous waste sites as the degradation products of other chemicals, such as trichloroethane.

**Dichloroethene (DCE) or 1,1-Dichloroethene and 1,2-Dichloroethene** – Chemicals with similar molecular structures used to make specialty chemicals and pharmaceuticals. These chemicals are sometimes found at hazardous waste sites as the degradation products of trichloroethene.

**Diffusion** – Movement of a substance from an area of high concentration to an area of low concentration. Diffusion can also refer

molecules of gas or vapor moving from a source, such as a bottle, to a receptor, such as a human nose.

**Direct runoff** – The runoff entering stream channels promptly after rainfall or snowmelt.

**Discharge** – The volume of fluid passing a point per unit of time, commonly expressed in cubic feet per second, million gallons per day, gallons per minute, or seconds per minute per day.

**Discharge area (groundwater)** – Area where subsurface water is discharged to the land surface, to surface water, or to the atmosphere.

**Dispersion** – The extent to which a liquid substance introduced into a groundwater system spreads as it moves through the system.

**Dissected** – Cut by erosion into valleys, hills, and upland plains.

**Dissolved constituent** – Operationally defined as a constituent that passes through a 0.45-micrometer filter.

**Dissolved oxygen** – Oxygen dissolved in water; one of the most important indicators of the condition of a water body. Dissolved oxygen is necessary for the life of fish and most other aquatic organisms.

**Dissolved solids** – Minerals and organic matter dissolved in water.

**Diversion** – A turning aside or alteration of the natural course of a flow of water, normally considered physically to leave the natural channel. In some States, this can be a consumptive use direct from another stream, such as by livestock watering. In other States, a diversion must consist of such actions as taking water through a canal, pipe, or conduit.

**Division of Environmental Enforcement** – A unit within the DEC which works with the Division of Environmental Remediation to negotiate agreements with responsible parties for the investigation and remediation of hazardous waste sites. A negotiated agreement is contained in a consent order.

**Division of Environmental Remediation** – Formerly the Division of Hazardous Waste Remediation, a major unit within the DEC created to manage the hazardous waste site remedial program from site discovery through Operation and Maintenance activities. Staff include: engineers, geologists, chemists, attorneys, citizen participation specialists, environmental program specialists and support staff.

**Document Repository** – Typically, a DEC regional office and/or a public building, such as a library, near a particular site, at which documents related to remedial and citizen participation activities at the site are available for public review. Environmental Management Councils (EMCs), Conservation Advisory Committees (CACs) and active local groups can also serve as document repositories.

**Dolomite** – A sedimentary rock consisting chiefly of magnesium carbonate.

**Domestic withdrawals** – Water used for normal household purposes, such as drinking, food preparation, bathing, washing clothes and dishes, flushing toilets, and watering lawns and gardens. The water may be obtained from a public supplier or may be self-supplied. Also called residential water use.

**Dominant plant** – The plant species controlling the environment.

**Downgradient** – The direction that groundwater flows; similar to “downstream” for surface water.

**Drainage area** – The drainage area of a stream at a specified location is that area, measured in a horizontal plane, which is enclosed by a drainage divide.

**Drainage basin** – The land area drained by a river or stream.

**Drainage divide** – Boundary between adjoining drainage basins.

**Drainage Swale** – See Swale

**Drawdown** – The difference between the water level in a well before pumping and the water level in the well during pumping. Also, for flowing wells, the reduction of the pressure head as a result of the discharge of water.

**Drinking-water standard or guideline** – A threshold concentration for a constituent or compound in a public drinking-water supply, designed to protect human health. As defined here, standards are U.S. Environmental Protection Agency regulations that specify the maximum contamination levels for public water systems required to protect the public welfare; guidelines have no regulatory status and are issued in an advisory capacity.

**Drip irrigation** – An irrigation system in which water is applied directly to the root zone of plants by means of applicators (orifices, emitters, porous tubing, or perforated pipe) operated under low pressure. The applicators can be placed on or below the surface of the ground or can be suspended from supports.

**Drought** – A prolonged period of less-than-normal precipitation such that the lack of water causes a serious hydrologic imbalance.

**Drum** – A metal or plastic container, usually with a 55 gallon capacity.

**Drywell** – A hole dug to a depth above the water table so that its bottom and sides are typically dry except when receiving fluid discharged from an industrial process. Is often filled with gravel or is reinforced with concrete blocks to form a chamber.

**Dual-Phase Vacuum Extraction System** – A treatment system designed to remove both contaminated groundwater and soil gas from a common groundwater well or wells. By removing groundwater, the system lowers the groundwater level around the well, allowing a strong vacuum to be applied to remove contaminated soil gas. The contaminated water and air can then be removed or treated and released.

**Duplicate Sample** – A sample taken at the same location as another sample. Both samples are tested for chemicals. Taking a duplicate sample helps to ensure that testing procedures are precise: because the samples were taken in the same location, the samples should contain similar levels of chemicals.

## E

**Ecological studies** – Studies of biological communities and habitat characteristics in NAWQA Study Units to evaluate the effects of physical and chemical characteristics of water and hydrologic conditions on aquatic biota and to determine how biological and habitat characteristics differ among environmental settings.

**Ecoregion** – An area of similar climate, landform, soil, potential natural vegetation, hydrology, or other ecologically relevant variables.

**Ecosystem** – A community of organisms considered together with the nonliving factors of its environment.

**Effluent** – Outflow from a particular source, such as a stream that flows from a lake or liquid waste that flows from a factory or sewage-treatment plant.

**Emergent plants** – Erect, rooted, herbaceous plants that may be temporarily or permanently flooded at the base but do not tolerate prolonged inundation of the entire plant.

**Endangered species** – A species that is in imminent danger of becoming extinct.

**Endocrine system** – The collection of ductless glands in animals that secrete hormones, which influence growth, gender and sexual maturity.

**Enforcement** – DEC's efforts, through legal action if necessary, to compel a responsible party to perform or pay for site remedial activities.

**Engineered/engineering controls** – Method of managing environmental and health risks by placing a barrier between the contamination and the rest of the site, thus limiting exposure pathways.

**Environment** – The sum of all conditions and influences affecting the life of organisms.

**Environmental framework** – Natural and human-related features of the land and hydrologic system, such as geology, land use, and habitat that provide a unifying framework for making comparative assessments of the factors that govern water-quality conditions within and among NAWQA Study Units.

**Environmental Notice Bulletin** – A weekly DEC publication used to announce a variety of DEC activities. The ENB announces proposals to delist or change the site classification of hazardous waste sites, as well as voluntary cleanup agreements.

**Environmental Restoration Program/Project** – See Brownfield

**Environmental sample** – A water sample collected from an aquifer or stream for the purpose of chemical, physical, or biological characterization of the sampled resource.

**Environmental setting** – Land area characterized by a unique combination of natural and human-related factors, such as row-crop cultivation or glacial-till soils.

**Ephemeral stream** – A stream or part of a stream that flows only in direct response to precipitation; it receives little or no water from springs, melting snow, or other sources; its channel is at all times above the water table.

**Epidemiology** – The study of diseases as they affect population, including the distribution of disease, the factors (e.g., age, sex, occupation) that influence this distribution; and the application of this study to control health problems.

**EP Tox Test** – See Extraction Procedure

**EPT richness index** – An index based on the sum of the number of taxa in three insect orders, Ephemeroptera (mayflies), Plecoptera (stoneflies), and Trichoptera (caddisflies), that are composed primarily of species considered to be relatively intolerant to environmental alterations.

**Equal-width increment (EVM sample)** – A composite sample of water collected across a section of stream with equal spacing between verticals, and equal transit rates within each vertical that yields a representative sample of stream conditions.

**Erosion** – The process whereby materials of the Earth's crust are loosened, dissolved, or worn away and simultaneously moved from one place to another.

**Estuarine wetlands** – Tidal wetlands in low-wave-energy environments where the salinity of the water is greater than 0.5 part per thousand and is variable owing to evaporation and the mixing of seawater and freshwater; tidal wetlands of coastal rivers and embayments, salty tidal marshes, mangrove swamps, and tidal flats.

**Estuary** – Area where the current of a stream meets the ocean and where tidal effects are evident; an arm of the ocean at the lower end of a river.

**Eutrophication** – The process by which water becomes enriched with plant nutrients, most commonly phosphorus and nitrogen.

**Evaporation** – The process by which water is changed to gas or vapor; occurs directly from water surfaces and from the soil.

**Evaporite minerals (deposits)** – Minerals or deposits of minerals formed by evaporation of water containing salts. These deposits are common in arid climates.

**Evaporites** – A class of sedimentary rocks composed primarily of minerals precipitated from a saline solution as a result of extensive or total evaporation of water.

**Evapotranspiration** – The process by which water is discharged to the atmosphere as a result of evaporation from the soil and surface-water bodies, and transpiration by plants.

**Exceedance** – Violation of the pollutant levels permitted by environmental protection standards.

**Explanation of Significant Differences (ESD)** – A document prepared by the Division of Environmental Remediation explaining changes to a cleanup plan called for in a Record of Decision and the reason for those changes.

**Explosive limits** – The amounts of vapor in air which form explosive mixtures. Explosive limits are expressed as "lower explosive limits" and "upper explosive limits;" these give the range of vapor concentrations in air that will explode if heat is added. Explosive limits are expressed as percent of vapor in air.

**Exposure** – Contact. No matter how dangerous a substance or activity, without exposure, it cannot harm you.

**Exposure routes** – A means by which a toxic substance can come into contact with or enter the body. The three major exposure routes are: inhalation (breathing), direct contact (touching), and ingestion (swallowing).

**Exotic species** – Plants or animals not native to the area.

**Ex-situ** – Outside the original location. For example, contaminated soil that is dug up and removed before it is treated is being treated ex-situ. This is the opposite of in-situ.

**Extraction procedure (EP Tox Test)** – Determining toxicity by a procedure which simulates leaching; if a certain concentration of a toxic substance can be leached from a waste, that waste is considered hazardous, i.e., "EP Toxic."

**Extraction well** – A discharge well used to remove contaminated groundwater or air.

## F

**Fall line** – Imaginary line marking the boundary between the ancient resistant crystalline rocks of the Piedmont province of the Appalachian Mountains, and the younger, softer sediments of the Atlantic Coastal Plain province in the Eastern United States. Along rivers, this line commonly is reflected by waterfalls.

**Fallow** – Cropland, tilled or untilled, allowed to lie idle during the whole or greater part of the growing season.

**Fecal bacteria** – Microscopic single-celled organisms (primarily fecal coliforms and fecal streptococci) found in the wastes of warm-blooded animals. Their presence in water is used to assess the sanitary quality of water for body-contact recreation or for consumption. Their presence indicates contamination by the wastes of warm-blooded animals and the possible presence of pathogenic (disease producing) organisms.

**Fecal coliform** – See Fecal bacteria.

**FDA action level** – A regulatory level recommended by the U.S. Environmental Protection Agency for enforcement by the Food and Drug Administration (FDA) when pesticide residues occur in food commodities for reasons other than the direct application of the pesticide. Action levels are set for inadvertent pesticide residues resulting from previous legal use or accidental contamination. Applies to edible portions of fish and shellfish in interstate commerce.

**Feasibility Study (FS)** – A report examining the pros and cons of alternative methods to address contamination at a hazardous waste site. The feasibility study usually recommends a certain alternative. The FS is usually based on the results of a remedial investigation; together, they are commonly referred to as the RI/FS.

**Federal Register** – A weekly publication covering federal government activity including rule making, proposed plans, response to public comments, etc.

**Fen** – Peat-accumulating wetland that generally receives water from surface runoff and (or) seepage from mineral soils in addition to direct precipitation; generally alkaline; or slightly acid.

