



Water Quality

Glossary of Water Quality Terms

Words within the definitions which are **bold** are themselves defined in the glossary.

A

Absorption

The incorporation of a substance into the body of another, (see **sorption**, **adsorption**).

Accuracy

This is an indicator of how close a measured value comes to the actual or true value (see **precision**).

Acid

A compound resulting in a **pH** less than 7 when in **aqueous solution**, a molecule that can give up a proton to a **base**, accept an unshared pair of electrons from a **base** or react with a **base** to form a **salt**, a substance that has more free hydrogen **ions**, H⁺, than hydroxyl **ions**, OH⁻, (see **alkaline**).

Acidity

Having the properties of an **acid**; a **pH** less than 7.

Activated carbon

Pure carbon heated to promote active sites which can **adsorb pollutants**, used in some **water treatment** systems to remove certain **organic** chemicals and radon gas.

Acute toxicity

As commonly used it is a pronounced effect, severe biological harm or death, produced in an organism by a **toxicant**, a substance or a mixture of substances within a short period of time, usually 96 hours or less, after exposure. The strict implication is simply one of rapid onset of effects, in comparison with the life span of the organism; severity is not necessarily implied. For **algae** and **bacteria** 96 hours would be a **chronic** exposure since it would last for several generations.

Adhesion

The molecular attraction exerted between the surfaces of materials in contact, (see **cohesion**).

Adsorbable organic halides, AOX

The total of all **halogenated organic compounds**, particularly that are **fluoridated**, **chlorinated** or **brominated**, (see **adsorption**, **halides**).

Adsorption

The attachment or **adhesion** of a substance or chemicals generally on the surface of another solid material, **adsorption** is often used to extract **pollutants** by causing them to be attached to materials such as **activated carbon**, (see **sorption**).

Aeration

The addition, by bubbling, mixing or turbulent exposure, of air or oxygen into water, or by spraying the water into the air, increasing the **dissolved oxygen concentration** in the water and dissipating or stripping volatile **contaminants** and other **pollutants** from the water into the air.

Aerobic

The presence of gaseous or **dissolved** oxygen, the presence of or utilizing oxygen, (see **anaerobic**).

Aesthetic

Pleasing or acceptable to the senses, primarily taste, odor and vision.

Algae

A group of **chlorophyll**-containing, non-flowering plants, mostly **aquatic**, although many are **planktonic**, some species are extremely large.

Algal bloom

A bloom of **algae** occurs when their growth is so rapid that they become numerous enough to colour a body of water, a population explosion of **phytoplankton** in response to changing environmental conditions, including **eutrophication** from **wastewater** and **non-point** sources, blooms can result in oxygen depletion and biological impacts such as fish kills, blooms are often the result of urban **runoff** of lawn fertilizers.

Alkaline

Having a **pH** greater than 7, the measurement of constituents in a water supply which determine **alkaline** conditions, the **alkalinity** of water is a measure of its capacity to neutralize **acids**.

Alkalinity

The measurement of chemicals in a water supply which determine **alkaline** conditions, the **alkalinity** of water is a measure of its capacity to neutralize **acids**.

Alluvial

Refers to particles carried by running water which are deposited when the **flow** rate decreases.

Alum

An aluminum sulphate **salt**, generally potassium or ammonium is the **cation**, used to **coagulate** particles in **water treatment**.

Amphipoda

An Order of **Crustacea** which includes shrimp, these numerous small, but generally visible, flea-like organisms which are laterally flattened, are abundant in **marine** environments.

Ambient

Refers to natural background conditions in the surrounding environment outside the zone in which water quality may be influenced by a discharge or source of contamination.

Anadromous

Ascending from the **sea** to **fresh water** for **spawning** at certain seasons.

Anaerobe

An organism that can only exist in the absence or near-absence of gaseous or **dissolved** oxygen.

Anaerobic

Denotes absence of gaseous or **dissolved** oxygen, submerged **sediments** below a narrow oxygenated layer may be **anaerobic**, also refers to metabolic activities, glycolysis, in the absence of oxygen which occurs in some microorganisms.

Anion

A negatively charged **ion**.

Annelids

A phylum of segmented **marine** and **freshwater worms**, distinguished from non-segmented roundworms and flatworms, (see **worms**, **polychaetes** and **oligochaetes**).

Anoxia

Absence of oxygen, (see **anaerobic**, **hypoxia**).

Anthropogenic

Having to do with the activities of man as opposed to those of nature, man-made, -modified or -influenced.

AOX, Adsorbable organic halides

The total of all **halogenated organic compounds** particularly those that are **fluoridated**, **chlorinated** or **brominated**, (see **adsorption**, **halides**).

Aquatic

Living and growing in or on and generally requiring water, (see **freshwater**, **marine**, **brackish**).

Aqueous

Water based; an **aqueous solution** is a **solution** where water is the **solvent**.

Aquifer

Water within the soil or rocks beneath the surface of the earth that supplies **wells** and springs, water in the zone of **saturation** where all openings in rocks and soil are filled with water, the upper surface of which forms the **water table**, the **streams** or pools of water that **flow** or collect under the surface of the land and not on the surface, these may be confined if there are layers of **impermeable** material both above and below and it is under pressure so that when the **aquifer** is penetrated by a **well**, the water will rise above the top of the **aquifer**, or unconfined when the upper water surface, the **water table**, is at atmospheric pressure, and is able to rise and

fall,

any geological formation containing or transmitting water, especially one that supplies the water for **wells** and springs, use of the term may be restricted to those water-bearing formations capable of **yielding** water in sufficient quantity to constitute a usable supply, (see **surfacewater**, **ground water**).

Arithmetic mean

The average of the sum of all the observations, (see **geometric mean**).

Artificial recharge

The process where water is put into **ground water**, or **aquifer**, storage from **surface water** supplies such as **irrigation** water, reclaimed **wastewater** or induced **infiltration** from **streams** or **wells**.

Aromatic

A general term that includes the **organic compounds** containing at least one **benzene** ring.

Assimilative capacity

The amount of **pollution** a water body can receive without noticeable degradation, as a result of the natural ability of the water and its associated chemical and biological systems to dilute or transform **contaminants**.

Atmospheric deposition

The contribution of atmospheric **pollutants** or chemical constituents to land or water ecosystems, deposition results from materials in rain or snowfall, combined with dry dust fallout, atmospheric sources are a significant source of **nutrients** and **contaminant** to **aquatic** systems.

B

Backwashing

Reversing the **flow** of water through a **water treatment filter** or membrane to clean and remove deposits.

Bacteria

Small unicellular organisms lacking a nucleus and some other **eukaryotic organelles**, they may have **photosynthetic** pigments but lack **chloroplasts**, the specialized **photosynthetic organelles** in higher plants, and **mitochondria**.

Base

A compound resulting in a **pH** greater than 7 when in **aqueous solution**, a molecule that can accept a proton from an **acid**, donate an unshared pair of electrons to an **acid** or react with an **acid** to form a **salt**, a substance that has fewer free hydrogen **ions**, H⁺, than hydroxyl **ions**, OH⁻, (see **alkaline**).

Base flow

The volume of **flow** in a **stream** or **river** during dry conditions, as opposed to conditions influenced by storm **runoff**.

Bay

A relatively small body of water partially isolated from the main portion of the **sea**, **ocean** or **lake** by a relatively narrow opening or channel.

Beneficial use

Water used for an **anthropogenically** accepted purpose such as **domestic** and municipal water supply, industry, **irrigation**, mining, hydroelectric power, navigation, recreation, livestock raising, **aesthetics**, **aquatic** life and wildlife, (see **contact recreation**, **non-contact recreation**).

Benthic

Associated with the **sediments** on the bottom of a water body

Benthic organism

Any organism that lives in or near the bottom of a water body or in the **sediment**.

Benthos

The organisms that live in or near the bottom of a water body or in the **sediment**.

Benzene

An **organic compound**, a ring molecule of six carbons and six hydrogens with three shared or resonant double carbon-to-carbon bonds, known as an **aromatic** compound.

Bioaccumulation

The uptake, retention and **concentration** above background levels of environmental substances by an organism from its environment and food, (see **biomagnification**).

Bioassay

The **quantitative** estimation of biologically active substances by the amount of their actions under standardized conditions on or in living organisms; often linked, unnecessarily, with drug testing; some people prefer to simply use **toxicity test**.

Biochemical oxygen demand, BOD

A measure of the amount of **dissolved** oxygen required to completely **oxidize** the available **organic wastes**, a **quantitative** measure of the degree to which **organic** compounds consume oxygen in water, based on a five-day test in which loss of oxygen in a **sample** results from **bacterial** respiration and chemical processes, a traditional water **quality** measurement applied to **wastewater** such as treated **sewage**.

Bioconcentration

The increase of a substance or **contaminant** in a food web such that the organisms eventually contain higher **concentrations** of the substance than their food sources, the magnification of **contaminant concentrations** in organisms due to increased **tissue concentrations** at each successive **trophic** level in a **food chain**, generally, but not always, occurs due to

a **contaminant** being soluble in fatty **tissues** and not in water.
(see **bioaccumulation**, **biomagnification**).

Biomagnification

The increase of a substance or **contaminant** in a food web such that the organisms eventually contain higher **concentrations** of the substance than their food sources, the magnification of **contaminant concentration** in organisms due to increased **tissue concentrations** at each successive **trophic** level in a **food chain**, generally, but not always, occurs due to a **contaminant** being soluble in fatty **tissues** and not in water,
(see **bioaccumulation**, **bioconcentration**).

Biomass

The total amount of biological material present at any given time or over a defined time period, (see **productivity**, **standing crop**).

Biosolids

A **nutrient-rich organic** material resulting from the treatment of **wastewater** which contains nitrogen and phosphorus along with smaller amounts of other **nutrients**, such as potassium, sulfur, magnesium, calcium, copper and zinc, soil that is lacking in these substances can be fertilized with **biosolids** which also improve soil properties and plant **productivity** reducing dependence on **inorganic** fertilizers.

Biota

All living organisms including **bacteria**, plants and animals.

Bioturbation

The disturbance of **sediments** due to displacement by organisms, **bioturbation** resulting from burrowing of organisms in the **benthic habitat** increases **sediment aeration** and influences **contaminant** equilibria with the overlying water.

Blackwater

Wastewater from toilets, latrines, privies, water containing feces or body fluids and water from sinks used for food preparation or disposal of chemical or biological ingredients,
(see **greywater**).

Blue-green algae

Prokaryotic organisms with a **bacteria**-like cell structure, lacking a nucleus and other **organelles**, these species manufacture **photosynthetic** pigments but lack **chloroplasts**, the specialized **photosynthetic organelles** in higher plants, in some situations an increase in **blue-green algae** can indicate an environmental stress such as **pollution**.