**Fertilizer** – Any of a large number of natural or synthetic materials, including manure and nitrogen, phosphorus, and potassium compounds, spread on or worked into soil to increase its fertility.

**Fill** – Man-made deposits of natural soils or rock products and waste materials.

**Filtrate** – Liquid that has been passed through a filter.

**Fish and wildlife impact analysis** – Part of a remedial investigation that looks at the effects or potential effects of contamination on fish and wildlife.

**Fish community** – See Community

**Fixed Sites** – Monitoring sites in NAWQA Study Units at which the most comprehensive suites of data are collected. *See also* Basic Fixed Sites and Intensive Fixed Sites.

**Flammable** – Catches on fire easily and burns rapidly.

**Flash point** – The lowest temperature at which the vapor of a substance will catch on fire, even momentarily, if heat is applied. Provides an indication of how flammable a substance is.

**Flood** – Any relatively high streamflow that overflows the natural or artificial banks of a stream.

**Flood attenuation** – a weakening or reduction in the force or intensity of a flood.

**Flood irrigation** – The application of irrigation water whereby the entire surface of the soil is covered by ponded water.

**Flood plain** – A strip of relatively flat land bordering a stream channel that is inundated at times of high water.

**Flow line** – The idealized path followed by particles of water.

**Flowpath** – An underground route for groundwater movement extending from a recharge (intake) zone to a discharge (output) zone such as a shallow stream.

**Fluvial** – Pertaining to a river or stream.

**Fluvial deposit** – A sedimentary deposit consisting of material transported by suspension or laid down by a river or stream.

**Flyway** – A specific air route taken by birds during migration.

**Freshwater** – Water that contains less than 1,000 milligrams per liter of dissolved solids.

**Freshwater chronic criteria** – The highest concentration of a contaminant that freshwater aquatic organisms can be exposed to for an extended period of time (4 days) without adverse effects. *See also* Water-quality criteria .

**Friable** – Descriptive of a rock or mineral that crumbles naturally or is easily broken, pulverized, or reduced to powder.

**Fumigant** – A substance or mixture of substances that produces gas, vapor, fume, or smoke intended to destroy insects, bacteria, or rodents.

**Furrow irrigation** – A type of surface irrigation whereby water is applied at the upper (higher) end of a field and flows in furrows to the lower end.

## G

**Gage height** – *See* Stage

**Gaging station** – A particular site on a stream, canal, lake, or reservoir where systematic observations of hydrologic data are obtained.

**Gas venting system** – A system of pipes and vents installed in a landfill to prevent the build up of landfill gases, such as methane, that could potentially explode. Sometimes the gas vents have flares on them to burn the gas as it is released into the atmosphere. At some very large landfills, the gas is collected and used to generate electricity.

**Geomembrane** – A low permeability plastic sheet that is placed over a landfill to deter rain and snow from entering a landfill's waste. Geomembranes are often made from a plastic called HDPE (high density polyurethane). The geomembrane is covered with soil (barrier protection layer) and top soil to protect it.

**Geomorphic** – Pertaining to the form or general configuration of the Earth or of its surface features.

**Geomorphology** – The science that treats the general configuration of the Earth's surface; the description of landforms.

**Geoprobe™** – A special machine used to make soil borings and to create temporary groundwater monitoring wells.

**Geothermal** – Relating to the Earth's internal heat; commonly applied to springs or vents discharging hot water or steam.

**Glacial** – Of or relating to the presence and activities of ice or glaciers.

**Glacial drift** – A general term for rock material transported by glaciers or icebergs and deposited directly on land or in the sea.

**Glacial lake** – A lake that derives its water, or much of its water, from the melting of glacial ice; also a lake that occupies a basin produced by glacial erosion.

**Glacial outwash** – Stratified detritus (chiefly sand and gravel) "washed out" from a glacier by meltwater streams and deposited in front of or beyond the end moraine or the margin of an active glacier.

**Gram(g)** – The unit of mass in the metric system. An ounce is about 28 grams, and a pound is approximately 450 grams.

**Granite/Granitic rock** – A coarse-grained igneous rock.

**Granular activated carbon treatment** – A filtering system often used in small water systems and individual homes to remove organic compounds. *See* Activated carbon.

**Groundwater** – Water found beneath the earth's surface that fills pores between soil particles such as sand, clay, and gravel or that fills cracks in bedrock. Precipitation that does not evaporate or runoff to surface waters percolates downward through soil and becomes groundwater. Groundwater flows from areas of high elevation to low elevation at generally low velocities (usually ranging from 10-1000 feet/year) and eventually discharges into surface waters such as rivers, lakes, and wetlands. Groundwater often provides a source of drinking water via wells. The chemical composition of the groundwater reflects the soil or bedrock through which it passes; groundwater dissolves minerals in the soil and bedrock. If a source of contamination exists at or below the earth's surface, percolating rainfall or snowmelt can transport contaminants downward where they can migrate with the groundwater.

**Groundwater collection/extraction and treatment system** – A system of wells fitted with pumps and piping used to pump out or extract contaminated groundwater from the subsurface. Properly designed and operated systems can effectively contain a groundwater contaminant plume and prevent further contaminant migration.

**Groundwater flow system** – The underground pathway by which groundwater moves from areas of recharge to areas of discharge.

**Groundwater table** – See Water Table

**Growing season** – The frost-free period of the year.

**H**

**Habitat** – The part of the physical environment in which a plant or animal lives.

**Half-life** – **1)** The time required for a pollutant to lose half its effect on the environment. **2)** The time required for half of the atoms of a radioactive element to undergo decay. **3)** The time required for the elimination of one half a total dose from the body.

**Hammer mill** – A high-speed machine that uses hammers and cutters to crush, grind, chip, or shred solid waste.

**Hardness** – A property of water that causes the formation of an insoluble residue when the water is used with soap and a scale in vessels in which water has been allowed to evaporate. It is due primarily to the presence of ions of calcium and magnesium. Generally expressed as milligrams per liter as calcium carbonate (CaCO<sub>3</sub>). A general hardness scale follows:

Description	Milligrams per liter as CaCO <sub>3</sub>
Soft	0-60
Moderately hard	61-120
Hard	121-180
Very hard	more than 180

**Hardpan** – A relatively hard, impervious, and usually clayey layer of soil lying at or just below land surface; produced as a result of cementation by precipitation of insoluble minerals.

**Hazardous ranking system (HRS)** – A scoring system used to evaluate potential relative risks to public health and the environment from releases or threatened releases of hazardous materials. EPA and States use the HRS to calculate a site score (0 to 100) based on the actual or potential release of hazardous materials from a site through air, surface water, or groundwater. This score is the primary factor used to decide if a hazardous waste site should be placed on the National Priorities List.

**Hazardous Substance** – **1)** Under the Comprehensive Environmental Response, Compensation, and Liability Act, a hazardous substance is any element, compound, mixture, solution, or substance that, when released to the environment, may present a substantial danger to the public health or welfare or to the environment, including, but not limited to, toxic and certain other pollutants under the Federal Water Pollution Control Act, Resource Conservation and Recovery Act, hazardous

air pollutants regulated by parts of the Clean Air Act, and Toxic Substance Control Act. The term is much broader than the term hazardous waste. **2)** Any substance designated reportable by the EPA if a designated quantity of the substance is spilled in the waters of the United States or if it is otherwise emitted to the environment.

**Hazardous Substance Site** – A site that contains hazardous substances but does not contain hazardous waste.

**Hazardous waste(s)** – By-products of society that can pose a substantial or potential hazard to human health or the environment when improperly managed. To be considered hazardous waste, the waste must possess at least one of four characteristics (ignitability, corrosivity, reactivity, or toxicity) or appear on special EPA lists.

**Hazardous waste site** – A place where hazardous wastes have been dumped, buried or improperly stored. Sites range from a crest of land containing thousands of tons of chemical wastes to a few drums of solvents dumped in a vacant lot. See also Inactive hazardous waste disposal site.

**Headwaters** – The source and upper part of a stream.

**Health advisory** – Nonregulatory levels of contaminants in drinking water that may be used as guidance in the absence of regulatory limits. Advisories consist of estimates of concentrations that would result in no known or anticipated health effects (for carcinogens, a specified cancer risk) determined for a child or for an adult for various exposure periods.

**Health and safety plan** – A plan included in investigation or cleanup work plans which outlines protective measures for site workers and the community during investigation or cleanup activities.

**Health hazard** – Anything which can have harmful effects on health. There can be both acute and chronic health hazards.

**Health risk assessment** – A process which estimates the likelihood that people who could be exposed to chemicals may have health effects. The four steps of a risk assessment are: **1)** hazard identification (Can this substance damage health?), **2)** dose-response assessment (What dose causes what effect?), **3)** exposure assessment (How and how much do people contact it?), and **4)** risk characterization (combining the other three steps to estimate risk).

**Heavy metals** – Metals with high atomic weights, such as mercury, chromium, cadmium, arsenic, and lead. They can damage living things at low concentrations and tend to accumulate in the food chain.

**Herbaceous** – With characteristics of an herb; a plant with no persistent woody stem above ground.

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

**Heterogeneous** – Consisting of dissimilar ingredients or constituents.

**Homogeneous** – Having a uniform consistency or ingredients; composed of similar ingredients.

**Human health advisory** – Guidance provided by U.S. Environmental Protection Agency, State agencies or scientific organizations, in the absence of regulatory limits, to describe acceptable contaminant levels in drinking water or edible fish.

**Hydraulic conductivity** – The capacity of a rock to transmit water. It is expressed as the volume of water at the existing kinematic viscosity that will move in unit time under a unit hydraulic gradient through a unit area measured at right angles to the direction of flow.

**Hydraulic gradient** – In general, the direction of groundwater flow due to changes in the depth of the water table. Just as water flows downhill, water in the ground moves from areas of high elevation to areas of low elevation. The slope of the water table is the hydraulic gradient. The hydraulic gradient determines the speed of groundwater flow. A steep gradient causes groundwater to move faster than a nearly horizontal gradient.

**Hydraulic head** – The height of the free surface of a body of water above a given point beneath the surface.

**Hydric soil** – Soil that is wet long enough to periodically produce anaerobic conditions, thereby influencing the growth of plants.

**Hydrograph** – Graph showing variation of water elevation, velocity, streamflow, or other property of water with respect to time.

**Hydrocarbon** – Any of a series of chemical compounds that consist entirely of carbon and hydrogen.

**Hydrogen Release Compound (HRC™)** – Hydrogen Release Compound (HRC™) is a passive treatment option for bioremediation of chlorinated solvents. HRC™ is injected into contaminated soils. Naturally occurring microbes metabolize lactic acid released by HRC™, and produce hydrogen. The resulting hydrogen can be used to break down the chlorinated solvents. The process requires anaerobic conditions. Major target compounds include perch-

chloroethene, trichloroethene, and trichloroethane as well as their breakdown products.

**Hydrogeologic testing** – Physical tests performed to obtain specific groundwater and geologic data. A pump test, for example, is used to determine the permeability (a measure of how readily groundwater flows) and storage capacity (a measure of the amount of water available) of an aquifer.

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

**Hydrologic cycle** – The circulation of water from the sea, through the atmosphere, to the land, and thence back to the sea by overland and subterranean routes.

**Hydrologic unit** – A geographic area representing part or all of a surface drainage basin or distinct hydrologic feature as delineated by the U. S. Geological Survey on State Hydrologic Unit Maps. Each hydrologic unit is assigned a hierarchical hydrologic unit code consisting of 2 digits for each successively smaller drainage basin unit.

**Hydrologic regime** – The characteristic behavior and total quantity of water involved in a drainage basin.

**Hydrology** – The science that deals with water as it occurs in the atmosphere, on the surface of the ground, and underground.

**Hydrophobic** – Not capable of uniting with or absorbing water.

**Hydrophyte** – Any plant growing in water or on a substrate that is at least periodically deficient in oxygen as a result of excessive water content.

**Hydrostatic pressure** – The pressure exerted by the water at any given point in a body of water at rest.

**Igneous rocks** – Rocks that have solidified from molten or partly molten material.

**Immobilize** – To hold by a strong chemical attraction.

**Impaired** – Condition of the quality of water that has been adversely affected for a specific use by contamination or pollution.

**Impermeable** – Unable to be penetrated, as by liquids. For example, an “impermeable membrane” can be a thin plastic sheet through which rainwater cannot move.

**Impermeability** – The incapacity of a rock to transmit a fluid.

**Impervious** – Impermeable. *See* Impermeability.

**Inactive hazardous waste disposal site** – A hazardous waste site where disposal of hazardous wastes has been confirmed and wastes are no longer being disposed of there (“inactive” site).

**Incineration** – Burning of certain types of solid, liquid, or gaseous materials under controlled conditions to destroy hazardous wastes.

**Index of Biotic Integrity (IBI)** – An aggregated number, or index, based on several attributes or metrics of a fish community that provides an assessment of biological conditions.

**Indicator sites** – Stream sampling sites (in NAWQA Study Units) located at outlets of drainage basins with relatively homogeneous land use and physiographic conditions; most indicator-site basins have drainage areas ranging from 20 to 200 square miles.

**Indurated** – Cemented, hardened, or a rocklike condition.

**Industrial withdrawals** – Water withdrawn for or used for thermoelectric power (electric utility generation) and other industrial and manufacturing uses such as steel, chemical and allied products, paper and allied products, mining, and petroleum refining. The water may be obtained from a public supplier or may be self-supplied.

**Infiltration** – The downward movement of water from the atmosphere into soil or porous rock.

**Influent** – Water, wastewater, or other liquid flowing into a reservoir, basin, or treatment plant. The opposite of effluent.

**Ingestion** – Swallowing. This is one way a person can be exposed to chemicals.

**Inhalation** – Breathing. This is one way a person can be exposed to chemicals.

**Inorganic** – Containing no carbon; matter other than plant or animal.

**Inorganic chemicals/compounds** – Chemicals that do not contain carbon. Metals are inorganic chemicals.

**Inorganic soil** – Soil with less than 20 percent organic matter in the upper 16 inches.

**Insecticide** – A substance or mixture of substances intended to destroy or repel insects.

**In-Situ** – In the original place. In-situ treatment is carried out at a hazardous waste site without having to dig up and move the contaminated material. In-situ is the opposite of ex-situ.

**Insoluble** – Incapable of being dissolved in water or another liquid.

**Instantaneous discharge** – The volume of water that passes a point at a particular instant of time.

**Interim remedial measure(s) (IRM)** – Action(s) that can be conducted at a site relatively quickly to reduce the risk to people’s health and the environment from a well-defined hazardous waste problem. An IRM can involve removing contaminated soil and drums, providing alternative water supplies or securing a site to prevent access.

**Institutional controls** – A variety of methods used to control access to a contaminated site and/or exposure to contaminants at a site. Examples of institutional controls include fencing or deed notifications/restrictions.

**Instream use** – Water use taking place within the stream channel for such purposes as hydroelectric power generation, navigation, water-quality improvement, fish propagation, and recreation. Sometimes called nonwithdrawal use or in-channel use.

**Integrated drainage** – Drainage developed during geomorphic maturity in an arid region, characterized by coalescence of drainage basins as a result of headward erosion in the lower basins or spilling over from the upper basins.

**Integrator or Mixed-use site** – Stream sampling site (in a NAWQA Study Unit) located at an outlet of a drainage basin that contains multiple environmental settings. Most integrator sites are on major streams with relatively large drainage areas.

**Intensive Fixed Sites** – Basic Fixed Sites with increased sampling frequency during selected seasonal periods and analysis of dissolved pesticides for 1 year. Most NAWQA Study Units have one to two integrator Intensive Fixed Sites and one to four indicator Intensive Fixed Sites.

**Interface** – In hydrology, the contact zone between two fluids of different chemical or physical makeup.

**Intermittent stream** – A stream that flows only when it receives water from rainfall runoff or springs, or from some surface source such as melting snow.

**Intermontane** – Situated between or surrounded by mountains, mountain ranges, or mountainous regions.

**Internal drainage** – Surface drainage whereby the water does not reach the ocean, such as drainage toward the lowermost or central part of an interior basin or closed depression.

**Intertidal** – Alternately flooded and exposed by tides.

**Intolerant organisms** – Organisms that are not adaptable to human alterations to the environment and thus decline in numbers where alterations occur. See also Tolerant species.

**Invertebrate** – An animal having no backbone or spinal column. See also Benthic invertebrate.

**Ion** – A positively or negatively charged atom or group of atoms.

**Irrigation** – Controlled application of water to arable land to supply requirements of crops not satisfied by rainfall.

**Irrigation district** – In the United States, a cooperative, self-governing public corporation set up as a subdivision of the state, with definite geographic boundaries, organized to obtain and distribute water for irrigation of lands within the district; created under authority of the State legislature with the consent of a designated fraction of the land owners or citizens and the taxing power.

**Irrigation return flow** – The part of irrigation applied to the surface that is not consumed by evapotranspiration or uptake by plants and that migrates to an aquifer or surface-water body.

**Irrigation withdrawals** – Withdrawals of water for application on land to assist in the growing of crops and pastures or to maintain recreational lands.

**K**

**Karst** – A type of topography that results from dissolution and collapse of carbonate rocks such as limestone, dolomite, and gypsum, and that is characterized by closed depressions or sinkholes, caves, and underground drainage.

**Kettle** – A steep-sided hole or depression, commonly without surface drainage, formed by the melting of a large detached block of stagnant ice that had been buried in the glacial drift.

**Kettle lake** – A body of water occupying a kettle, as in a pitted outwash plain or in a kettle moraine.

**Kill** – Dutch term for stream or creek.

**L**

**Lacustrine** – Pertaining to, produced by, or formed in a lake.

**Lacustrine wetlands** – Wetlands within a lake or reservoir greater than 20 acres or within a lake or reservoir less than 20 acres if the water is greater than 2 meters deep in the deepest part of the basin; ocean-derived salinity is less than 0.5 part per thousand.

**Lagoon** – A shallow stretch of seawater (or lakewater) near or communicating with the sea (or lake) and partly or completely separated from it by a low, narrow, elongate strip of land.

**Land Disposal Restrictions (LDR's)** – Federal rules that require hazardous wastes to be treated before disposal on land to destroy or immobilize hazardous constituents that might migrate into soil and groundwater.

**Landfill** – Any place where wastes were disposed of by dumping waste and covering it. There are three main kinds of landfills:

- 1) Sanitary landfills are disposal sites for nonhazardous solid wastes at which the waste is spread in layers, compacted to the smallest practical volume, and covered with material at the end of each operating day.
- 2) Secure chemical landfills are disposal sites for hazardous waste. They are selected and designed to minimize the chance of release of hazardous substances into the environment.
- 3) Old landfills were built without modern day protections; these may contain hazardous wastes. Many of these landfills are being investigated and cleaned up under the State's remediation program.

**Landfill cap/landfill cover system** – A layering of material over a landfill to deter rain and snowmelt from moving through the waste pile. A typical landfill cover will include a geomembrane or a layer of clay covered with a layer of low permeability soil, which in turn is covered by a layer of topsoil and seeded to encourage grass to grow. Landfill cover systems can also include gas vents to prevent gases such as methane from building up inside the landfill. The cover system is designed so rain and snowmelt is directed into a drainage ditch or swale.

**Landfill gas** – As organic wastes within a landfill break down, gases such as methane and hydrogen sulfide are produced. The production of these gases drops off over time.

**Land-use study** – A network of existing shallow wells in an area having a relatively uniform land use. These studies are a subset of a NAWQA Study-Unit Survey and have the goal of relating the quality of shallow groundwater to land use.

**Latent heat** – The amount of heat given up or absorbed when a substance changes from one state to another, such as from a liquid to a solid.

**Lateral moraine** – A low ridgelike moraine carried on, or deposited near, the side margin of a mountain glacier.

**Leachate** – A liquid that has percolated through soil containing soluble substances and that contains certain amounts of these substances in solution.

**Leachate collection system** – A system that gathers leachate and pumps it to the surface for treatment.

**Leaching** – The removal of materials in solution from soil or rock; also refers to movement of pesticides or nutrients from land surface to groundwater.

**Life zone** – Major area of plant and animal life; region characterized by particular plants and animals and distinguished by temperature differences.

**Light non-aqueous phase liquid (LNAPL)** – Liquids lighter than water that represent a special class of soil and groundwater contaminants with unique behavior and problems. See also NAPL.

**Limestone** – A sedimentary rock consisting chiefly of calcium carbonate, primarily in the form of the mineral calcite.

**Limnetic** – The deepwater zone (greater than 2 meters deep); a subsystem of the Lacustrine System of the U.S. Fish and Wildlife Service wetland classification system.

**Liner** – A relatively impermeable barrier designed to keep leachate inside a landfill. Liner materials include plastic and dense clay.

**List/listing** – When DEC adds a hazardous waste site to the Registry of Inactive Hazardous Waste Disposal Sites, this is called "listing" a site.

**Liter** – The unit of volume in the metric system. A liter is about the same as a quart.

**Littoral** – The shallow-water zone (less than 2 meters deep); a subsystem of the Lacustrine System of the U.S. Fish and Wildlife Service wetland classification system.

**Load** – Material that is moved or carried by streams, reported as weight of material transported during a specified time period, such as tons per year.

**Loess** – A widespread, homogeneous, commonly nonstratified, porous, friable, slightly coherent, fine-grained blanket deposit of wind-blown and wind-deposited silt and fine sand.

**Long-term monitoring** – The collection of data over a period of years or decades to assess changes in selected hydrologic conditions.

**Low Temperature Thermal Desorption** – The process of heating soil anywhere between 200 and 1000°F in order to vaporize contaminants with low boiling points.

The vaporized contaminants are collected and treated. The low temperatures requires less fuel than other treatment methods.

## M

### **Magnetometer/magnetometer survey** –

A magnetometer is an instrument that can detect metal objects buried underground. When this instrument is used to look for buried drums or other metal objects at a hazardous waste site, this is called a magnetometer survey.

**Main stem** – The principal trunk of a river or a stream.

**Major ions** – Constituents commonly present in water in concentrations exceeding 1.0 milligram per liter. Major cations are calcium, magnesium, sodium, and potassium; the major anions are sulfate, chloride, fluoride, nitrate, and those contributing to alkalinity (see alkaline, most generally assumed to be bicarbonate and carbonate).

**Marine wetland** – Wetlands that are exposed to waves and currents of the open ocean and to water having a salinity greater than 30 parts per thousand; present along the coastlines of the open ocean.

**Marsh** – A water-saturated, poorly drained area, intermittently or permanently water covered, having aquatic and grasslike vegetation.

**Maturity** – A stage in the evolutionary erosion of land areas in which the flat uplands have been widely dissected by deep river valleys.

**Maturity (stream)** – The stage in the development of a stream at which it has reached its maximum efficiency, when velocity is just sufficient to carry the sediment delivered to it by tributaries; characterized by a broad, open, flat-floored valley having a moderate gradient and gentle slope.

**Maximum contaminant level (MCL)** – Maximum permissible level of a contaminant in water that is delivered to any user of a public water system. MCLs are enforceable standards established by the U.S. Environmental Protection Agency.