BOD, Biochemical oxygen demand

A measure of the amount of **dissolved** oxygen required to completely **oxidize** the available **organic wastes**, a **quantitative** measure of the degree to which **organic** compounds consume oxygen in water, based on a five-day test in which loss of oxygen in a **sample** results from bacterial respiration and chemical processes, a traditional water **quality** measurement applied to **wastewater** such as treated sewage.

Bog

A **wetland** that is perched above the **watertable** and has no direct **hydraulic** connection to it, **bogs** accumulate peat and the vegetation is dominated by sphagnum moss.

Brackish

Water that is neither **fresh water** nor **marine** but a mixture of the two or intermediate in **salinity**, usually found in **estuaries** where the amount of **salinity** is constantly fluctuating.

Brine

Highly **salty** and heavily mineralized water containing **heavy metal** and **organic contaminants**.

Brominated

A compound that has been reacted with the **halide** bromine and now contains at least one bromine atom in the molecule.

Buffer

A compound or **solution** capable of resisting a change in **pH**.

C**Carcinogen**

A substance capable of causing cancer.

Cation

A positively charged **ion**.

CFS, Cubic feet per second

A **quantitative** measure of the **flow**, in **streams** and **rivers**, it is equal to a volume of water one foot high and one foot wide **flowing** a distance of one foot in one second, one **cfs** is equal to 7.48 gallons of water per second.

CFU, Colony forming units

A **quantitative** measure of the **concentration** of **bacteria** in a water **sample**, **bacterial** colonies on laboratory media resulting from **filtering** and culturing **bacteria** from a water **sample**, each colony in the laboratory culture is presumed to have arisen from the multiplication of a single bacterium in the original **sample**.

Chlorinated

A compound that has been reacted with the **halide** chlorine and now contains at least one chlorine atom in the molecule.

Chlorination

The addition of chlorine to water primarily for the purpose of **disinfection** but also for other biological or chemical purposes.

Chlorophenols

Broad spectrum pesticides produced when **phenol** rings have a number of chlorine atoms attached, formerly used in cut lumber treatment to prevent discolouration by **fungus**, often associated with pulpmill effluent and wood preservatives.

Chlorophyll

The coloured pigments, often green, red or brown, found in plants and **algae** which trap and convert light energy to chemically stored energy which is then used to create **organic** molecules from **inorganic** raw materials.

Chlorophyll-a

The primary green-coloured pigment found in plants and **algae** which traps and converts light energy to chemically stored energy which is then used to create **organic molecules** from **inorganic** raw materials.

Chloroplasts

The **organelles**, in **eukaryotic** cells that carry out **photosynthesis**, where the **chlorophyll** pigments and related enzymes are located, specialized structures that carry out **photosynthesis** in plants and **algae**.

Chromosomes

The structures in the nucleus of a **eukaryotic** cell which carries the DNA or genetic material in genes.

Chronic toxicity

A long-term **toxic** effect produced in an organism by a **toxicant**, a substance or a mixture of substances.

Cilia

Many short fine hairs on the cell surface which are used for locomotion or food gathering in many microscopic organisms and their **larvae**.

Ciliate

Having many **cilia** on the surface which are used for locomotion or food gathering.

Coagulation

The use of chemicals to make **suspended solids clump** together into larger aggregates, flocs, for easier **filtration** or **sedimentation**, **coagulation** in **water treatment** uses **alum** to congregate solids in the water into a mass that can be readily trapped by a **filter**, (see **flocculation**).

Cohesion

The molecular attraction by which the particles of a body are united throughout the mass, whether like or unlike, (see **adhesion**).

Coliform

Non-**pathogenic** natural gut **bacteria** monitored when testing water to indicate the possible presence of **pathogenic bacteria**.

Colloids

Finely divided solids which will not **settle** out by gravity alone but which may be removed by **coagulation** or biochemical action.

Colony forming units, CFU

A **quantitative** measure of the **concentration** of **bacteria** in a water **sample**, **bacterial** colonies on laboratory media resulting from **filtering** and culturing **bacteria** from a water **sample**, each colony in the laboratory culture is presumed to have arisen from the multiplication of a single bacterium in the original **sample**.

Combined sewer

A **sewer** system that carries both **sanitary sewage** and **stormwater runoff**, when **sewers** are constructed this way, **wastewater** treatment plants have to be sized to handle **stormwater flows** and often some of the water receives little or no treatment during overflows or bypasses during extreme storm events, (see **separate sewer**).

Combined sewer overflow

A point in a **sewer** collection system where **domestic sewage** mixed in varying proportions with **stormwater** overflows to a receiving water body.

Composite sample

A series of **samples** taken over space and/or time to determine the average condition of an area or a time period, (see **grab sample**).

Concentration

Quantitative amount of a **solute**, chemical or **pollutant** in a specified volume or weight of **solvent**, air, water, soil or other medium, accumulating a level of some material over and above the level found in the **ambient** environment, generally applied to an organism.

Condensation

The change of state from a gas to a liquid, (see **evaporation**, **sublimation**, **vapourization**, **transpiration**, **evapotranspiration**).

Consumptive use

The **quantity** of water not available for reuse since it is incorporated into a product or in some way at least temporarily removed from the **water cycle**, **evapotranspiration**, **evaporation**, incorporation into plant **tissue**, **infiltration** into **ground water** and consumption by humans, wildlife or livestock, are some of the reasons water may not be immediately available for reuse. (see **non-consumptive use**).

Contact recreation

Activities involving a significant risk of ingestion of water, such as wading by children, swimming, water skiing, diving and surfing, human activity involving bodily contact with water and therefore the potential for increased risk to health when **contaminants** or **pathogens** are present, (see **non-contact recreation**).

Contaminant

A substance that causes harm by contact or association, **sewage** or other materials that will

render water unfit for its intended use, anything added to a substance that makes the substance impure or unfit for its intended use, (see **pollutant**).

Contamination

Introducing a substance into water that causes harm by contact or association, the introduction into water of **sewage** or other materials that will render the water unfit for its intended use, (see **pollution**).

Copepoda

Subclass of **Crustacea**, small **aquatic invertebrates** that are food for fish, free living forms are common in **benthic** and **planktonic samples**, some species are parasitic.

Crustacean

A class of segmented Arthropod organisms with an exoskeleton, a pair of appendages on each segment and two pairs of antennae, includes crabs, lobsters, crayfish, shrimp, wood lice, barnacles and water fleas or *Daphnia*.

Cubic feet per second, CFS

A **quantitative** measure of the **flow**, in **streams** and **rivers**, it is equal to a volume of water one foot high and one foot wide **flowing** a distance of one foot in one second, one **cfs** is equal to 7.48 gallons of water per second.

D

Deionized water

Water free of inorganic chemicals

Delta

An **alluvial** deposit consisting of rock particles, **sediment** and debris, dropped by a **stream** or **river** as it enters another body of water, the fan-shaped deposit where a **river discharges** to a larger, slower moving water body, important for **wetland habitat** values.

Denitrification

The natural chemical conversion of **dissolved** nitrite nitrogen to nitrate and finally to gaseous nitrogen, removing it from the **aquatic** system.

Desalination

The process of **salt** removal from **sea** or **brackish** water, the removal of **salts** from **saline** water to provide **fresh water**, an increasingly popular way of providing **fresh water** to coastal populations.

Designated water use

A **water use** that is to be protected at a specific location for such purposes as use by **aquatic** life or wildlife, for **irrigation** or stock watering, in **industrial** activities, for recreation or as drinking water, (see **contact recreation**, **non-contact recreation**).

Detection limit

The lowest **concentration** of a substance in water that can be reproducibly determined by a specific analytical procedure or test method.

Diatom

A group of **phytoplankton** species utilizing silica as a structural component of the cell wall, a dominant component of the **plankton** population in many areas.

Diffuser

A structure composed of perforated pipes, placed at the end of an **outfall** pipe, which is designed to spread the **effluent** widely so as to facilitate **dilution**.

Dilution

The process of mixing a liquid, usually water, that has a lower **concentration** of a substance or **pollutant** with **effluent** containing the substance or **pollutant**, or the **pollutant** or substance itself, such that the final **concentration** after mixing is lower than that in the **effluent** or of the pure substance.

Dinoflagellate

A unicellular, generally motile species of **planktonic algae** with two whip-like **flagella** arranged in a characteristic pattern, this group includes some common **plankton** species and also **red tide** organisms such as *Gonyaulax monilata* and *Ptychodiscus brevis*.

Dioxins

Toxic **organic compounds** containing a specific complex **aromatic** ring structure and containing at least one chlorine atom in the molecule, (see **furans**).

Diploid

The condition when there are two complimentary sets of **chromosomes** in a cell which occurs after **fertilization** and remains so until the cell undergoes **meiosis** to form **haploid eggs** and **sperm**.

Discharge

The release of water which may or may not contain **waste** into the environment, often via a pipe or ditch into a **stream**, the volume of water that passes a given point within a given period of time, an all-inclusive outflow term, describing a variety of **flows** such as from a pipe to a **stream** or from a **stream** to a **lake** or **ocean**, usually expressed in **cubic feet per second**.

Disinfectant

A chemical usually an **oxidant**, such as chlorine, chloramine, ozone, hydrogen peroxide or potassium permanganate, or radiation, such as ultraviolet light or ionizing radiation which destroys **pathogens** in water, a substance or action used to purify a medium and kill or inactivate infectious organisms, chlorine is currently the most common **disinfectant** used with water.

Disinfection

The process of destroying microorganisms in water by the application of a **disinfectant**, killing most of the harmful and objectionable **bacteria** in **sewage** or **drinking**

water usually accomplished by introduction of chlorine or exposure to **ultraviolet radiation** which sterilizes the **bacteria**.

Disinfection byproducts

Chlorinated organic chemicals, including **trihalomethanes**, are formed when water containing **organic** materials is **disinfected** with chlorine, these compounds are **toxic**, the formation of these compounds can be minimized by **filtering** or otherwise removing the **organic** compounds before **chlorination**.

Dispersion

The movement and spreading of **contaminants** from the point of introduction in an **aquifer** or **surface water** body.

Dissolve

The process by which solid particles separate from the mass and mix molecule by molecule with a liquid and appear to become part of the liquid.

Dissolved

Separated into individual atoms or molecules and dispersed in a liquid like water.

Dissolved metals

In a liquid, metals which pass through a **filter** of a designated **pore** size, are assumed for environmental purposes to be **dissolved**.

Dissolved organic matter, DOM

Carbon compounds in water **solution**, generally from the decomposition of natural plant and animal **tissues**, but including some **anthropogenic contaminants**.

Dissolved oxygen, DO

The amount of oxygen gas **dissolved** in a given **quantity** of water at a given temperature and atmospheric pressure, usually expressed as a **concentration** in parts per million, **ppm**, or as a percentage of **saturation**.

Dissolved oxygen deficit, DO deficit

The difference between the oxygen **saturation** value in water as calculated for the measured conditions at the point and time of sampling, and the actual oxygen **concentration**, the measure is useful because it corrects for temperature, **salinity**, and atmospheric pressure which influence the **saturation** level, a high deficit can be an indicator of a water **quality** problem.