**Mean** – The arithmetical average of a set of observations, unless otherwise specified.

**Mean discharge (MEAN)** – The arithmetical mean of individual daily mean discharges of a stream during a specific period, usually daily, monthly, or annually.

**Mean low tide** – The average altitude of all low tides recorded at a given place over a 19-year period.

**Mean high tide** – The average altitude of all high tides recorded at a given place over a 19-year period.

**Media/medium** – Specific environments that can contain contaminants. Air, water, sediment and soil are media.

**Median** – The middle or central value in a distribution of data ranked in order of magnitude. The median is also known as the 50th percentile.

**Mesophyte** – Any plant growing where moisture and aeration conditions lie between the extremes of “wet” and “dry.”

**Metabolite** – A substance produced in or by biological processes.

**Metals** – A number of chemical elements that share certain special characteristics. Many metals can be toxic in high doses and can bioaccumulate in the food chain. Metals sometimes found at hazardous waste sites include: arsenic, barium, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc.

**Metamorphic rocks** – Rocks derived from pre-existing rocks by mineralogical, chemical, or structural changes (essentially in a solid state) in response to marked changes in temperature, pressure, shearing stress, and chemical environment at depth in the Earth's crust.

**Methane** – An odorless gas produced in newer landfills as organic material (previously living things or material derived from living things) breaks down. Methane production drops off as a landfill gets older.

**Method detection limit** – The minimum concentration of a substance that can be accurately identified and measured with current laboratory technologies.

**Methylene chloride** – A colorless nonflammable liquid, with a pleasant aromatic odor, used as a solvent, paint remover, and degreaser.

**Micrograms per kilogram ( $\mu\text{g}/\text{kg}$ )** – A way of expressing dose: micrograms ( $\mu\text{g}$ ) of a substance per kilogram (kg) of body weight or soil.

**Micrograms per liter ( $\mu\text{g}/\text{l}$ )** – A unit of measure: the number of micrograms of one substance in a liter of liquid. One microgram per liter means one microgram of chemical per liter of water, and is essentially equivalent to one part per billion (ppb). Theoretically one  $\mu\text{g}/\text{l}$  of a substance equals one part per billion of the substance multiplied by its density.

**Midge** – A small fly in the family Chironomidae. The larval (juvenile) life stages are aquatic.

**Milligram (mg)** – A mass equal to 10<sup>-3</sup> grams.

**Milligrams per kilogram (mg/kg)** – A way of expressing dose: milligrams (mg) of a substance per kilogram (kg) of body weight or soil.

**Milligrams per liter (mg/l)** – A unit expressing the concentration of chemical constituents in solution as weight (milligrams) of solute per unit volume (liter) of water; equivalent to one part per million in most streamwater and groundwater.

**Mineral soil** – Soil composed predominantly of mineral rather than organic materials; less than 20 percent organic material.

**Minimum reporting level (MRL)** – The smallest measured concentration of a constituent that may be reliably reported using a given analytical method. In many cases, the MRL is used when documentation for the method detection limit is not available.

**Mitigation** – Actions taken to avoid, reduce, or compensate for the effects of human-induced environmental damage.

**Monitoring** – Repeated observation, measurement, or sampling at a site, on a scheduled or event basis, for a particular purpose.

**Monitoring well – 1)** A well used to obtain water quality samples or measure groundwater levels. **2)** A well drilled to collect groundwater samples for testing to determine the amounts, types, and distribution of contaminants in the groundwater beneath the site. The well enables samples of groundwater to be collected at a specific horizontal and vertical location for chemical analysis. Sometimes soil samples are also collected as the well is being drilled.

**Monocyclic aromatic hydrocarbons** – Single-ring aromatic compounds. Constituents of lead-free gasoline; also used in the manufacture of monomers and plasticizers in polymers.

**Montane** – Of, pertaining to, or inhabiting cool upland slopes below the timberline; characterized by the dominance of evergreen trees.

**Moraine** – A mound, ridge, or other distinct accumulation of unsorted, unstratified glacial drift predominantly till, deposited chiefly by direct action of glacier ice.

**Mouth** – The place where a stream discharges to a larger stream, a lake, or the sea.

**Muck** – Dark, finely divided, well-decomposed, organic matter forming a surface deposit in some poorly drained areas.

**Muskeg** – Large expanses of peatlands or bogs in subarctic zones.

**N**

**National Academy of Sciences/National Academy of Engineering (NAS/NAE) recommended maximum concentration in water**

Numerical guidelines recommended by two joint NAS/NAE committees for the protection of freshwater and marine aquatic life, respectively. These guidelines were based on results of aquatic toxicity studies, available in 1972, and were considered preliminary even at the time.

**National Geodetic Vertical Datum of 1929**

Geodetic datum derived from a general adjustment of first-order level nets of the United States and Canada; formerly called "Sea Level Datum of 1929."

**National Water-Quality Assessment (NAWQA) Program**

The long-term USGS program, begun in 1991, to assess the occurrence and distribution of water-quality conditions nationwide.

**Natural attenuation** – Relying on natural (physical, chemical, or biological) processes to reduce mass, toxicity, mobility, volume or concentration of compounds in earth or groundwater. Under proper conditions, can be used for perchloroethylene (PCE), trichloroethylene (TCE), and trichloroethane (TCA) at a lower cost than conventional remediation technologies.

**Natural levee** – A long, broad, low ridge built by a stream on its flood plain along one or both banks of its channel in time of flood.

**Navigable water** – In the context of the Clean Water Act, all surface water.

**Nitrate** – An ion consisting of nitrogen and oxygen (NO). Nitrate is a plant nutrient and is very mobile in soils.

**Non-aqueous phase liquids (NAPL)**

Liquids, commonly a mixture of several different chemicals, that are either denser or less dense than water. Dense NAPL (DNAPL), such as chlorinated solvents, will sink if it enters groundwater; less dense, or light NAPL (LNAPL), such as gasoline, will float on the water table. NAPL in the subsurface can be a persistent source of groundwater contamination due to its low solubility and viscosity.

**Noncontact water recreation**

Recreational activities, such as fishing or boating, that do not include direct contact with the water.

**Nonpersistent emergent plants**

Emergent plants whose leaves and stems break down at the end of the growing season from decay or by the physical forces of waves and ice; at certain seasons, there are no visible traces of the plants above the surface of the water.

**Nonpoint source** – A source (of any water-carried material) from a broad area, rather than from discrete points.

**Nonpoint-source contaminant** – A substance that pollutes or degrades water that comes from lawn or cropland runoff, the atmosphere, roadways, and other diffuse sources.

**Nonpoint-source water pollution** – Water contamination that originates from a broad area (such as leaching of agricultural chemicals from crop land) and enters the water resource diffusely over a large area.

**Nonselective herbicide** – Kills or significantly retards growth of most higher plant species.

**Nuisance species** – Undesirable plants and animals, commonly exotic species.

**Nutrient** – Any inorganic or organic compound needed to sustain plant life.

**O**

**Occupational exposure limits** – Maximum allowable concentrations of toxic substances in workroom air for workers.

**Occurrence and distribution assessment**

– A component of the USGS National Water Quality Assessment (NAWQA) Program that entails characterization of broad-scale spatial and temporal distributions of water-quality conditions in relation to major contaminant sources and background conditions for surface water and groundwater.

**Odor threshold** – The lowest concentrations of a substance's vapor, in air, that can be smelled. Odor thresholds are highly variable, depending on the individual who breathes the substance and the nature of the substance.

**Offstream use** – Water withdrawn or diverted from a ground- or surface-water source for use. *See also* Withdrawal

**Operable unit** – An administrative term used to identify a portion of a site that can be addressed by a distinct investigation and/or cleanup approach. For example, groundwater contamination at a site may be considered as one operable unit, and soil contamination at the same site may be dealt with as a second operable unit. An operable unit can receive specific investigation, and a particular remedy may be proposed. A Record of Decision is prepared for each operable unit.

**Operation and Maintenance (O&M)** – The period following construction of a remedy during which elements of the remedy must be operated and maintained. For example, after a groundwater collection and treatment system is installed (the remedial con-

struction phase), operation of the groundwater collection system and treatment of the water would be part of the "Operation and Maintenance" phase of the remedial program. Activities could also include site inspections, groundwater well monitoring and other sampling.

**Order on Consent** – *See* Consent Order

**Organic – 1)** In chemistry, any compound containing carbon. **2)** Referring to or derived from living organisms.

**Organic compounds** – Chemicals that contain carbon.

**Organic detritus** – Any loose organic material in streams – such as leaves, bark, or twigs – removed and transported by mechanical means, such as disintegration or abrasion.

**Organic soil** – Soil that contains more than 20 percent organic matter in the upper 16 inches.

**Organochlorine compound** – Synthetic organic compounds containing chlorine. As generally used, term refers to compounds containing mostly or exclusively carbon, hydrogen, and chlorine. Examples include organochlorine insecticides, polychlorinated biphenyls, and some solvents containing chlorine.

**Organochlorine insecticide** – A class of organic insecticides containing a high percentage of chlorine. Includes dichlorodiphenylethanes (such as DDT), chlorinated cyclodienes (such as chlordane), and chlorinated benzenes (such as lindane). Most organochlorine insecticides were banned from use in the United States because of their carcinogenicity, tendency to bioaccumulate, and toxicity to wildlife.

**Organochlorine pesticide** – *See* Organochlorine insecticide.

**Organonitrogen herbicides** – A group of herbicides consisting of a nitrogen ring with associated functional groups and including such classes as triazines and acetanilides. Examples include atrazine, cyanazine, alachlor, and metolachlor.

**Organophosphate insecticides** – A class of insecticides derived from phosphoric acid. They tend to have high acute toxicity to vertebrates. Although readily metabolized by vertebrates, some metabolic products are more toxic than the parent compound.

**Organophosphorus insecticides** – Insecticides derived from phosphoric acid and generally the most toxic of all pesticides to vertebrate animals.

**Orographic** – Pertaining to mountains, in regard to their location and distribution;

said of the precipitation caused by the lifting of moisture-laden air over mountains.

**Outwash** – Soil material washed down a hillside by rainwater and deposited upon more gently sloping land.

**Overburden** – The rock and soil in the ground above bedrock.

**Overland flow** – The flow of rainwater or snowmelt over the land surface toward stream channels.

**Oxbow** – A bow-shaped lake formed in an abandoned meander of a river.

**Oxidizer – 1)** A substance (compound) that will accept electrons from another compound, thus changing (oxidizing) the other compound. **2)** A material which may cause combustible materials to ignite without the aid of an external ignition source (such as flame) or which, when mixed with combustible materials, increases the rate of burning of these materials.

## P

**Paleohydrology** – Study of hydrologic processes and events, using geological, botanical, and cultural evidence, that occurred before the beginning of the systematic collection of hydrologic data and observations.

**Palustrine wetlands** – Freshwater wetlands including open water bodies of less than 20 acres in which water is less than 2 meters deep; includes marshes, wet meadows, fens, playas, potholes, pocosins, bogs, swamps, and shallow ponds; most wetlands are in the Palustrine system.

**Particulates** – Fine liquid or solid particles such as dust, smoke mist, fumes, or smog, found in air or emissions.

**Parts per billion (ppb)** – The concentration of a substance of air, water or soil. One ppb means that there is one part of a substance for every billion parts of the air, water or soil in which it is measured. One ppb is about one drop of dye in 18,000 gallons of water or about one second in 32 years. One ppb is 1,000 times less than one part per million.

**Part per million (ppm)** – The concentration of a substance in air, water or soil. One ppm means that there is one part of a substance for every million parts of the water or soil in which it is measured. One ppm is about one drop of dye in 18 gallons of water, about one inch in 16 miles, or one penny in \$10,000.

**Parts per trillion (ppt)** – The concentration of a substance in air, water or soil. One ppt means that there is one part of a substance for every trillion parts of the water or soil in

which it is measured. One ppt is 1,000 times less than one part per billion.

**Pathogen** – Any living organism that causes disease.

**PCBs (polychlorinated biphenyls)** – A group of toxic, persistent chemicals used in transformers for insulating purposes, in gas pipeline systems as a lubricant, and in some fluorescent light ballasts. The sale of PCBs was banned by law in 1979, but many old transformers still contain them.

**Peak stage** – Maximum height of a water surface above an established datum plane. Same as peak gage height.

**Peat** – A highly organic soil, composed of partially decomposed vegetable matter.

**Perched groundwater** – Unconfined groundwater separated from an underlying main body of groundwater by an unsaturated zone.

**Perchloroethene** – See *Tetrachloroethene*

**Percolation** – The movement, under hydrostatic pressure, of water through interstices of a rock or soil (except the movement through large openings such as caves).

**Perennial stream** – A stream that normally has water in its channel at all times.

**Periphyton** – Micro-organisms that coat rocks, plants, and other surfaces on lake bottoms.

**Permafrost** – Any frozen soil, subsoil, surficial deposit or bedrock in arctic or subarctic regions where below-freezing temperatures have existed continuously from two to tens of thousands of years.

**Permeable/permeability** – The rate at which liquids pass through soil or other materials in a specified direction. Water moves easily through a “high permeability” soil (such as gravel) and very slowly through a “low permeability” soil (such as clay).

**Pesticide** – Substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any pest. Some pesticides can accumulate in the food chain and/or contaminate the environment if misused.

**pH** – A measure of the acidity (less than 7) or alkalinity (greater than 7) of a solution; a pH of 7 is considered neutral.

**Phenols** – A class of organic compounds containing phenol (C<sub>6</sub>H<sub>5</sub>OH) and its derivatives. Used to make resins, weed killers, and as a solvent, disinfectant, and chemical intermediate. Some phenols occur naturally in the environment.

**Phosphorus** – A nutrient essential for growth that can play a key role in stimulating aquatic growth in lakes and streams.

**Photo ionization detector (PID)** – A hand-held instrument used to measure the overall level of volatile organic compounds in air.

**Photosynthesis** – The synthesis of compounds with the aid of light.

**Phthalates** – A class of organic compounds containing phthalic acid esters [C<sub>6</sub>H<sub>4</sub>(COOR)<sub>2</sub>] and derivatives. Used as plasticizers in plastics. Also used in many other products (such as detergents, cosmetics) and industrial processes (such as defoaming agents in paper and paperboard manufacture, and dielectrics in capacitors).

**Physiographic province** – A region in which the landforms are distinctive and differ significantly from those of adjacent regions.

**Physiography** – A description of the surface features of the Earth, with an emphasis on the origin of landforms.

**Phytoplankton** – See *Plankton*.

**Picocurie (pCi)** – One trillionth (10<sup>-12</sup>) of the amount of radioactivity represented by a curie (Ci). A curie is the amount of radioactivity that yields 3.7 x 10<sup>10</sup> radioactive disintegrations per second (dps). A picocurie yields 2.22 disintegrations per minute (dpm) or 0.037 dps.

**Piezometer** – An instrument used to measure the elevation of the water table, i.e. how far below the surface groundwater is located.

**Pioneer plant** – Herbaceous annual and perennial seedling plants that colonize bare areas as a first stage in secondary succession.

**Piping** – Erosion by percolating water in a layer of subsoil, resulting in caving and in the formation of narrow conduits, tunnels, or “pipes” through which soluble or granular soil material is removed.

**Placer** – A surficial mineral deposit formed by mechanical concentration of mineral particles from weathered debris.

**Plankton** – Floating or weakly swimming organisms at the mercy of the waves and currents. Animals of the group are called zooplankton and the plants are called phytoplankton.

**Playa** – A dry, flat area at the lowest part of an undrained desert basin in which water accumulates and is quickly evaporated; underlain by stratified clay, silt, or sand and commonly by soluble salts; term used in Southwestern United States.

**Playa lake** – A shallow, temporary lake in an arid and or semiarid region, covering or occupying a playa in the wet season but drying up in summer; temporary lake that upon evaporation leaves or forms a playa.

**Plume** – An area of chemicals moving away from its source in a feather-like (hence the name, plume) shape. A plume, for example, can be a column of smoke drifting away from a chimney. An area of dissolved chemicals moving with groundwater is called a “groundwater contaminant plume.”

**Pocosin** – A local term along the Atlantic coastal plain, from Virginia south, for a shrub-scrub wetland located on a relatively flat terrain, commonly between streams.

**Point source** – Originating at any discrete source.

**Point-source contaminant** – Any substance that degrades water quality and originates from discrete locations such as discharge pipes, drainage ditches, wells, concentrated livestock operations, or floating craft.

**Pollutant** – Any substance that, when present in a hydrologic system at sufficient concentration, degrades water quality in ways that are or could become harmful to human and/or ecological health or that impair the use of water for recreation, agriculture, industry, commerce, or domestic purposes.

**Polychlorinated biphenyls (PCBs)** – A mixture of chlorinated derivatives of biphenyl, marketed under the trade name Aroclor with a number designating the chlorine content (such as Aroclor 1260). PCBs were used in transformers and capacitors for insulating purposes and in gas pipeline systems as a lubricant. Further sale for new use was banned by law in 1979.

**Polycyclic aromatic hydrocarbons (PAHs)** – A group of over 100 different chemicals that form during the incomplete burning of coal, oil and gas, garbage, or other organic substances like tobacco or charbroiled meat. PAHs are usually found as a mixture containing two or more of these compounds, such as soot. Some PAHs are manufactured. PAHs are found in coal tar, crude oil, creosote, and roofing tar, but a few are used in medicines or to make dyes, plastics, and pesticides. Most do not dissolve easily in water and stick tightly to soil particles.

**Polynuclear aromatic hydrocarbons (PAHs)** – See Polycyclic aromatic hydrocarbons

**Pool** – A small part of a stream reach with little velocity, commonly with water deeper than surrounding areas.

**Population** – A collection of individuals of one species or mixed species making up the residents of a prescribed area.

**Porosity** – The percentage of the total volume of a given body of rock that is pore

space. It is the portion of void (air) space in rock, soil, or sediment.

**Postemergence herbicide** – Herbicide applied to foliage after the crop has sprouted to kill or significantly retard the growth of weeds.

**Potable water** – Water that is safe and palatable for human consumption.

**Potential evapotranspiration** – The amount of moisture which, if available, would be removed from a given land area by evapotranspiration; expressed in units of water depth.

**Potentially responsible party (PRP)** – Persons identified by the EPA under CERCLA as being responsible for the contamination at a hazardous waste site. By law, PRPs may be generators, present or former owners or operators of a site, or transporters of the hazardous substances.

**Potentiometric surface** – An imaginary surface that represents the total head in an aquifer. It represents the height above a datum plane, at which the water level stands in tightly cased wells that penetrate the aquifer.

**Prairie pothole** – A shallow depression, generally containing wetlands, occurring in an outwash plain, a recessional moraine, or a till plain; usually the result of melted blocks of covered glacial ice; occur most commonly in the North-Central United States and in States west of the Great Lakes from Wisconsin to eastern Montana.

**PRAP** – See Proposed remedial action plan

**Precipitation** – 1) Rain or snow. 2) Removal of solids from liquid waste so that the hazardous solid portion can be disposed of safely.

**Preemergence herbicide** – Herbicide applied to bare ground after planting the crop but prior to the crop sprouting above ground to kill or significantly retard the growth of weed seedlings.

**Preliminary site assessment (PSA)** – A PSA is the Division of Environmental Remediation’s first investigation of a site.

**Presumptive remedy** – Cleanup technique(s) that can be applied to hazardous waste sites with common characteristics. For example, old municipal landfills built without a liner often have similar characteristics. EPA has developed a “presumptive remedy” for this type of site. Essentially, EPA said “Here’s a site similar in all key ways to many other sites we’ve cleaned up. couldn’t it make sense to use that cleanup approach here too?”

**Pristine** – The earliest condition of the quality of a water body; unaffected by

human activities.

**Project manager** – A DEC staff member within the Division of Environmental Remediation (usually an engineer, geologist, or hydrogeologist) responsible for the remedial program at a hazardous waste site. The project manager works with the Division of Public Affairs and Education, fiscal and legal staff and the Department of Health to accomplish site-related goals and objectives.

**Proposed Remedial Action Plan (PRAP)** – A document outlining alternatives considered by the Division of Environmental Remediation for the remediation of a hazardous waste site and highlighting the alternative preferred by DEC. The PRAP is based on information developed during the site’s Remedial Investigation and Feasibility Study. The PRAP is reviewed by the public and other state agencies.

**Public hearing** – A formal hearing at which the public has the opportunity to submit comments and testimony on proposed actions for the public record.

**Public meeting** – A scheduled gathering of DEC staff and the public to give and receive information, ask questions and discuss concerns.

**Publicly owned treatment works (POTW)** – A wastewater system, owned by a municipality, state, or tribe that is used for the collection, treatment, and/or disposal of sewage. Usually POTW refers specifically to the sewage treatment plant.

**Public-supply withdrawals** – Water withdrawn by public and private water suppliers for use within a general community. Water is used for a variety of purposes such as domestic, commercial, industrial, and public water use.

**Pump and treat** – A method used to collect and treat contaminated groundwater. Typically, groundwater is collected in a well or trench and pumped to a treatment system.

## Q

**Quality assurance (QA)/ quality control (QC)** – A system of procedures, checks, audits, and corrective actions to ensure that environmental sampling and testing are of the highest achievable quality.

## R

**Radon** – A naturally occurring, colorless, odorless, radioactive gas formed by the disintegration of the element radium; damaging to human lungs when inhaled.

**Rain shadow** – A dry region on the lee side of a topographic obstacle, usually a mountain range, where rainfall is noticeably less than on the windward side.

**Reach** – A continuous part of a stream between two specified points.

**Reactivity** – The ability of a substance to undergo change, usually by combining with another substance or by breaking down. Certain conditions, such as heat and light, may cause a substance to become more reactive. Highly reactive substances may explode.

**Reaeration** – The replenishment of oxygen in water from which oxygen has been removed.

**Real-time data** – Data collected by automated instrumentation and telemetered and analyzed quickly enough to influence a decision that affects the monitored system.

**Realtime monitoring** – During construction or investigation activities, continuous monitoring of air with equipment that gives immediate readouts; that is, samples

**Recessional moraine** – An end moraine built during a temporary but significant pause in the final retreat of a glacier.

**Recharge (groundwater)** – The process involved in the absorption and addition of water to the zone of saturation; also, the amount of water added.

**Recharge area (groundwater)** – An area within which water infiltrates the ground and reaches the zone of saturation.

**Reclassification** – A process by which the Division of Environmental Remediation redefines the threat posed by a hazardous waste site to public health and the environment by developing and assessing site information and, based on findings and conclusions, assigning the site a new classification code. *See* Site classification.

**Record of Decision (ROD)** – A document which provides the definitive record of the cleanup alternative that will be used to remediate a hazardous waste site. The ROD is based on the Remedial Investigation/Feasibility Study and public comment.

**Recurrence interval** – The average interval of time within which the magnitude of a given event such as a storm or flood, will be equaled or exceeded once.

**Reference site** – A NAWQA sampling site selected for its relatively undisturbed conditions.

**Regolith** – The layer or mantle of fragmented and unconsolidated rock material, residual or transported, that nearly everywhere

forms the surface of the land and overlies or covers the bedrock.