Dissolved solids

Inorganic material **dissolved** in water or liquid **wastes**, excessive **dissolved** solids make water unsuitable for drinking or **industrial** uses, (see **TDS, total dissolved solids**).

DO, Dissolved oxygen

The amount of oxygen gas **dissolved** in a given **quantity** of water at a given temperature and atmospheric pressure, usually expressed as a **concentration** in parts per million, **ppm**, or as a percentage of **saturation**.

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DOM, Dissolved organic matter

Carbon compounds in water **solution**, generally from the decomposition of natural plant and animal **tissues**, but including some **anthropogenic contaminants**.

Domestic

Of or related to a household or dwelling as opposed to an industry.

Domestic water use

Water used for household purposes, such as drinking, food preparation, bathing, washing clothes, dishes and dogs, **flushing** toilets and watering lawns and gardens, most **domestic** water is delivered to homes by a public water supply facility.

Drainage area

The **drainage area** of a **stream** or **river** at a specified location is that area, measured in a horizontal plane, enclosed by a topographic divide from which direct surface **runoff** normally drains by gravity into the **stream** above the specified location.

Drainage basin

The land area where precipitation runs off into **streams, rivers, lakes** and **reservoirs**, a land feature that can be identified by tracing a line along the highest elevations between two areas on a map, often a ridge, large **drainage basins** contain many smaller drainage sub-basins, (see **watershed**).

Drawdown

A lowering of the **ground water** surface caused by pumping from an **aquifer** or lowering the water surface in a **reservoir** by releasing water either through the turbine or outlet pipes or over the spillway.

Drinking water

A water supply, treated or untreated which is intended for human consumption and uses and which is considered to be free of **toxins** and **pathogenic bacteria**, cysts or **viruses**, **potable** water, fit to drink, **potable** water that has or is to be treated additionally, to enhance **aesthetic quality** and/or reduce mineral content plus other known or unknown, undesirable substances: by one or more point-of-use water processing devices or systems or purified bottled water.

Dyne

Metric unit of force, energy needed to accelerate 1 gram at 1 centimetre/second².

Effluent

The out-flow water or **waste water** from any water processing system or device, softeners, **filters** or **reverse osmosis** units, the product water of a given **water treatment** system, alternatively a general term in **waste water treatment** for the final water which is **discharged** from a treatment plant, usually into a natural **flowing river** or **stream**, after complete treatment steps which meet current **effluent water quality standards**, **effluent water** is often **recycled** as **irrigation** water for golf courses, parklands and some agricultural applications, particularly a liquid, that enters the environment from a point source, generally refers to **wastewater** from a **sewage** treatment or **industrial** plant.

Egg

A large immobile **gamete** produced by the female organism which contains one **haploid** set of **chromosomes** and unites with the **sperm** to bring about **fertilization**.

Electrodialysis

The **salts** are extracted from the water by using a membrane with an electrical current to separate the **ions**, positive **ions** go through one membrane, while the negative **ions** flow through a different membrane, leaving the **fresh water** behind.

Emergent wetlands

Marshes in which vegetation is rooted underwater with only the tops exposed, in contrast to fully submerged **aquatic** vegetation or upland **habitats** where the roots are also above the water surface.

Enteric

Associated with the gut or intestines of animals or gut products such as feces.

Enteric viruses

A group of **viruses** associated with human feces found in water.

Enterocci

Bacteria species which live in the gut of man or other **homeothermic** animals, some are **pathogens**, often used instead of **fecal coliform bacteria** as an **indicator** of water **contamination**.

Epibenthic

Located at the surface of the **sediments**, generally referring to **algae**.

Epilimnion

The upper, warmer, less dense zone of water in a **lake**, separated by the fairly thin **thermocline** zone, from the lower, colder, denser zone of water, the **hypolimnion**.

Erg

Metric unit of work, 1 **dyne** over a distance of 1 centimetre.

Erosion

The wearing away of the land surface by wind, water, ice or other geologic agents, occurs naturally from weather or **runoff** but is often intensified by human land use

practices, **erosion** is a source of **sediments, suspended sediments, TDS, total dissolved solids, particulate matter turbidity** and **solutes** in natural waters.

Estuary, Estuaries, Estuarine zone

The lower portion of a **river** where the **ocean** and the **river** mix, the semi-enclosed zone along a coastline where **fresh water** meets and mixes with the **ocean**, such as a **bay**, mouth of a **river**, **salt marsh** or **lagoon**, deepwater tidal **habitat** and tidal **wetland**, they are usually partially enclosed by land but have free access to the **ocean** and are at least occasionally diluted by **fresh water runoff** from the land.

Eukaryotic

Organisms whose cells have a nucleus, **chloroplasts** in plants and **mitochondria**, (see **prokaryotic**).

Euphotic

The surface layer of an **ocean, lake**, or other body of water into which light can penetrate, also known as the zone of **photosynthesis**.

Eutrophic

Having a large or excessive supply of plant **nutrients**, nitrates and phosphates, usually resulting in an increase in **biomass** and **productivity**, (see **oligotrophic**).

Eutrophication

The process of increasing the **nutrients**, primarily nitrate and phosphate, content of natural waters, usually resulting in an increase in **biomass** and **productivity** of **algae** which may result in the depletion of the oxygen **concentration** in the water leading to a fish kill, from natural **erosion** and **runoff** from the land or from **anthropogenic** sources.

Evaporation

The change of state from a liquid to a gas, the change by which any substance is converted from a liquid state and carried off as a vapor, the process of liquid water becoming water vapor from water surfaces, land surfaces and snow fields, (see **condensation, sublimation, vapourization, transpiration, evapotranspiration, volatilization**).

Evapotranspiration

The combination of **evaporation** and **transpiration** of water into the atmosphere from living plants, the water surface and soil.

F

Fecal

Refers to **waste** matter, feces, from the gut or gastrointestinal tract of animals.

Fecal coliform bacteria

Enteric bacteria which ferment lactose with gas and **acid** formation at a temperature typical of warm-blooded animals, in water, **fecal coliforms** are commonly used as an **indicator** of **contamination** and are normally measured using **filtration** and culture on disk media, the portion of the **coliform bacteria** group which is present in the intestinal tracts and feces of warm-blooded animals, a common **pollutant** in water, (see **most probable number, MPN**).

Fen

A **wetland** that is at the **water table** and has a direct **hydraulic** connection to it, **fens** accumulate peat and the vegetation is dominated by sphagnum moss and small herbs.

Fertilization

The process where **haploid eggs** and **sperm** unite to form a **diploid zygote** and begin a new generation.

Filter

A device used to remove solids from a mixture or to separate materials, materials are frequently separated from water using **filters**, a **screening** device or **porous** substance used as a strainer for removing solid material from liquids.

Filtering, Filtration

Passing a **solvent** with **particulate** material **suspended** in it through a material which allows the **solvent** to pass but retains the **particulates**, the mechanical process which removes **particulate** matter by separating water from solid material, by passing it through a **filter** such as sand in many water **filtration** plants.

Flagella

Several long stout hairs on the cell surface which are used for locomotion or food gathering in many microscopic organisms and their **larvae**.

Flagellate

Having several long stout hairs on the cell surface which are used for locomotion or food gathering.

Flocculation

A large scale treatment process involving gentle stirring whereby small particles in flocs are collected into larger particles so their weight causes them to **settle** to the bottom of the treatment tank, (see **coagulation**).

Flood

An overflow or inundation that comes from a **river** or other body of water and causes or threatens damage, it can be any relatively high streamflow overtopping the natural or artificial banks in any reach of a **stream**, also a relatively high **flow** as measured by either gauge height or **discharge quantity**.

Flood plain

A strip of relatively flat and normally dry land alongside a **stream, river** or **lake** that is covered by

water during a **flood**, land next to a **river** that becomes covered by water when the **river** overflows its banks.

Fluoridated

A compound that has been reacted with the **halide** fluorine and now contains at least one fluorine atom in the molecule.

Flow

The **quantitative** rate of water **discharged** from a source, or passing by a given point, expressed as volume per unit of time, (see **CFS, cubic feet per second**).

Flushing

A measure of how often, usually measured in years, water is replaced in a **reservoir, bay** or other system, based upon **flow** rates into and out of the system, (see **residence time**).

Food chain

The transfer of food energy from producers through a series of consumers.

Food web

A series of inter-connecting and inter-related **food chains**.

Fraser River Estuary

The area of joint social, economic and environmental concerns which, for the purposes of the FREMP Agreement, means in general, the land and water outside the boundary of the dykes and between Kanaka Creek and the outlet from Pitt Lake in the east, the **estuary** drop off in the west, Point Grey to the north, and the international boundary to the south, including Boundary Bay and Semiahmoo Bay.

Fresh water

Lakes and **ivers** running off the land to the **sea** and having much lower **solute concentrations** than the **ocean** into which most eventually drain, water containing less than 1,000 parts per million, **ppm** of **dissolved** solids of any type, water that contains less than 1,000 milligrams per liter, mg/L, of **dissolved** solids, generally, more than 500 mg/L of **dissolved** solids is undesirable for drinking and many **industrial** uses, (see **saline** water).

Freshet

An influx of **freshwater** inflow, for example following seasonally high rain and snowfall or the spring melt.

Freshwater

An adjective to describe water that meets the definition of **fresh water**.

Fully recorded

The situation where all the available water in a waterbody is allocated or authorized for use through licences.

Fungi, fungus

A major group of multicellular organisms that are non-**photosynthetic** and often **saprophytic**, **pathogenic** or **parasitic**.

Furans

Toxic **organic compounds** containing a specific complex **aromatic** ring structure and containing at least one chlorine atom in the molecule, (see **dioxins**).

G**Gamete**

Sperm produced by the male organism or **eggs** produced by the female organism, which contain one **haploid** set of **chromosomes**, they unite to cause **fertilization** and a **diploid zygote**.

Gastropod

Organisms in the Class **Gastropoda** of the Phylum **Mollusca**, the snails and similar organisms with an asymmetrical, spirally-coiled shell.

Geometric mean

The Nth root of the product of N observations, (see **arithmetic mean**).

Grab sample

A single **sample** taken at a given place and time, (see **composite sample**).

Green Algae

A common **algae** group, often green in colour, with nucleated cells and **photosynthetic** pigments contained in **organelles** called **chloroplasts**.

Greywater

Wastewater from clothes washing machines, showers, bathtubs, handwashing, lavatories and sinks that are not used for disposal of chemical or chemical-biological ingredients or feces, (see **blackwater**).