**Regulation (of a stream)** – Artificial manipulation of the flow of a stream.

**Relative abundance** – The number of organisms of a particular kind present in a sample relative to the total number of organisms in the sample.

**Remedial/remediate/remediation** – Refers to any procedures or strategies used to address a hazardous waste site. For example, a Remedial Investigation determines what areas of a site need to be addressed (cleaned up or remediated), a proposed remedial action plan describes remedial actions (cleanup methods or corrective actions) that have been recommended for a specific site; remediation of a site could include removing contaminated soil.

**Remedial action (RA)** – Action taken to remove, destroy, reduce, or prevent the spread of contamination at a hazardous waste site.

**Remedial construction (RC)** – The physical development, assembly and implementation of the alternative selected to remediate a site. For example, remedial construction could include installing a groundwater collection and treatment system. Construction follows a remedial design stage.

**Remedial design (RD)** – The process following finalization of a Record of Decision in which plans and specifications are developed for the implementation of the alternative selected to remediate (clean up) a site.

**Remedial Investigation (RI)** – Studies designed to gather the data necessary to determine the type (nature) and extent (location) of contamination at a hazardous waste site. The RI is usually performed at the same time as a Feasibility Study in a process known as the "RI/FS." This process is designed to:

- Establish criteria for cleaning up the site.
- Identify and screen cleanup alternatives for remedial action; and
- Analyze in detail the technology and costs of the alternatives.

**Remedial program** – DEC's efforts to investigate and clean up inactive hazardous waste disposal sites. A remedial program is designed to correct or cure (remedy) releases or potential releases of hazardous materials into the environment. DEC takes several steps as part of each site's remedial program: it investigates contamination (Remedial Investigation), analyzes different methods to address threats posed by the site (Feasibility Study), proposes a cleanup plan (Proposed Remedial Action Plan),

selects a final plan (Record of Decision), and designs and implements the plan (Remedial Design and Remedial Construction).

**Remediation** – *See* Remedial

**Remedy** – Actions taken to prevent or mitigate the release of hazardous materials into the environment at hazardous waste sites and Brownfield sites. The word "remedy" is used in the sense of a "cure" or "corrective action."

**Removal action** – Often less burdensome and extensive than remedial actions, a removal action is intended to be a quick, temporary response to a release or the threat of release of a hazardous material at a hazardous waste site. A removal action could involve removing drums of hazardous material, contaminated soil or contaminated sediment and taking these items to a proper disposal facility.

**Residential water use** – *See* Domestic withdrawals.

**Residual/residue** – The quantity of a substance, its degradation products, and/or its metabolites remaining on or in the soil or groundwater. "Residual contamination" usually refers to low levels of chemicals that may be left in soil, bedrock or groundwater after cleanup of hazardous wastes.

**Resource Conservation and Recovery Act (RCRA)** – Federal law governing the treatment, storage, handling, disposal, and overall management of solid and hazardous wastes.

**Responsible parties** – *See* Potentially responsible parties

**Responsiveness summary** – A formal or informal written summary and response by the DEC to public questions and comments. A responsiveness summary is prepared following a public meeting about a Proposed Remedial Action Plan and may also be prepared after other public meetings. The responsiveness summary may list and respond to each question, or summarize and respond to questions in categories.

**Retrospective analysis** – Review and analysis of existing data in order to address NAWQA objectives, to the extent possible, and to aid in the design of NAWQA studies.

**Return flow** – That part of irrigation water that is not consumed by evapotranspiration and that returns to its source or another body of water.

**Reverse osmosis** – A type of pressurized filtration system in which water is forced through a semipermeable membrane that allows the passage of water but restricts many contaminants.

**Riffle** – A shallow part of the stream where water flows swiftly over completely or partially submerged obstructions to produce surface agitation.

**Riparian** – Pertaining to or situated on the bank of a natural body of flowing water.

**Riparian rights** – A concept of water law under which authorization to use water in a stream is based on ownership of the land adjacent to the stream. *See also* Water rights.

**Riparian zone** – Pertaining to or located on the bank of a body of water, especially a stream.

**Risk** – The chance of an injury, illness, or death caused by exposure to a hazard.

**Risk assessment** – The qualitative and quantitative evaluation performed in an effort to define the risk posed to human health and/or the environment by the presence or potential presence and/or use of specific pollutants.

**Riverine wetlands** – Wetlands within river and stream channels; ocean-derived salinity is less than 0.5 part per thousand.

**Rock** – Any naturally formed, consolidated or unconsolidated material (but not soil) consisting of two or more minerals.

**ROD** – *See* Record of decision

**Runoff** – That part of precipitation or snowmelt that appears in streams or surface-water bodies.

**Rural withdrawals** – Water used in suburban or farm areas for domestic and livestock needs. The water generally is self-supplied and includes domestic use, drinking water for livestock, and other uses such as dairy sanitation, evaporation from stock-watering ponds, and cleaning and waste disposal.

**S**

**Salina** – An area where deposits of crystalline salt are formed, such as a salt flat; a body of saline water, such as a saline playa or salt marsh.

**Saline water** – Water that is considered unsuitable for human consumption or for irrigation because of its high content of dissolved solids; generally expressed as milligrams per liter (mg/L) of dissolved solids; seawater is generally considered to contain more than 35,000 mg/L of dissolved solids. A general salinity scale is:

	Concentration of dissolved solids in milligrams per liter
Slightly Saline	1,000-3,000
Moderately Saline	3,000-10,000
Very Saline	10,000-35,000
Brine	More than 35,000

**Sampling** – Small amounts of air, water, or soil are obtained and tested to determine the levels of different hazardous chemicals contained in them.

**Sanitary landfill** – *See* Landfill

**Saturated zone** – A subsurface area in which all pores and cracks in rock and/or soil are with water.

**Scrubber** – A device for removing unwanted gases or particles from an air stream spraying the air with liquid (usually water) or forcing air through a series of baths. Scrubbers are often put on smoke stacks.

**Sea level** – Long-term average position of the sea surface. Sea level varies from place to place and with the time period for which the average is calculated. For the conterminous United States, sea level is most commonly referenced to the National Geodetic Vertical Datum of 1929.

**Sea water** – *See* Saline water

**Secondary maximum contaminant level (SMCL)** – The maximum level of a contaminant or undesirable constituent in public water systems that in the judgment of the U.S. Environmental Protection Agency (USEPA), is required to protect the public welfare. SMCLs are secondary (nonenforceable) drinking water regulations established by the USEPA for contaminants that may adversely affect the odor or appearance of such water.

**Sediment** – Particles, derived from rocks or biological materials, that have been transported by a fluid or other natural process, suspended or settled in water.

**Sediment guideline** – Threshold concentration above which there is a high probability of adverse effects on aquatic life from sediment contamination, determined using modified U.S. Environmental Protection Agency USEPA (1996) procedures.

**Sedimentary rocks** – Rocks formed by the consolidation of loose sediment that has accumulated in layers.

**Sedimentation** – The act or process of forming or accumulating sediment in layers; the process of deposition of sediment.

**Seep** – A small area where water percolates (see percolation) slowly to the land surface.

**Seiche** – A sudden oscillation of the water in a moderate-size body of water, caused by wind.

**Selected alternative – 1)** The cleanup alternative selected by the state as the most feasible. **2)** The cleanup alternative selected for a site on the National Priorities List based on technical feasibility, permanence, reliability, and cost.

**Selective herbicide** – A compound that kills or significantly retards growth of an unwanted plant species without significantly damaging desired plant species.

**Semipermeable membrane device (SPMD)** – A long strip of low-density, polyethylene tubing filled with a thin film of purified lipid such as triolein that simulates the exposure to and passive uptake of highly lipid-soluble organic compounds by biological membranes.

**Semivolatile organic compound (SVOC)** – Operationally defined as a group of synthetic organic compounds that are solvent-extractable and can be determined by gas chromatography/mass spectrometry. SVOCs include phenols, Phthalates, and Polycyclic aromatic hydrocarbons (PAHs).

**Shale** – A fine-grained sedimentary rock formed by the consolidation of clay, silt, or mud.

**Shallows** – A term applied to a shallow place or area in a body of water; a shoal.

**Shoal** – A relatively shallow place in a stream, lake, or sea.

**Short-wave trough (meteorological)** – A wave of low atmospheric pressure in the form of a trough that has a wave length of 600 to 1,500 miles and moves progressively through the lower troposphere in the same direction as that of the prevailing current of air motion.

**Shrubland** – Land covered predominantly with shrubs.

**Sideslope gradient** – The representative change in elevation in a given horizontal distance (usually about 300 yards) perpendicular to a stream; the valley slope along a line perpendicular to the stream (near a water-quality or biological sampling point).

**Siliciclastic rocks** – Rocks such as shale and sandstone that are formed by the compaction and cementation of quartz-rich mineral grains.

**Siltation** – The deposition or accumulation of silt (or small-grained material) in a body of water.

**Siltstone** – An indurated silt having the texture and composition of shale but lacking its fine lamination.

**Silviculture** – The cultivation of forest trees.

**Sinkhole** – A depression in an area underlain by limestone. Its drainage is subterranean.

**Sinuosity** – The ratio of the channel length between two points on a channel to the straight-line distance between the same two points; a measure of meandering.

**Site classification** – DEC assigns inactive hazardous waste disposal sites classifications established by state law, as follows:

**Class 1** – A site causing or presenting an imminent danger of causing irreversible or irreparable damage to the public health or environment – immediate action required.

**Class 2** – A site posing a significant threat to the public health or environment – action required.

**Class 2a** – A temporary classification for a site that has inadequate and/or insufficient data for inclusion in any of the other classes.

**Class 3** – Site does not present a significant threat to the public health or the environment – action may be deferred.

**Class 4** – A site which has been properly closed – requires continued management.

**Class 5** – A site which has been properly closed, with no evidence of present or potential adverse impact – no further action required.

**Skewness** – Numerical measure of the lack of symmetry of an asymmetrical frequency distribution.

**Sludge** – A semi-solid residue from any of a number of industrial processes or air or water treatment processes. Sludge can be a hazardous waste.

**Slough** – A small marshy tract lying in a swale or other local shallow, undrained depression; a sluggish creek or channel in a wetland.

**Slurry** – A watery mixture that does not contain a significant amount of dissolved materials.

**Slurry Wall** – An underground wall designed to stop groundwater flow; constructed by digging a trench and backfilling it with a slurry rich in bentonite clay.

**Soil** – The layer of material at the land surface that supports plant growth.

**Soil boring** – A circular hole made in the ground by an auger or mechanical drill rig to collect soil samples deep in the ground. Representative samples are collected for testing to see if the subsoil has been contaminated. Sometimes these borings are converted into groundwater monitoring wells.

**Soil gas** – Air in the spaces between soil particles. Contaminants can be trapped in this air.

**Soil gas survey** – A method for investigating underground distributions of volatile organic compounds (VOCs) by looking for their vapors in the shallow soil gas. The presence of VOCs in shallow soil gas indicates the VOCs may be in the unsaturated (dry) soil or in the groundwater below the probe. This survey is used to trace the outline of a contaminant plume and help determine the best location to install groundwater monitoring wells.

**Soil horizon** – A layer of soil that is distinguishable from adjacent layers by characteristic physical and chemical properties.

**Soil moisture** – Water occurring in the pore spaces between the soil particles in the unsaturated zone from which water is discharged by the transpiration of plants or by evaporation from the soil.