Ground water

Water within the earth that supplies **wells** and springs, water in the zone of **saturation** where all openings in rocks and soil are filled, the upper surface of which forms the **water table**, water that **flows** in **aquifers** under the surface of the land and not on the surface, water that **flows** or seeps downward and **saturates** soil or rock, the upper surface of the **saturated** zone is called the **water table**, water beneath the surface of the ground, consisting largely of **surface water** that has seeped down, water beneath the earth's surface, occurring in **aquifers** at one or more depth levels, (see **surface water**).

Ground water hydrology

The branch of **hydrology** that deals with **ground water**, its occurrence and movements,

its replenishment and depletion, the properties of rocks that control **ground water** movement and storage and the methods of investigation and utilization of ground water.

Ground water recharge

The inflow of water to a **ground water reservoir**, primarily from the surface, **infiltration** of rain and snowfall and its movement to the **water table** is one form of natural **recharge**, the volume of water added by this process, (see **ground water**).

Ground water reservoir

An **aquifer** or **aquifer** system in which **ground water** is stored, water may be placed in the **aquifer** by artificial or natural means.

H

Habitat

A place within an ecosystem with a particular kind of environment whereby organisms, populations or communities live, feed, reproduce or grow.

Halide

One of the very reactive elements in column 7 of the periodic table that are only one electron short of a full outer orbital, primarily fluorine, chlorine and bromine.

Halogenated

A compound that has been reacted with, and now contains, one of the elements in column 7 of the periodic table that are only one electron short of a full outer orbital, primarily fluorine, chlorine and bromine.

Haploid

The condition when there is only one set of **chromosomes** in a cell which occurs after **meiosis** to form **eggs** and **sperm**.

Hard water

Water containing a high level of calcium, magnesium, and other minerals, **hard water** reduces the cleansing power of soap and produces scale in hot water lines, boilers and appliances.

Hardness (water)

A condition caused predominantly by **dissolved salts** of calcium, magnesium and iron, such as bicarbonates, carbonates, sulfates, chlorides and nitrates, a water-**quality** indicator of the **concentration** of **alkaline salts** in water, **hard water** requires more soap, detergent or shampoo to raise a lather.

Headwaters

The source and upper reaches of a **stream**, also the upper reaches of a **reservoir**, the

water upstream from a structure or point on a **stream**, the small **streams** that come together to form a **river**, any and all parts of a **river** basin except the mainstream river and main tributaries.

Heavy metals

Metallic elements of high molecular weight, typically with **specific gravities** greater than 5, a few examples include copper, lead and zinc.

Hepatic

With reference to the liver.

Hermaphrodite

An organism containing functional male and female reproductive organs.

Homeothermic

Animals which control their own body temperature at some fixed value, warm-blooded animals, (see **poikilothermic**).

Hydraulic

Related to water and the **flows** and pressures within a connected water-containing system.

Hydrograph

A chart that measures the amount of water **flowing** past a specified point as a function of time.

Hydrologic

With reference to water and the **water cycle** in the environment.

Hydrologic cycle

The natural pathway water follows as it changes between liquid, solid, and gaseous states; biogeochemical cycle that moves and recycles water in various forms through the environment, **evaporation** from **oceans** to the atmosphere, rain and snowfall to the earth's surface, replenishment of **ground water**, **runoff**, uptake by plants, and storage in **oceans** and ice caps, the movement of water from the atmosphere to the earth and its return to the atmosphere through **condensation**, precipitation, **evaporation** and **transpiration**, the cyclic transfer of water from the Earth's surface via **evapotranspiration** into the atmosphere, from the atmosphere via precipitation back to earth, and through **runoff** into **streams**, **rivers**, and **lakes** and ultimately into the **oceans**, (see **water cycle**).

Hydrology

The science that deals with the **hydrologic cycle** or **water cycle** in the environment-land, soil and atmosphere; properties, distribution and circulation of water.

Hydrophobic

Literally, hating water, materials that do not **dissolve** in water but tend to **dissolve** in **organic solvents** and fats or **sorb** to **sediments**, (see **hydrophilic**).

Hydrophilic

Literally, loving water materials that do **dissolve** in water not in **organic solvents** and fats and are found in the **water column**, (see **hydrophobic**).

Hypolimnion

The colder, lower, denser zone of water in a **lake**, separated by the fairly thin **thermocline** zone, from the upper, warmer, less dense zone, the **epilimnion**.

Hypoxia

Depletion of **dissolved** oxygen in water to low levels, for example less than two mg/L, which can result from natural or human introduction of materials with a high **BOD** or from **eutrophication** resulting from high **nutrient concentrations**, (see **anoxia**, **anaerobic**).

I

Impermeable

A surface or membrane through which water, or other liquids, will not penetrate, a layer of solid material, such as rock or clay, which does not allow water to pass through, any material that does not permit fluids to penetrate.

Impervious

A material through which water, or other liquids, will not penetrate and thus must run off over the surface or accumulate on the top, surfaces with a low capacity for soil **infiltration**, paving, roofs, roadways or other human structures, **impervious** cover increases **runoff** and affects the **quantity** and composition of **non-point source pollution**, the quality or state of being **impermeable**, resisting penetration by water or plant roots.

Indicator organism

Microorganisms, such as **coliform bacteria**, that are not in themselves harmful but whose presence is indicative of possible **pollution** or the presence of other more harmful microorganisms which, through its population size or condition, mirrors environmental conditions within an ecosystem.

Indicator tests

Tests for a specific **contaminant**, organism, group of **contaminants** or constituent which signals the presence of something else, **coliforms** indicate the possible presence of other **pathogenic bacteria**, tests for a specific **contaminant**, or constituent which signals the possible presence of something else.

Industrial water use

Water used for **industrial** purposes in such industries as steel, chemical, paper and petroleum refining, primarily from private sources, such as local **wells** or **withdrawal** points in a **river**, but some comes from public sources.

Infiltration

Flow of water from the land surface into the subsurface.

Initial dilution zone

Areas immediately adjacent to a **wastewater discharge** in which **chronic water quality objectives** for water or sediment, but not those for fish, may be exceeded; however, they may not exceed the **acute** objectives; they are defined on a **site-specific** basis and may not encroach on water intakes, bathing beaches, shellfish beds, fish spawning and rearing areas, areas of sensitive aquatic vegetation or other specified sensitive areas.

Injection well

A **well** constructed for the purpose of injecting treated **wastewater** directly into the ground, **wastewater** is generally pumped into the **well** for dispersal or storage into a designated **aquifer**, one that does not deliver **drinking water**, an unused **aquifer** or below the levels of **fresh water**.

Inorganic chemicals or compounds

Usually chemicals or compounds which do not contain carbon atoms or if so the carbon atoms are not connected directly to each other in long chains, generally substances not made by living organisms.

Instream use

Use of water that does not require **withdrawal** or diversion from its natural watercourse, the use of water for navigation, recreation and **habitat** for fish and wildlife, (see **contact recreation, non-contact recreation**).

Intake

The place at which a fluid is taken into a channel or pipe, the location where water is withdrawn from a **stream**.

Invertebrate

An organism without a backbone.

Ion

A negatively or positively charged atom or molecule which has either an excess or shortage, respectively, of electrons.

Irrigation water

Water application on lands to assist in the growing of crops and pastures or to maintain vegetative growth in recreational lands, such as parks and golf courses, water which is applied to assist crops in areas or during times where rainfall is inadequate, the controlled application of water for agricultural purposes through man-made systems to supply water requirements not satisfied by rainfall.

Isopod

A member of the **Crustacean** Order **Isopoda**, small but generally visible species flattened from top to bottom, common **benthic** and **epibenthic invertebrates**.

Jet

A concentrated, high velocity **flow** of water capable of causing **erosion**, used in mining some placer deposits to wash the unconsolidated deposits into sluice boxes.

Joule

The metric unit of work or energy, 1×10^7 **ergs**, 1 **joule** is about 0.7375 foot-pounds.

K**Kilifish**

Small **oviparous** Cyprinodontidae or **ovoviviparous** Poeciliidae, fish used in **bioassays** and for mosquito control or as bait.

L**Lacustrine**

Relating to a **lake** environment.

Lagoon

A shallow **pond** where sunlight, **bacterial** action and oxygen work to purify **wastewater**, typically used for the storage of **wastewaters**, **sludges**, liquid **wastes** or spent nuclear fuel, a shallow sound, channel or **pond**, near and generally connected to, a larger body of water.

Lake

A generally permanent inland body of **fresh water** of considerable size occupying a basin or hollow in the earth's surface.

Larva

Singular, the pre-adult form in which some animals with multiple life stages hatch from the **egg**.

Larvae

Plural, the pre-adult form in which some animals with multiple life stages hatch from the **eggs**.

Leachate

Water containing **contaminants** which leaks from a disposal site such as a landfill or dump.

Leaching

Extraction or **flushing** out of **dissolved** or **suspended** materials from the soil, solid **waste** or another medium by water or other liquids as they **percolate** down through the medium to **ground water** or **flow** laterally through the **waste** material, the process by which soluble materials in the soil, such as **salts**, **nutrients**, pesticide chemicals or **contaminants**, are washed into a lower layer of soil or are **dissolved** and carried away by water.

Lentic

Static or standing, non-flowing waters such as **lakes, ponds** and **reservoirs**, (see **lotic**).

Limnology

The scientific study of physical, chemical and biological conditions and interactions in **lentic** systems, **lakes, ponds** and **reservoirs**.

Littoral zone

Area on or near the shore of a body of water in relatively shallow water.

Livestock water use

Water used for livestock watering, feed lots, dairy operations, fish farming, and other on-farm needs.

Loading

The rate of introduction of a constituent or **contaminant** to a receiving water from the environment, significant in relation to the volume and circulation of the receiving water, problems occur when high **loadings** occur into receiving waters with limited **assimilative capacity**.

Lotic

A **flowing** body of **fresh water**, such as a **river** or **stream**, (see **lentic**).

M**Mainstem**

The main course of a **river** or **stream** where most of the water flows most of the time.

Marine

Refers to the **ocean** or to a **sea, saltwater**.

Marsh

A **wetland** that is usually submerged in shallow water and whose vegetation is dominated by herbs.

Maximum contaminant level, MCL

The greatest amount of a **contaminant** that can be present in water without causing a risk to its intended use, the maximum level of a **contaminant** allowed in water to maintain **aquatic** life, to minimize **pollution**, to permit recreation or allow the water to be used as a **drinking water** source, (see **contact recreation**, **non-contact recreation**).

MCL, Maximum contaminant level

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Meiosis

The process of cell division which separates the pair of complementary **chromosomes** to produce **eggs** and **sperm** with only one set of **chromosomes** each.

Metalloid

Resembling a metal, or having chemical properties similar to metals.

Methylation

The process whereby a compound is modified chemically, often through **bacterial** action, by the replacement of a hydrogen atom by a methyl group, $-CH_3$.

Mg/L, Milligrams per litre

A **concentration** unit of chemical constituents in **solution**, the weight of **solute** per unit volume of **solvent**, usually water, this measure is equivalent to parts per million or **ppm**.

Micrograms per litre, μ/L

A **concentration** unit of chemical constituents in **solution**; the weight of **solute** per unit volume of **solvent**, usually water, one thousand **micrograms per liter** is equivalent to **1 milligram per litre**, this measure is equivalent to parts per billion or **ppb**.

Micron, μ

A **quantitative** measure of thickness equal to one millionth of a meter, one thousandth of a millimeter, one **ppm**.

Milligrams per litre, Mg/L

A **concentration** unit of chemical constituents in **solution**, the weight of **solute** per unit volume of **solvent**, usually water, this measure is equivalent to parts per million or **ppm**.

Mitochondria

The **organelles** in **eukaryotic** cells that carry out **terminal respiration**, specialized structures that carry out respiration and store energy.

Mollusca

An organism in the **invertebrate** Phylum **Mollusca**, a major group of **marine**, **aquatic** and terrestrial animals which are soft bodied and usually have a hard shell, examples are clams, mussels, snails, octopus and squid.

Monitoring

To check, measure or examine **water quality over** a period of time to note any changes which may occur.

Most Probable Number, MPN

The statistically determined number that represents the number of individual **bacteria** most likely to have been present in a given **sample**, measurement of **fecal coliform indicator bacteria** based on gas production in tubes, alternative to the standard **fecal coliform** test involving **filtration** and culture on disk media.

MPN, Most Probable Number

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Municipal sewage

Sewage from a community which may be composed of **domestic sewage**, **industrial wastes** or both.

Muscle

Tissue consisting of cells which are highly contractile, most of the edible portions of animal flesh is **muscle**.

Muskeg

A **wetland** or **peatland** such as a **fen** or **bog** that accumulates peat and whose vegetation is dominated by sphagnum moss and small shrubs or herbs.

N**Nekton**

Aquatic animals in the **water column** with sufficient powers of locomotion to overcome currents and go where they want under their own power as opposed to the **plankton** which, although some are motile, are at the mercy of water currents, fish are examples of the **nekton**.

Nephelometric turbidity unit, NTU

The unit of measure for the **turbidity** of water, a measure of the cloudiness of water as measured by a nephelometer, based on the amount of light that is reflected off particles in the water.

Non-consumptive use

Using water in a way that does not reduce the immediate supply such as hunting, fishing, boating, water-skiing, swimming and some power production, (see **consumptive use**).

Non-contact recreation

Recreational pursuits not involving a significant risk of water ingestion, including fishing, commercial and recreational boating, and limited body contact incidental to shoreline activity, (see **contact recreation**).

Non-filterable residue

Solids that are not in true **solution** and that can be removed by **filtration** they usually contribute directly to **turbidity**, small particles of solid **pollutants** that resist separation by conventional methods; operationally greater than 0.45 microns in size; also known as **suspended solids**, **suspended matter** or **suspended sediment**.

Non-point Source Pollution, NPS

Constituents in water, including **pollutants**, originating from diffuse, land-based sources and generally transported in **runoff** from precipitation, **pollution discharged** over a wide land area, not from one specific location, diffuse **pollution** caused by **sediment, nutrients, organic** and **toxic** substances originating from land-use activities, which are carried to **lakes** and **streams** by surface **runoff, contamination** that occurs when rainwater, snowmelt or **irrigation** washes off plowed fields, city streets or suburban backyards. As this **runoff** moves across the land surface, it picks up soil particles and **pollutants**, such as **nutrients** and pesticides, source of **pollution** in which **wastes** are not released at one specific, identifiable point but from a number of points that are spread out and difficult to identify and control, (see **point source pollution**).

Non-porous

A material which does not allow water to pass through it, (see **porous**).

Non-potable

Not suitable for drinking due to **toxins, pathogens** or **aesthetics**, (see **potable**).

NTU, Nephelometric turbidity unit

The unit of measure for the **turbidity** of water, a measure of the cloudiness of water as measured by a nephelometer, based on the amount of light that is reflected off particles in the water.

Nutrient

A substance, element or compound, necessary for the growth, development and reproduction of plants and animals, as a **pollutant** any element or compound, such as phosphorous or nitrogen that encourages abnormally high **organic** growth in ecosystems, (see **eutrophic**).

Nutrient cycle

Chemical transformations of nitrogen, phosphorus, silica and other essential elements in continuous cycles between **organic** and living systems and **inorganic** and non-living phases in an ecosystem as organisms grow and die.

O

Ocean

The large, permanent body of **saline** water surrounding the continents and covering most of the surface of the earth.

Oligochaetes

Primarily **fresh water** or terrestrial **hermaphroditic annelid worms** that lack a distinctive head segment, (see **worms, polychaetes**).

Oligotrophic

Having a low supply of **nutrients** and thus a low **productivity** or **biomass**, (see **eutrophic**).

Organelles

The structures in **eukaryotic** cells, notably **chloroplasts** and **mitochondria**, specialized structures that carry out respiration, **photosynthesis** and other functions in the cell.

Organic chemicals or compounds

Usually chemicals or compounds which contain carbon atoms; usually chains of carbon atoms connected directly to each other, chemicals containing carbon, **organic** matter, plant and animal residues, or substances made by living organisms.

Organic contaminants

Organic chemicals which are **toxic** to organisms; they may be persistent and mobile in the environment.

Osmosis

The movement of water molecules through a thin membrane while leaving the **dissolved salts** behind, the process occurs in our bodies and is also a technical and commercial method of removing **salts** from **saline** water.

Outfall

The end of the pipe leading from a **sewage** treatment plant which delivers the **wastewater** to the environment, often via a **diffuser**, the **discharge** point for a **wastewater flow**, for example from a **sewage** treatment plant or refinery, the place where a **wastewater** treatment plant **discharges** treated water into the environment, the place where a **sewer**, drain, or **stream discharges**, the outlet or structure through which reclaimed water or treated **effluent** is finally **discharged** to a receiving water body.

Oviparous

Fish and other organisms that produce **eggs** which hatch externally, **fertilization** may be internal or external, the **fertilized eggs** are self-contained and receive no **nutrients** from the mother.

Ovoviviparous

Fish and other organisms that produce **eggs** which hatch internally, **fertilization** is internal, the **fertilized eggs** are self-contained and receive no further **nutrients** from the mother.

Oxidation

Literally — combining with oxygen, chemically — transfer of electrons in a chemical reaction.

Oxygen demand

The need for molecular oxygen to meet the needs of biological and chemical processes in water, even though very little oxygen will **dissolve** in water, it is extremely important in biological and chemical processes, (see **BOD, biochemical oxygen demand**).

PAHs, Polycyclic aromatic hydrocarbons

A family of **organic compounds** with several linked **aromatic** rings in their structure which are derived from the combustion of fossil fuels, the higher molecular weight **PAHs** are an environmental concern due to their **bioaccumulation** in organisms and their **toxic** and **carcinogenic** activity.

Palustrine

Relating to a **freshwater** environment, such as a **marsh, fen, lake, pond, river, bog** or **swamp**.

Parasite, parasitic

Organisms that are **pathogens** and are obliged to live on or in other organisms, often causing disease or death.

Particulate

Consisting of many small individual particles, not **dissolved**.

Pathogen

An organism, generally a microorganism, causing, or capable of causing, disease or death, a disease-producing agent, usually applied to a living organism, any **worms, protozoans, viruses, bacteria** or **fungi** that cause disease.

Pathogenic

Causing, or capable of causing, disease or death, generally applied to microorganisms.

PCBs, Polychlorinated biphenyls

Man-made liquid chemicals that are stable, non-corroding, fire resistant, toxic and relatively non-biodegradable, once used in electrical transformers because of these properties and in paint, composed of two joined **phenol** molecules that have chlorine atoms replacing many of the hydrogen atoms, frequently found in **industrial wastes**, and subsequently in **surface water** and **ground waters**, accumulate in the environment, particularly in the **sediment** where they can remain indefinitely, virtually banned in 1979 but continuing to appear in the flesh of fish and other animals.

Peak flow

The maximum instantaneous **discharge** of a **stream** or **river** at a given location, usually occurs at or near the time of maximum height.

Peatland

A **wetland** such as a **fen** or **bog** that accumulates peat and whose vegetation is dominated by sphagnum moss and small herbs.

Pelecypoda

Bivalves, class of **aquatic molluscs** with two shells.

Percolation

The movement of water through the subsurface soil layers, usually continuing downward to the **ground water** or **water table**, the oozing or soaking of water through the soil, the movement

of water through the openings in rock or soil, the entrance of a portion of the streamflow into the channel materials to contribute to **ground water** replenishment.

Periphyton

Organisms attached to and growing on structures, **sediments** or organisms submerged in water.

Permeability

The ability of a water bearing material to transmit water, measured by the **quantity** of water passing through a unit cross section, in a unit time, the ability of a material to allow the passage of a liquid, such as water through rocks, materials, such as gravel and sand, allow water to move quickly through them, whereas **impermeable** materials, such as clay, do not allow water to **flow** freely.

pH

The numeric value which is the negative reciprocal of the logarithm, in base 10, of the hydrogen **ion concentration** in moles per litre, a **quantitative** expression for the amount of **acidity** or **alkalinity** of a **solution**, the scale ranges from 0 to 14, where pH 7 is neutral, less than 7 is **acid**, more than 7 is **alkaline** or basic, numeric value that describes the intensity of the **acid** or basic, **alkaline**, conditions of a **solution**.

Phenol

A **benzene** ring with one of the hydrogens replaced by a hydroxyl or -OH group.

Photic zone

The upper portion of the **water column** which admits sufficient light for **photosynthesis**, the **photic** zone is reduced with increased **turbidity**.

Photosynthesis

The process by which the **chlorophyll**-bearing cells of green plants, in the presence of light, convert carbon dioxide and water into sugar, an **organic compound**, with the evolution of oxygen, incorporation of solar energy into carbon compounds by green plants, ultimately providing energy and oxygen for the vast majority of life on earth.

Phytoplankton

The **photosynthetic** portion, primarily **algae**, of the free-floating community of small, mostly microscopic, organisms in water, collectively called **plankton**.

Plankton

The total free-floating community of small, mostly microscopic, organisms in water, some are motile but all are at the mercy of water currents, (see **nekton**).

Planktonic

Drifting unattached in water, the **plankton** include both plants and animals ranging from microscopic to macroscopic.

Plume

A portion of a water body which is distinguishable from the remainder because it is not completely mixed and its characteristics are measurably different, generally downstream

from the junction of another **stream** of water from a **tributary** or **waste discharge**, the area taken up by **contaminants** in an **aquifer**.

Poikilothermic

Animals which do not automatically control their own body temperature at some fixed value, cold-blooded animals, their body temperature is controlled by **ambient** conditions or by behaviour, (see **homeothermic**).

Point source pollution

Source of **pollution** that involves **discharge** of **wastes** from an identifiable point, such as a smokestack or **sewage** treatment plant, water **pollution** coming from a single point, such as a **sewage** outflow pipe, (see **non-point source pollution**).