**Soil Vapor Extraction System (SVE)** – An in-situ remediation technique that applies a vacuum to a series of wells (“vapor extraction wells”) and induces air flow through contaminated soil. As the air migrates through the soil, volatile organic compounds (VOCs) volatilize (evaporate) and move with the air to the extraction wells where they are removed from the subsurface. If the concentration of VOCs in the extracted air is high, the air may be treated by a carbon adsorption system before being released to the atmosphere. In some cases, dual phase vacuum extraction is used to treat both groundwater and the overlying soil.

**Sole-source aquifer** – As defined by the U.S. Environmental Protection Agency, an aquifer that supplies 50 percent or more of the drinking water of an area.

**Solid-phase extraction** – A procedure to isolate specific organic compounds onto a bonded silica extraction column.

**Solid waste** – Non-liquid, nonsoluble materials ranging from municipal garbage to industrial wastes that contain complex, and sometimes hazardous, substances. Solid wastes also include sewage sludge, agricultural refuse, demolition wastes, and mining residues.

**Solute** – See Solution

**Solubility** – The amount of a substance that can be dissolved in water or (sometimes) another substance.

**Solution** – Formed when a solid, gas, or another liquid in contact with a liquid becomes dispersed homogeneously throughout the liquid. The substance, called a solute, is said to dissolve. The liquid is called the solvent.

**Solvent** – A substance (usually a liquid) capable of dissolving one or more other substances. For example, paint remover is a paint solvent.

**Sorb** – To take up and hold either by absorption or adsorption.

**Sorption** – General term for the interaction (binding or association) of a solute ion or molecule with a solid.

**Source area** – An area from which groundwater contamination is believed to originate. For example, Company A spilled a 55 gallon drum of trichloroethene (TCE) onto the ground near a loading dock at their facility. The TCE spread through the soil and contaminated groundwater around the facility. Because the contamination originated in the loading dock area, this area is the “source area.” Over time, the highly concentrated TCE in the source area would continue to slowly spread through groundwater and soil, acting as a continuous “source” of groundwater contamination. Thus, the most effective way to slow down and prevent further spreading of contamination would be to address the source area.

**Source rocks** – The rocks from which fragments and other detached pieces have been derived to form a different rock.

**Species** – Populations of organisms that may interbreed and produce fertile offspring having similar structure, habits, and functions.

**Species diversity** – An ecological concept that incorporates both the number of species in a particular sampling area and the evenness with which individuals are distributed among the various species.

**Species (taxa) richness** – The number of species (taxa) present in a defined area or sampling unit.

**Specific capacity** – The yield of a well per unit of drawdown.

**Specific conductance** – A measure of the ability of a liquid to conduct an electrical current.

**Specific yield** – The ratio of the volume of water that will drain under the influence of gravity to the volume of saturated rock.

**Spit** – A small point or low tongue or narrow embankment of land having one end attached to the mainland and the other terminating in open water.

**Split sample** – A sample prepared by dividing it into two or more equal volumes, so that each volume is considered a separate sample but representative of the entire sample.

**Split-spoon Sample** – A sample of unconsolidated material taken by driving a sampling device (split spoon) into the soil ahead of a drill bit in a soil boring. A split spoon sampler is typically driven into the soil by repeatedly dropping a weight.

**Spoil** – Overburden or other waste material removed in mining, quarrying, dredging, or excavating.

**Spring** – Place where a concentrated discharge of groundwater flows at the ground surface.

**Stage** – Height of the water surface above an established datum plane, such as in a river above a predetermined point that may (or may not) be at the channel floor.

**Standards, criteria and guidance values (SCGs)** – Values that indicate acceptable or normal levels of various contaminants in the environment. These values are used to establish cleanup goals at hazardous waste sites. Depending on the chemical, the values are developed by the U.S. Environmental Protection Agency, DEC.

**Standard deviation** – Statistical measure of the dispersion or scatter of a series of values. It is the square root of the variance, which is calculated as the sum of the squares of the deviations from the arithmetic mean, divided by the number of values in the series minus 1.

**State assistance contract (SAC)** – In DEC's Brownfield program, the official agreement between a municipality and the state that outlines both party's responsibility for a Brownfield investigation and/or cleanup.

**State climate division** – Geographic area in a State based primarily on crop-reporting districts. States can have 2 to 10 climate divisions.

**Statistics** – A branch of mathematics dealing with the collection, analysis, interpretation, and presentation of masses of numerical data.

**Storm surge** – An abnormal and sudden rise of the sea along a shore as a result of the winds of a storm.

**Stratification** – Subdivision of the environmental framework. NAWQA Study Units are divided into subareas that exhibit reasonably homogeneous environmental conditions, as determined by both natural and human influences.

**Stream-aquifer interactions** – Relations of water flow and chemistry between streams and aquifers that are hydraulically connected.

**Stream mile** – A distance of 1 mile along a line connecting the midpoints of the channel of a stream.

**Stream order** – A ranking of the relative sizes of streams within a watershed based on the nature of their tributaries. The smallest unbranched tributary is called first order, the stream receiving the tributary is called second order, and so on.

**Stream reach** – A continuous part of a stream between two specified points.

**Streamflow** – The discharge of water in a natural channel.

**Streamline** – A line on a map that is parallel to the direction of fluid flow and shows flow patterns.

**Study Unit** – A major hydrologic system of the United States in which NAWQA studies are focused. Study Units are geographically defined by a combination of ground- and surface-water features and generally encompass more than 4,000 square miles of land area.

**Study-Unit Survey** – Broad assessment of the water-quality conditions of the major aquifer systems of each NAWQA Study Unit. The Study-Unit Survey relies primarily on sampling existing wells and, wherever possible, on data collected by other agencies and programs. Typically, 20 to 30 wells are sampled in each of three to five aquifer subunits.

**Submersed plant** – A plant that lies entirely beneath the water surface, except for flowering parts in some species.

**Subsidence** – The gradual downward settling or sinking of the Earth's surface with little or no horizontal motion.

**Substrate** – The surface beneath a wetland, lake, or stream in which organisms grow or to which organisms are attached.

**Substrate size** – The diameter of streambed particles such as clay, silt, sand, gravel, cobble and boulders.

**Subsurface drain** – A shallow drain installed in an irrigated field to intercept the rising groundwater level and maintain the water table at an acceptable depth below the land surface.

**Subtidal** – Continuously submerged; an area affected by ocean tides.

**Subtropical anticyclone** – A semipermanent anticyclone located, on the average, over oceans near 30° N. and 30° S. latitude.

**Sump** – A pit or tank that catches liquid runoff for drainage or disposal.

**Superfund** – Federal and state programs to investigate and clean up inactive hazardous waste disposal sites. The federal program gives the U.S. Environmental Protection Agency the funding and authority to inves-

tigate, rank and conduct or supervise cleanup of sites on the National Priority List.

**Superfund Amendments and Reauthorization Act (SARA)** –

Modifications to CERCLA enacted in 1986. Sometimes referred to as the "Right to Know Law," it requires, among other things, that industry provide the government with information on the use and release of certain chemicals into the environment. This information is then made available to the public.

**Surface runoff** – Runoff that travels over the land surface to the nearest stream channel.

**Surface water** – All water naturally open to the atmosphere. Refers to water in rivers, lakes, reservoirs, streams, impoundments, seas, estuaries, and so on.

**Survey** – Sampling of a representative number of sites during a given hydrologic condition.

**Suspended** – (as used in tables of chemical analyses) The amount (concentration) of undissolved material in a water-sediment mixture. Most commonly refer to that material retained on a 0.45-micrometer filter.

**Suspended sediment** – Sediment that is transported in suspension by a stream.

**Suspended solids** – Different from suspended sediment only in the way that the sample is collected and analyzed.

**Suspended-sediment concentration** – The velocity-weighted concentration of suspended sediment in the sampled zone (from the water surface to a point approximately 0.3 foot above the bed); expressed as milligrams of dry sediment per liter of water-sediment mixture (mg/L).

**Swale** – A slight depression, sometimes swampy, in the midst of generally level land.

**Swamp** – An area intermittently or permanently covered with water, and having trees and shrubs.

**Synoptic sites** – Sites sampled during a short-term investigation of specific water-quality conditions during selected seasonal or hydrologic conditions, to provide improved spatial resolution for critical water-quality conditions.

**T**

**Tailings** – Rock that remains after processing ore to remove the valuable minerals.

**Tarn** – A relatively small and deep, steep-sided lake or pool occupying an ice-gouged basin amid glaciated mountains.

**Taxa richness** – See Species richness

**Taxon (plural taxa)** – Any identifiable group of taxonomically related organisms.

**Technical and Administrative Guidance Memorandum (TAGM)** – An official internal Division of Environmental Remediation document that outlines divisional policies or recommended guidance for topics such as determining cleanup goals at hazardous waste sites.

**Technical Assistance Grant Program (TAG Program)** – A federal grant program that provides funds for qualified citizens' groups to hire independent technical advisors to help them understand and comment on technical decisions relating to federal Superfund cleanup actions.

**Technical and Operational Guidance Series (TOGs)** – DEC Division of Water's documents listing water quality standards and guidance values.

**Tectonic activity** – Movement of the Earth's crust resulting in the formation of ocean basins, continents, plateaus, and mountain ranges.

**Terminal moraine** – The end moraine extending across a glacial plain or valley as an arcuate or crescent ridge that marks the farthest advance or maximum extent of a glacier.

**Terrane** – Area or surface over which a particular rock type or group of rock types is prevalent.

**Terrestrial** – Pertaining to, consisting of, or representing the Earth.

**Tertiary-treated sewage** – The third phase of treating sewage that removes nitrogen and phosphorus before it is discharged.

**Test pit** – A small excavation at a hazardous waste site. Investigators dig test pits to get an idea of subsurface conditions at hazardous waste sites.

**Tetrachloroethene (Perchloroethene)** – A clear, colorless, non-flammable liquid with a characteristic odor. It is a widely used solvent, especially as a dry cleaning agent and as a degreaser.

**Thermal loading** – Amount of waste heat discharged to a water body.

**Thermoelectric power** – Electrical power generated by use of fossil-fuel (coal, oil, or natural gas), geothermal, or nuclear energy.

**Thermokarst** – An irregular land surface formed in a permafrost region by melting ground ice and a subsequent settling of the ground.

**Threshold** – A dose or exposure below which there is no measurable adverse effect.

**Tidal flat** – An extensive, nearly horizontal, tract of land that is alternately covered and uncovered by the tide and consists of unconsolidated sediment.

**Tide** – The rhythmic, alternate rise and fall of the surface (or water level) of the ocean, and connected bodies of water, occurring twice a day over most of the Earth, resulting from the gravitational attraction of the moon, and to a lesser degree, the sun.

**Tier 1 sediment guideline** – Threshold concentration above which there is a high probability of adverse effects on aquatic life from sediment contamination, determined using modified U.S. Environmental Protection Agency USEPA (1996) procedures.

**Tile drain** – A buried perforated pipe designed to remove excess water from soils.

**Till** – Predominantly unsorted and unstratified drift, deposited directly by and underneath a glacier without subsequent reworking by meltwater, and consisting of a heterogeneous mixture of clay, silt, sand, gravel, and boulders.

**Tinaja** – A pocket of water developed below a waterfall; a term used in the Southwestern United States; used loosely to mean a temporary pool.

**Tissue study** – The assessment of concentrations and distributions of trace elements and certain organic contaminants in tissues of aquatic organisms.

**Tolerant species** – Those species that are adaptable to (tolerant of) human alterations to the environment and often increase in number when alterations occur.

**Topography** – The general configuration of a land surface or any part of the Earth's surface, including its relief and the position of its natural and man-made features.

**Total concentration** – Refers to the concentration of a constituent regardless of its form (dissolved or bound) in a sample.