Pollutant

Waste material which causes harm to organisms directly or to their environment.

Pollution

Causing the release of a **pollutant** into the environment, harmful or undesirable changes in the physical, chemical, or biological characteristics of the air, water or land that may affect the health, survival or activities of human or other living organisms, degradation of the environment by a substance or condition to such a degree that the environment fails to meet specified standards or cannot be used for a specific purpose.

Polychaetes

Primarily **marine annelid worms** with paired segmental appendages, separate sexes and free-swimming **trochophore larvae**, **worms** of the Class **Polychaeta** of the **invertebrate worm** order Annelida, dominant in **marine benthos**, highly diversified, ranging from detritivores to predators, some species serving as good **indicators** of environmental stress, (see **oligochaetes**).

Polychlorinated biphenyls, PCBs

Man-made liquid chemicals that are stable, non-corroding, fire resistant, toxic and relatively non-biodegradable, once used in electrical transformers because of these properties and in paint, composed of two joined **phenol** molecules that have chlorine atoms replacing many of the hydrogen atoms, frequently found in **industrial wastes**, and subsequently in **surface water** and **ground waters**, accumulate in the environment, particularly in the **sediment** where they can remain indefinitely, virtually banned in 1979 but continuing to appear in the flesh of fish and other animals.

Polycyclic aromatic hydrocarbons, PAHs

A family of **organic compounds** with several linked **aromatic** rings in their structure which are derived from the combustion of fossil fuels, the higher molecular weight **PAHs** are an environmental concern due to their **bioaccumulation** in organisms and their **toxic** and **carcinogenic** activity.

Pond

A relatively small, sometimes ephemeral or seasonal, inland body of **fresh water** occupying a basin or hollow in the earth's surface.

Pore water

The water found in the interstices of submerged **sediments**, the basis of some types of **toxicity** testing, since it is pore water to which benthic organisms are exposed.

Porosity

A measure of the water-bearing capacity of subsurface rock, with respect to water movement, it is not just the total magnitude of porosity that is important, but the size of the voids and the extent to which they are interconnected, as the **pores** in a formation may be open and interconnected, or closed and isolated, clay may have a very high porosity with respect to potential water content, but it constitutes a poor **flow** medium as an **aquifer** because the **pores** are usually so small.

Porous

A material which allows water to pass through it, (see **nonporous**).

Potable

Water that is **toxicologically** and **pathologically** safe and **aesthetically** fit to drink, (see **non-potable**).

ppb

A **concentration** unit of chemical constituents in **solution**; the weight of **solute** per unit volume of **solvent**, usually water, one thousand micrograms per liter is equivalent to 1 **milligram per litre**, this measure is equivalent to parts per billion.

ppm

A **concentration** unit of chemical constituents in **solution**; the weight of **solute** per unit volume of **solvent**, usually water, one thousand **milligrams per liter** is equivalent to 1 gram per litre, this measure is equivalent to parts per million.

ppt

A **concentration** unit of chemical constituents in **solution**; the weight of **solute** per unit volume of **solvent**, usually applied to **marine, brackish** or **saline water**, this measure is equivalent to parts per thousand.

Precipitate

A solid or particles which have come out of an **aqueous**, or other fluid, **solution**.

Precipitation

Water, normally in the form of rain, snow and hail, which falls from the atmosphere to the earth as part of the water cycle, the process whereby solids or particle come out of **solution**.

Precision

This is an indicator of how close a series of measured values come to each other, how tight is the cluster of values, regardless of whether or not the values are accurate or reflect the actual or true value, (see **accuracy**).

Primary sewage treatment

The first stage of the **wastewater** treatment process consisting of mechanical removal of

large **settleable** solids through **filtering, screening** and/or **settling, primary sewage treatment** is a mechanical treatment in which relatively large solids are removed from the **sewage** by **settling** out as **sludge**, mechanical methods, such as **filters** and scrapers, are used to remove **pollutants**, solid material in **sewage** also **settles** out in this process, (see **secondary sewage treatment, tertiary sewage treatment**).

Primary wastewater treatment

The first stage of the **wastewater** treatment process consisting of mechanical removal of large **settleable** solids through **filtering, screening** and/or **settling, primary wastewater treatment** is a mechanical treatment in which relatively large solids are removed from the **sewage** by **settling** out as **sludge**, mechanical methods, such as **filters** and scrapers, are used to remove **pollutants**, solid material in **sewage** also **settles** out in this process, (see **secondary sewage treatment, tertiary sewage treatment**).

Pristine

Describes a natural system, water for example, that has not been affected by **anthropogenic pollution**.

Productivity

The total amount of biological material produced over a defined time period, (see **biomass, standing crop**).

Profundal zone

The deep-water region of a **lake** that is not penetrated by sunlight.

Prokaryotic

Unicellular organisms with a **bacteria**-like cell structure, lacking a nucleus and some other **eukaryotic organelles**, they may have **photosynthetic** pigments but lack **chloroplasts**, the specialized **photosynthetic organelles** in higher plants, and **mitochondria**, (see **eukaryotic**).

Protozoan

Single-celled, nucleated, **eukaryotic** organisms, lacking cell walls, generally microscopic, some are **photosynthetic**.

Q

Qualitative

Refers to what, which chemical or compound or identity regardless of how much, (see **quantitative**).

Quantitative

Refers to a measured value as how much, how fast, how deep, how many or what **concentration**, (see **qualitative**).

R

Receiving waters

A **river, ocean, stream** or other watercourse into which **wastewater** or treated **effluent** is discharged.

Recharge

Water entering an underground **aquifer** through faults, fractures or direct **absorption**, replenishing an **aquifer**.

Reclaimed wastewater

Treated **wastewater** that can be used for beneficial purposes, such as **irrigating** certain plants, **domestic wastewater** which has been treated to a **quality** suitable for a **beneficial use**.

Recycled

Using water or other materials more than once before returning it to the natural environment, **wastes** that are used for a beneficial purpose or made into new product rather than being landfilled or burned.

Recycled water

Water that is used more than once before it returns to the natural **hydrologic** system.

Red tide

Algal bloom involving **dinoflagellate phytoplankton** species, such as *Gonyaulax monilata* and *Ptychodiscus brevis*, which naturally manufacture biotoxins, can cause fish kills and several types of shellfish **poisoning** in people.

Reservoir

A natural or artificial basin for collecting and holding a supply of water, tanks, dammed areas, **lakes** or underground **aquifers**, where water is collected and used for water storage, regulation and control, large bodies of **ground water** are called **ground water reservoirs**, water behind a dam is called a surface **reservoir**.

Residence time

The period of time water is retained in a **reservoir, bay** or other system, based upon **flow** rates into and out of the system, (see **flushing**).

Residual chlorine

The unreacted chlorine which remains in **solution** after the reactions with all the **organic** compounds present have occurred.

Return flow

That part of a diverted **flow** that is not **consumptively** used and is returned to its original source or to another body of water, drainage water from **irrigated** farmlands that re-enters the water system to be used further downstream, **irrigation** water that is applied to an area and which is not consumed in **evaporation** or **transpiration** and returns to a surface **stream** or **aquifer**.

Reverse osmosis, RO

A **water treatment** method whereby water is forced through a semi-**permeable** membrane which **filters** out impurities, similar in function to a kidney dialysis machine and used in most space programs and navy vessels to turn **waste** water into **potable** water, removing **salts** from water using a membrane, the product water passes through a fine membrane that the **salts** are unable to pass through, while the **salt waste, brine** is removed, method of water or **wastewater** treatment that relies on a semi-**permeable** membrane to separate waters from **pollutants**, an external force is used to reverse the normal osmotic process resulting in the **solvent** moving from a **solution** of higher **concentration** to one of lower **concentration**.

Riparian zone

A **stream** and all the vegetation on its banks out to the high water mark, associated with the bank of a watercourse, the woodlands bordering a **river**.

River

A relatively large and usually permanent **flowing** body of **fresh water**, in a defined channel.

Runoff

Surface **flows** of water entering **rivers, lakes**, the **ocean** or **reservoirs**, **surface water** entering **rivers, fresh water lakes**, or **reservoirs**, the portion of precipitation that is not **absorbed** into the soil, but **flows** into surface **streams**, that part of the precipitation or **irrigation** water that appears in uncontrolled surface **streams, rivers**, drains or **sewers**, direct **runoff** or base **runoff**, storm interflow or **ground water runoff**, total **discharge** during a specified period of time, the depth to which a **drainage area** would be covered if all of the **runoff** for a given period of time were uniformly distributed over it.

S

Saline

Waters having **solute concentrations** approaching or exceeding that of **seawater**, slightly **saline** water — from 1,000 **ppm** to 3,000 **ppm**, moderately **saline** water — from 3,000 **ppm** to 10,000 **ppm**, highly **saline** water — from 10,000 **ppm** to 35,000 **ppm**, water containing more than 1,000 parts per million of **dissolved** solids of any type, water that contains significant amounts of **dissolved** solids, water containing **dissolved salts**, such as the **ocean**, (see **brine**, **fresh water**).

Salinity

A **quantitative** measure of the **solute concentration dissolved** in water, usually measured as parts per thousand or **ppt**, amount of **dissolved salts** in a given volume of water, **salt concentration** in **marine** waters, ranging from zero to about 33 parts per thousand, **ppt**, in **estuaries**, does not have a precise chemical definition, since the proportions of various **ions** vary in the different waters of the world.

Salmonid

Fish of the family Salmonidae which includes trout, salmon and char.

Salt

The product formed when an **acid** and a **base** react.

Saltwater

The water in the **ocean** or a **sea** which has high **salinity**.

Sample

A small portion of water or other substance taken at a given place and time for analysis; it is assumed to be representative of the whole body of water or the rest of the substance within specified statistical limits (see **grab sample**, **composite sample**).

Sanitary sewer

A system of pipes, conduits and pumps used to convey **sewage** from its source generally to a treatment plant but also to a ground disposal site, the **ocean**, **irrigation** site, holding **lagoon** or a **stream**, conveys **domestic** and institutional **sewage** and **blackwater** and **industrial wastewater**, as opposed to **stormwater**.

Saprophyte, saprophytic

Organisms that do not manufacture their own food and use the organic matter of dead, decaying or decayed other organisms as a source of nutrients for growth.

Saturation

A measure of the proportion of the maximum amount of a gas, or solid, that can be **dissolved** in a liquid, usually water, at the specified temperature and pressure, alternatively a measure of the maximum amount of water, or other liquid, that can be **absorbed** or held in a **porous** medium, the condition of a liquid when it has taken into **solution** the maximum possible **quantity** of a given substance at a given temperature and pressure.

Screening

Passing **sewage** or **wastewater** through a coarse mesh to remove the larger particles, (see **filtration**).

Sea

The large, permanent body of **salt** water surrounding the continents and covering most of the surface of the earth or one of the smaller landlocked or nearly isolated bodies of **salt** water.

Secchi disc

An opaque, black and white disk lowered into water until the demarcation between the black and white portions is no longer visible, this **secchi** depth is a practical, traditional measurement of water clarity, and is correlated with **turbidity** and the depth of the biological **photic** zone.

Secondary sewage treatment

Includes **primary sewage treatment** and provides in addition conditions conducive to the biological **oxidation** of the remaining **organic wastes**, the second step in most **waste** treatment systems, in which **bacteria** break down the **organic** parts of **sewage wastes**, usually accomplished by bringing the **sewage** and **bacteria** together in trickling **filters** or in the activated **sludge** process, involving the biological process of reducing **suspended**, **colloidal** and **dissolved organic** matter in **effluent** from **primary sewage**

treatment systems and generally removing 80 to 95 percent of the **Biochemical oxygen demand, BOD**, and **suspended matter**, accomplished by biological or chemical-physical methods, removes floating and **settleable** solids and about 90 percent of the **suspended solids**, **disinfection** is the final stage of **secondary treatment**, (see **primary sewage treatment**, **tertiary sewage treatment**).

Secondary wastewater treatment

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Sediment

Undissolved soil particles, sand and minerals washed from the land into **aquatic** systems as a result of natural and human activities, usually applied to material in **suspension** in water or recently deposited from **suspension**, all kinds of deposits from the waters of **streams, lakes** or **seas**.

Sedimentation

A large scale **water treatment** process where heavy solids **settle** to the bottom of the treatment tank by gravity after **flocculation**, the process by which solids **suspended** in water are allowed to **settle** to the bottom of a basin or container.

Sedimentation tanks

Wastewater tanks in which floating **wastes** are skimmed off and **settled** solids are removed for disposal.

Seepage

The slow movement of water through small cracks, **pores** and interstices of a material, into or out of a body of surface or subsurface water, the loss of water by **infiltration** into the soil from a canal, ditch, lateral, watercourse, **reservoir**, storage facility or other body of water, or from a field.

Separate sewer

A **sewer** system that carries only **sanitary sewage** or **stormwater runoff**, when **sewers** are constructed this way, **wastewater sewage** treatment plants do not have to be sized to handle **stormwater flows** avoiding overflows of untreated **sewage**, (see **combined sewer**).

Settleable solids

Suspended solids that will **settle** when the **sewage, wastewater** or any other water containing **suspended** material, is held static for a period of time, usually about two hours for **sewage** treatment.

Settling

Allowing **sewage** or **wastewater** to sit in a holding basin for a period of time while the larger and heavier particles **settle** to the bottom before the liquid with its **solutes** and some smaller **particulates** is sent for further treatment or directly to the environment.

Sewage

Primarily feces, kitchen **waste** and wash water but usually with other **organic** and **inorganic** materials present.

Sewage treatment

The complete **sewage** treatment process typically involves a three-phase process, in the **primary sewage treatment** process, which incorporates physical aspects, untreated water is passed through a series of **screens** to remove solid **wastes**, in the **secondary sewage treatment** process, typically involving biological and chemical processes, **screened sewage** is then passed a series of holding and **aeration** tanks and **ponds**, the **tertiary sewage treatment** process consists of **flocculation** basins, clarifiers, **filters** and chlorine basins or **ozone** or **ultraviolet radiation** processes.

Sewage treatment plant

A facility designed to receive the **wastewater** from **domestic** sources and to remove materials that damage water **quality** and threaten public health and safety when **discharged** into receiving **streams** or bodies of water, removes greases and fats, solids from human **waste** and other sources, **dissolved pollutants** from human **waste** and decomposition products, and dangerous microorganisms, facilities employ a combination of mechanical removal steps and **bacterial** decomposition to achieve these results, chlorine is often added to **discharge** from the plants to reduce the danger of spreading disease by the release of **pathogenic bacteria**.

Sewer

A system of pipes, conduits and pumps used to convey **sewage** from its source generally to a treatment plant but also to a ground disposal site, the **ocean**, **irrigation** site, holding **lagoon** or a **stream**.

Side channel

A slow moving body of water usually with two ends open to the main water body.

Site specific

Limited to the particular site or location under discussion.

Siltation

The accumulation of **sediments** transported by water, the deposition of finely divided soil and rock particles on the bottom of **stream** and **river** beds and **lakes** and **reservoirs**.

Slough

A slow moving body of water usually with one end open to the main water body.

Sludge

Solid matter that **settles** to the bottom of **sedimentation** tanks in a **sewage** treatment plant and must be disposed of by digestion or other methods or **recycled** to the land.

Solute

Any solid material that is **dissolved** in a liquid which is the **solvent**.

Solution

The mixture of **dissolved** material, the **solute** and the liquid **solvent**.

Solvent

The liquid, usually water, in which **solutes** are **dissolved**, a substance that **dissolves** other substances, thus forming a **solution**.

Sorbed

A general term for the results of the process of **absorption** and **adsorption**, often used to denote that either or both have occurred.

Sorption

A general term for the process of **absorption** and **adsorption**, often used to denote the occurrence of both.

Spatial

Of or relating to space.

Spawning

Term used to denote the process where fish, and other water dwelling organisms, deposit and **fertilize eggs** during reproduction.

Specific conductance

A **quantitative** measure of the ability of a water to conduct an electrical current, related to the type and **concentration** of **ions** in **solution** and can be used for approximating the total **dissolved solids concentration** in water, one can monitor electrical **conductivity** quickly in the field and estimate total **dissolved solids** or **TDS** without doing any lab tests at all using hand-held testers, expressed in units of electrical **conductance**, Siemens per centimeter at 25 degrees Celsius, used in **ground water** monitoring as an indicator of the presence of **ions** of chemical substances that may have been released by a leaking landfill or other **waste** storage or disposal facility.

Specific gravity

The density of a material related to that of water whose specific gravity is defined as one.

Sperm

A small motile **gamete** produced by the male organism which contains one **haploid** set of **chromosomes** and swims to the **egg** to bring about **fertilization**.

Standing crop

The total amount of biological material present at any given time, (see **productivity**, **biomass**).

Stomata

The small pores in the epidermis of plants, usually in the leaves, through which atmospheric gas and water exchange takes place and is controlled.

Storm drain

A drainage system designed for **stormwater** which is surface **runoff** from streets and other **impervious** surfaces associated with urbanization or other **anthropogenic** activities and distinct from the **sewage** system, a **sewer** that carries only surface **runoff**, street wash and snow melt from the land, **storm drains** are completely separate from those that carry **domestic** and commercial **wastewater**, (see **sanitary sewers**).

Storm sewer

A drainage system designed for **stormwater** which is surface **runoff** from streets and other **impervious** surfaces associated with urbanization or other **anthropogenic** activities and distinct from the **sewage** system, a **sewer** that carries only surface **runoff**, street wash and snow melt from the land, **storm sewers** are completely separate from those that carry **domestic** and commercial **wastewater**, (see **sanitary sewers**).

Stormwater

Water which is primarily surface **runoff** from streets and other **impervious** surfaces associated with urbanization or other **anthropogenic** activities.

Stormwater discharge

Precipitation that does not **infiltrate** into the ground due to **impervious** land surfaces, or **evaporate**, but instead **flows** onto adjacent land or water areas and/or is routed into **storm drain** or **sewer** systems.

Stratification

Vertical separation of water masses into layers with different characteristics, dense **salt** water intruding under **fresh water** in a navigation channel can establish **salinity stratification**, temperature differences in **fresh water** can form distinct water layers separated by **density**, (see **epilimnion**, **thermocline**, **hypolimnion**, **specific gravity**).

Stream

A relatively small and sometime ephemeral or seasonal **flowing** body of **fresh water**, in a defined channel.

Stream improvement

One or more works, situated in or near a stream, relating to diversion, storing, measuring, conserving, conveying, retarding, confining or using water from the stream.

Sublethal

Involves an effect that does not cause death of the organism.

Sublimation

The change of state from a solid directly to a gas, (see **evaporation**, **condensation**, **vapourization**, **transpiration**).

Supersaturation

A **concentration** of a gas in water above the equilibrium **concentration**, this occurs when the gas enters **solution** more quickly than it can be released from the liquid to gas phase as in extremely high rates of **plankton photosynthesis** or in the tail races of dams and under waterfalls where air is entrained.

Surface microlayer

The immediate surface of the water only **microns** thick, important as the interface for atmosphere and water equilibrium processes, the location of highest **concentration** of **hydrophobic pollutants** like oil, and the location of floating **marine eggs** and other biological **larval** forms.

Surface water

Water that **flows** in **streams** and **rivers** and in natural **lake** and **ponds**, in **wetlands** and in **reservoirs** constructed by humans but on the surface of the land and not underground, water on the surface on the earth, as distinguished from **ground water**.

Survey

A general overview study of a problem or area, not too specific or localized.

Suspended matter

Solids that are not in true **solution** and that can be removed by **filtration** they usually contribute directly to **turbidity**, small particles of solid **pollutants** that resist separation by conventional methods; operationally greater than 0.45 microns in size; also known as **non-filterable residue**, **suspended solids** or **suspended sediment**.

Suspended metals or substances

Metals or substances attached to **suspended solids**.

Suspended sediment

Very fine soil particles that remain in **suspension** in water for a considerable period of time due to the upward components of turbulence and currents, can be removed by **filtration** and contribute to **turbidity**.

Suspended solids

Solids that are not in true **solution** and that can be removed by **filtration** they usually contribute directly to **turbidity**, small particles of solid **pollutants** that resist separation by conventional methods; operationally greater than 0.45 microns in size; also known as **non-filterable residue**, **suspended matter** or **suspended sediment**.

Suspension

Large particles are kept from **settling** out of a liquid by gravity due to motion or agitation of the liquid, (see **solute**, **particulate**).

Swamp

A **wetland** that is permanently or seasonally submerged in shallow water and whose vegetation is dominated by shrubs and trees.

Synergism

Combined activity such that the effect is either the additive of separate effects or greater than the sum of the separate effects.

T

TDS, total dissolved solids

A **quantitative** measure of the total **dissolved organic** and **inorganic** solids **concentration** in water, an **indicator test** used for water analysis and also a measure of the mineral content of bottled water and **ground water**, one can monitor electrical **conductivity** quickly in the field and estimate total **dissolved** solids or **TDS** without doing any lab tests at all using hand-held testers since there is a relationship between **TDS** and **conductivity**, sum of all **dissolved** materials such as **salts**, which are non-filterable and remain following **evaporation** of the water, (see **specific conductance**).

Temporal

Of, or relating to, time.