**Total DDT** – The sum of DDT and its metabolites (breakdown products), including DDD and DDE.

**Total head** – The height above a datum plane of a column of water. In a groundwater system, it is composed of elevation head and pressure head.

**Toxicity** – The degree of danger posed by a substance to animal or plant life.

**Toxicity Characteristic Leaching Procedure** – Laboratory test used to determine the mobility of organic and inorganic contaminants present in liquid, solid, and multiphase wastes. If an extract from a representative sample is shown to contain any

contaminant in an amount exceeding the levels allowed by regulations, the waste is banned for land disposal unless properly treated.

**Toxic substances** – A chemical or mixture that may present an unreasonable risk of injury to health or the environment.

**Toxic Substances Control Act (TSCA) of 1976** – A federal law that provides for testing of manufactured substances to determine toxic or otherwise harmful characteristics and regulation of the manufacture, distribution, use, and disposal of regulated substances.

**Trace element** – A chemical element that is present in minute quantities in a substance.

**Tracer** – A stable, easily detected substance or a radioisotope added to a material to follow the location of the substance in the environment or to detect any physical or chemical changes that it undergoes.

**Trade winds** – A system of easterly winds that dominate most of the tropics. A major component of the general circulation of the atmosphere.

**Transmissivity** – The rate at which water of the prevailing kinematic viscosity is transmitted through a unit width of an aquifer under a unit hydraulic gradient. It equals the hydraulic conductivity multiplied by the aquifer thickness.

**Transpiration** – The process by which water passes through living organisms, primarily plants, into the atmosphere.

**Treatability studies** – **1)** Tests of potential cleanup technologies conducted in a laboratory. **2)** Pilotscale type tests conducted at hazardous wastes sites to determine if a treatment technology will work for that site's particular set of environmental conditions.

**Treatment, storage, and disposal facility (TSDF)** – A site where a hazardous substance is treated, stored or disposed of. TSDF facilities are regulated by EPA and states under the Resource Conservation and Recovery Act.

**Triazine herbicide** – A class of herbicides containing a symmetrical triazine ring (a nitrogen-heterocyclic ring composed of three nitrogens and three carbons in an alternating sequence). Examples include atrazine, propazine, and simazine.

**Triazine pesticide** – See Triazine herbicide

**Tributary** – A river or stream flowing into a larger river, stream or lake.

**1,1,1-Trichloroethane (1,1,1 TCA) –**

Colorless, non-flammable, man-made liquid solvent used as a degreaser, a dry cleaning agent, and a propellant.

**Trichloroethene or Trichloroethylene (TCE) –**

A colorless, man-made liquid used primarily as a solvent for removing grease from metal. It has a variety of other uses such as a dry cleaning solvent and in the production of other chemicals. It generally gets into drinking water by improper waste disposal.

**Tritium –** A radioactive form of hydrogen with atoms of three times the mass of ordinary hydrogen; can be used to determine the age of water.

**Tropical cyclone –** A cyclone that originates over the tropical oceans. Tropical cyclones are classified according to their intensity and windspeed and, when fully mature, are characterized by extremely high speed winds and torrential rains. In the United States, tropical cyclones that have windspeeds greater than 40 miles per hour are classified as tropical storms, and tropical cyclones that have windspeeds of 74 miles per hour or more are classified as hurricanes. *See also* Cyclone

**Troposphere –** Lowest 6 to 12 miles of the atmosphere, characterized by a general decrease in temperature with height, appreciable water content, and active weather processes.

**Trough (groundwater) –** An elongated depression in a potentiometric surface.

**Trough (meteorological) –** An elongated area of relatively low atmospheric pressure; the opposite of a ridge. This term commonly is used to distinguish a feature from the closed circulation of a low (or cyclone). A large trough, however, may include one or more lows, and an upper-air trough may be associated with a lower-level low.

**Tundra –** A vast, nearly level, treeless plain of the arctic and subarctic regions. It usually has a marshy surface which supports mosses, lichens, and low shrubs, underlain by mucky soils and permafrost.

**Turbidity –** The state, condition, or quality of opaqueness or reduced clarity of a fluid due to the presence of suspended matter.

**U**

**Unconfined aquifer –** An aquifer in which water is not contained by an impermeable layer of rock or soil. The water level in the aquifer may rise or fall according to the volume of water stored, which varies according to seasonal cycles of natural recharge.

**Unconsolidated deposit –** Deposit of loosely bound sediment that typically fills topographically low areas.

**Underground water –** Subsurface water in the unsaturated and saturated zones. *See also* Groundwater

**Understory –** A foliage layer lying beneath and shaded by the main canopy of a forest.

**Un-ionized –** The neutral form of an ionizable compound (such as an acid or a base).

**Un-ionized ammonia –** The neutral form of ammonia-nitrogen in water, usually occurring as NH<sub>4</sub>OH. Un-ionized ammonia is the principal form of ammonia that is toxic to aquatic life. The relative proportion of un-ionized to ionized ammonia (NH<sub>4</sub><sup>+</sup>) is controlled by water temperature and pH. At temperatures and pH values typical of most natural waters, the ionized form is dominant.

**Unsaturated zone –** The area of soil and rock between the land surface and the water table. The spaces between soil particles (pore spaces) in the unsaturated zone contain mostly air, but water occurs there as soil moisture.

**Upgradient –** Of or pertaining to the place(s) from which groundwater originated or traveled through before reaching a given point in an aquifer.

**Upland –** A general term for nonwetland; elevated land above low areas along streams or between hills; any elevated region from which rivers gather drainage.

**Uranium (U) –** A heavy silvery-white metallic element highly radioactive and easily oxidized. Of the 14 known isotopes of uranium, U<sub>238</sub> is the most abundant in nature.

**Urban site –** A site that has greater than 50 percent urbanized and less than 25 percent agricultural area.

**V**

**Vadose zone –** The underground zone between the land surface and the water table; essentially the unsaturated zone.

**Vapor –** The gas given off by a solid or liquid substance at ordinary temperatures.

**Vascular plant –** A plant composed of or provided with vessels or ducts that convey water or sap. A fern is an example of this type of plant.

**Vernal pool –** A small lake or pond that is filled with water for only a short time during the spring.

**Vinyl chloride –** A colorless gas used in the manufacture of polyvinyl chloride and other resins, and as a chemical intermediate and as an industrial solvent. Vinyl chloride is a

carcinogen.

**Viscosity –** The property of a fluid describing its resistance to flow.

**Volatile –** Description of any substance that evaporates easily.

**Volatile organic compounds (VOCs) –** Carbon-containing chemicals which readily evaporate (cleaning solvents, gasoline, etc.). Many common industrial chemicals are VOCs, including trichloroethene, 1,1,1-trichloroethane, and tetrachloroethene.

**Voluntary cleanup agreement –** A legal document signed by DEC and another party (volunteer) for investigation and/or cleanup of a contaminated site. In return for cleaning up the site, the volunteer receives a limited liability release for past environmental contamination of the site.

**Voluntary cleanup program –** A program designed to promote voluntary cleanup of contaminated sites including inactive hazardous waste sites, hazardous substance sites, petroleum contaminated sites and solid waste disposal sites, whereby the volunteer enters into a Voluntary Cleanup Agreement with the DEC.

**W**

**Waste – 1)** Unwanted materials left over from a manufacturing process. **2)** Refuse from places of human or animal habitation.

**Wasteway –** A waterway used to drain excess irrigation water dumped from the irrigation delivery system.

**Water-bearing zone –** The area underground in which pores and cracks in rock and/or soil are normally filled with water. Therefore, if a well is drilled into this area, water can be drawn out on a regular basis.

**Water budget –** An accounting of the inflow to, outflow from, and storage changes of water in a hydrologic unit.

**Water column –** An imaginary column extending through a water body from its floor to its surface.

**Water column studies –** Investigations of physical and chemical characteristics of surface water, which include suspended sediment dissolved solids, major ions, and metals, nutrients, organic carbon, and dissolved pesticides, in relation to hydrologic conditions, sources, and transport.

**Water content of snow –** Amount of liquid water in the snow at the time of observation. Water equivalent of snow.

**Water demand –** Water requirements for a particular purpose, such as irrigation, power, municipal supply, plant transpiration, or storage.

**Water exports** – Artificial transfer (by pipes or canals) of freshwater from one region or subregion to another.

**Water gap** – A deep, narrow pass in a mountain ridge through which a stream flows.

**Water imports** – Artificial transfer (by pipes or canals) of freshwater to one region or subregion from another.

**Water rights** – Legal rights to the use of water. *See also* Riparian rights.

**Water table** – The level of groundwater; the boundary between the unsaturated zone and the saturated zone. The watertable generally reflects surface topography and varies with changes in land surface elevations. **Weir 1)** A wall or plate in an open channel to measure the flow of water. **2)** A wall or obstruction used to control flow from settling tanks, clarifiers, or a drainage system to ensure a uniform flow rate.

**Water-quality criteria** – Specific levels of water quality which, if reached, are expected to render a body of water unsuitable for its designated use. Commonly refers to criteria established by the U.S. Environmental Protection Agency. Water-quality criteria are based on specific levels of pollutants that would make the water harmful if used for drinking, swimming, farming, fish production, or industrial processes.

**Water-quality guidelines** – Specific levels of water quality which, if reached, may adversely affect human health or aquatic life. These are nonenforceable guidelines issued by a governmental agency or other institution.

**Water-quality standards** – State-adopted and U.S. Environmental Protection Agency-approved ambient standards for water bodies. Standards include the use of the water body and the water-quality criteria that must be met to protect the designated use or uses.

**Watershed** – *See* Drainage basin

**Water year** – A continuous 12-month period selected to present data relative to hydrologic or meteorological phenomena during which a complete annual hydrologic cycle normally occurs. The water year used by the U.S. Geological Survey runs from October 1 through September 30, and is designated by the year in which it ends.

**Water-resources region** – Natural drainage basin or hydrologic area that contains either the drainage area of a major river or the combined areas of a series of rivers. In the United States, there are 21 regions of which 18 are in the conterminous United States,

and one each in Alaska, Hawaii, and the Caribbean.

**Water-resources subregion** – Subdivision of a water-resources region. The 21 water-resources regions of the United States are subdivided into 222 subregions. Each subregion includes that area drained by a river system, a reach of a river and its tributaries in that reach, a closed basin(s), or a group of streams forming a coastal drainage area.

**Weather** – State of the atmosphere at any particular time and place.

**Weathering** – Process whereby earthy or rocky materials are changed in color, texture, composition, or form (with little or no transportation) by exposure to atmospheric agents.

**Weighted mean** – A value obtained by multiplying each of a series of values by its assigned weight and dividing the sum of these products by the sum of the weights. In the ordinary arithmetic mean, each value is assigned a weight of 1.

**Weir – 1)** A wall or plate in an open channel to measure the flow of water. **2)** A wall or obstruction used to control flow from settling tanks, clarifiers, or a drainage system to ensure a uniform flow rate.

**Wetland function** – A process or series of processes that take place within a wetland that are beneficial to the wetland itself, the surrounding ecosystems, and people.

**Wetlands** – Ecosystems whose soil is saturated for long periods seasonally or continuously, including marshes, swamps, and ephemeral ponds.

**Willow carr** – A pool, or wetland dominated by willow trees or shrubs.

**Withdrawal** – Water removed from the ground or diverted from a surface-water source for use. Also refers to the use itself; for example, public-supply withdrawals or public-supply use. *See also* Offstream use.

## X

**Xerophyte** – A plant adapted for growth under dry conditions.

## Y

**Yield** – The mass of material or constituent transported by a river in a specified period of time divided by the drainage area of the river basin.

## Z

**Zooplankton** – *See* Plankton.