Tertiary sewage treatment

A third step in **sewage** treatment usually directed towards greatly increasing the removal efficiency of **nutrients**, removal from **wastewater** of traces of **organic** chemicals and **dissolved** solids that remain after **primary sewage treatment** and **secondary sewage treatment**, selected biological, physical, and chemical separation processes to remove **organic** and **inorganic** substances that resist conventional treatment practices, consists of **flocculation** basins, clarifiers, **filters** and chlorine basins or **ozone** and **ultraviolet radiation** processes, the additional treatment of **effluent** beyond that of **primary and secondary sewage treatment** methods to obtain a very high **quality** of **effluent**.

Tertiary wastewater treatment

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Thermal pollution

An increase in air or water temperature that harms the climate or ecology of an area, a reduction in water **quality** caused by increasing its temperature, often due to disposal of **waste** heat from **industrial** or power generation processes.

Thermocline

The fairly thin zone in a **lake** that separates the upper warmer zone, **epilimnion**, from the lower colder zone, **hypolimnion**.

Tissue

A group of cells of similar structure and function which perform a specific task in an organism.

TOC, Total organic carbon

Sum of all **organic** carbon compounds in water.

Total dissolved solids, TDS

A **quantitative** measure of the total **dissolved organic** and **inorganic** solids **concentration** in water, an **indicator test** used for water analysis and also a measure of the mineral content

of bottled water and **ground water**, one can monitor electrical **conductivity** quickly in the field and estimate total **dissolved** solids or **TDS** without doing any lab tests at all using hand-held testers since there is a relationship between **TDS** and **conductivity**, sum of all **dissolved** materials such as **salts**, which are non-filterable and remain following **evaporation** of the water, (see **specific conductance**).

Total metals or substances

A **quantitative** measure of the metals or substances both in the **dissolved** state and those **sorbed** to **particulate** matter in **suspension**.

Total organic carbon, TOC

Sum of all **organic** carbon compounds in water.

Total suspended solids, TSS

The total **suspended solids** in water removable with a 0.45 micrometer mesh **filter**.

Toxic

Poisonous or harmful.

Toxicant

An element or compound with a harmful or lethal effect on the physiology, behaviour, reproduction or survival of an organism.

Toxicity

A measure of how poisonous a **toxin** is to an organism.

Toxicity test

A **bioassay** to determine the **toxicity** of a chemical or an **effluent** using living organisms, a **toxicity** test measures the degree of response of an exposed test organism to a specified **concentration** of chemical or **effluent sample**, living organisms are subjected to varying **dilutions** of **polluted** water or water containing known amounts of presumed or known **toxins** or **contaminated sediment**, mortality, declines in reproductive rates or behavioral changes indicate a **toxic** response.

Toxin

A compound or element which is **toxic** or poisonous in common usage. More strictly a **toxin** is a natural **toxicant** made by an organism as opposed to poisons manufactured by man.

Transpiration

The loss of water into the atmosphere from living plants, direct transfer of water from the leaves of living plants to the atmosphere, the passage of water vapour from a living body through membranes or **pores**, process by which water that is **absorbed** by plants, usually through the roots, is **evaporated** into the atmosphere from the plant surface, such as leaf **pores** or stomata, (see **evapotranspiration**, **vapourization**, **evaporation**.)

Tributary

A smaller **stream** which joins a larger **stream**, usually, a number of smaller tributaries merge to form a **river**.

Trihalomethanes

Chlorinated organic chemicals which are formed when water containing **organic** materials is **disinfected** with chlorine, these compounds are **toxic**.

Trochophore

Free-swimming **ciliate larvae** of **marine polychaete worms** and other **invertebrates**.

Trophic

Related to nutrition, referring to one of the hierarchical levels in the food web or **food chain** between the many producers at the bottom and the few predators at the top.

TSS, Total suspended solids

The total **suspended solids** in water removable with a 0.45 micrometer mesh **filter**.

Turbid

Coloured or opaque due to matter in **suspension**, **rivers** and **lakes** may become **turbid** after a rainfall due to **erosion** and surface **runoff** containing **particulate** matter, there is sufficient material in **suspension** that visibility is decreased.

Turbidity

The relative lack of clarity or cloudiness, of water, caused by **suspended** material, **sediments**, colored materials in **solution** and **plankton**, correlates, inversely, with available light for **photosynthesis**, the **quantity** of solid particles that are **suspended** in water and that cause light rays passing through the water to scatter, **turbidity** makes the water opaque in extreme cases, measured in **nephelometric turbidity units, NTU**.

U**µ/L, Micrograms per litre**

A **concentration** unit of chemical constituents in **solution**; the weight of **solute** per unit volume of **solvent**, usually water, one thousand **micrograms per litre** is equivalent to **1 milligram per litre**, this measure is equivalent to parts per billion or **ppb**.

Unsaturated zone

The zone immediately below the land surface where the soil **pores** contain both water and air, the soil is not totally **saturated** with water, (see **aquifer** where the **pores** are **saturated** with water).

V

Vapourization

The change of state from a liquid to a gas, the change by which any substance is converted from a liquid state and carried off as a vapor, the process of liquid water becoming water vapor from water surfaces, land surfaces and snow fields, (see **condensation**, **sublimation**, **evaporation**, **transpiration**, **evapotranspiration**).

Virus

Small non-cellular **parasitic** organisms consisting of little more than DNA, or RNA in a protein coat, often crystalline, dependent completely on the cellular machinery of their hosts to complete their life cycle and reproduce.

Volatilization

The change of state from a liquid to a gas, the change by which any substance is converted from a liquid state and carried off as a vapor, the process of liquid water becoming water vapor from water surfaces, land surfaces and snow fields, **volatilization**, (see **condensation**, **sublimation**, **vapourization**, **transpiration**, **evapotranspiration**, **evaporation**).

W

Waste

Refuse or other unwanted material.

Waste discharge

A pipe or ditch containing **wastewater** which empties into a water course.

Wastewater

Water with **waste** materials or **pollutants dissolved** in it, containing **waste** including **greywater**, **blackwater** or water **contaminated** by contact with **waste**, including process-generated and **contaminated** rainfall **runoff**, water that has been used in homes, industries and businesses that is not suitable for reuse unless it is treated.

Wastewater treatment

The complete **wastewater** treatment process typically involves a three-phase process, in the **primary wastewater treatment** process, which incorporates physical aspects, untreated water is passed through a series of **screens** to remove solid **wastes**, in the **secondary**

wastewater treatment process, typically involving biological and chemical processes, **screened wastewater** is then passed a series of holding and **aeration** tanks and **ponds**, the **tertiary wastewater treatment** process consists of **flocculation** basins, clarifiers, **filters** and chlorine basins or **ozone** and **ultraviolet radiation** processes.

Water column

The portion of an **aquatic** or **marine** environment extending from the water surface to the bottom or the surface of the **sediment**.

Water cycle

The natural pathway water follows as it changes between liquid, solid and gaseous states, biogeochemical cycle that moves and recycles water in various forms through the ecosphere, the circuit of water movement from the **oceans** to the atmosphere and to the Earth and back to the atmosphere through various stages or processes such as precipitation, interception, **runoff**, **infiltration**, **percolation**, storage, **evaporation** and transportation, (see **hydrologic cycle**).

Water pollution

Degradation of a body of water by a substance or condition to such a degree that the water fails to meet specified standards or cannot be used for a specific purpose.

Water quality

A term used to describe the chemical, physical and biological characteristics of water, usually in respect to its suitability for a particular purpose.

Water quality criteria

Scientifically derived **ambient** numerical values for physical, chemical or biological characteristics of water, **biota** or **sediment** which must not be exceeded to prevent specified detrimental effects from occurring to **water uses**, recommended **concentrations**, levels or narrative statements that should not be exceeded in order to protect the life or health of organisms.

Water quality guideline

Numerical **concentration** or narrative statement recommended to support and maintain a **designated water use**.

Water quality objective

A **water quality criterion** or **water quality guideline** adapted to protect the most sensitive **designated water use** at a specific location with an adequate degree of safety, taking local circumstances into account.

Water quality standard

Law or regulation that consists of the designated use or uses of a waterbody or a segment of a waterbody and the **water quality criteria** that are necessary to protect the use or uses of that particular waterbody.

Water table

The level below the surface of the earth at which the ground becomes **saturated** with water, the

surface of an unconfined **aquifer** which fluctuates due to seasonal precipitation, the top of the water surface in the **saturated** part of an **aquifer**.

Water treatment

A method of cleaning water for a specific purpose, such as drinking water, irrigation water or **discharge** to a **stream**.

Water use

Water that is used for a specific purpose, such as for **domestic** use, **irrigation**, or **industrial** processing, associated with human influence on the **hydrologic cycle**, includes water **withdrawal** from **surface water** and **ground water** sources, water delivery to homes and businesses, **consumptive** use of water, water released from **wastewater treatment plants**, water returned to the environment and in-stream uses, such as using water to produce hydroelectric power or for navigation.

Watershed

The land area where precipitation runs off into **streams**, **rivers**, **lakes** and **reservoirs**, a land feature that can be identified by tracing a line along the highest elevations between two areas on a map, often a ridge, large **drainage basins** contain many smaller drainage sub-basins, land area drained by a **river** or **stream**, the natural **hydrologic** unit associated with numerous ecological and physical processes involving water, the most appropriate geographic unit for management of water **quality**, (see **drainage basin**).

Well

An artificial excavation, by any method, for the purposes of withdrawing water from the underground **aquifer**, a bored, drilled, or driven shaft, or a dug hole whose depth is greater than the largest surface dimension and whose purpose is to reach underground water supplies or oil, or to store or bury fluids below ground.

Wetland

Area that is regularly wet or **flooded** and has a **water table** that stands at or above the land surface for at least part of the year, an area where **saturation** with water is the dominant influence on soil parameters and on composition of the plant community, a **bog**, **pond**, **fen**, **estuary**, **swamp**, **peatland** or **marsh**.

Whole-effluent toxicity

The aggregate **toxic** effect of an **effluent** measured directly by a **toxicity** test.

Withdrawal

Water removed from a **ground water** or **surface water** source for **anthropogenic** use.

Worm

Multicellular invertebrate organisms in several different Phyla which are soft-bodied, elongate and often **parasitic** or **pathogenic**.

Xerophytic

Refers to plants, generally, that are able to grow under very arid conditions where water is scarce, physiological and morphological adaptations to allow growth under arid conditions.

Xeroscaping

Planting vegetation that requires very little water.

Y**Yield**

A **quantitative** measure of how much water can be pumped from a **well**, for example, either in absolute units or as a percentage of what is actually present in the **aquifer**, expressed as an amount per unit of time or as an instantaneous, continuous **withdrawal** rate, the various values will differ depending upon the **recharge** rate of the **aquifer**, the increase in **biomass** or **productivity** over a season which is not necessarily reflected in the instantaneous **standing crop**.

Z**Zooplankton**

Primarily microscopic animals which swim freely in the **water column** or are carried about by water currents, many feed on **phytoplankton** and are in turn a staple diet of small fish.

Zygote

The **diploid** union of **haploid sperm** and **haploid egg**, the start of the next generation.