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# GLOSSARY OF TERMS RELATING TO WATER, SEWAGE AND INDUSTRIAL EFFLUENTS, PART I

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# *Indian Standard*

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# *Indian Standard*

# GLOSSARY OF TERMS RELATING TO WATER, SEWAGE AND INDUSTRIAL EFFLUENTS, PART I

## 0. FOREWORD

**0.1** This Indian Standard ( Part I ) was adopted by the Indian Standards Institution on 13 August 1973, after the draft finalized by the Water Sectional Committee had been approved by the Chemical Division Council.

**0.2** This part of the glossary covers terms widely used in relation to water, sewage and industrial effluents in the fields of analysis and tests; industrial and domestic applications of water; treatment of water, sewage and industrial waste; and disposal of sewage and industrial wastes after treatment. Terms relating to water supply and sewerage will be covered in subsequent parts of this standard.

**0.3** In the preparation of this standard, assistance has been taken from the following publications, and is gratefully acknowledged:

A glossary of water and sewage terms used in sanitary engineering practice. Fifth European Seminar for Sanitary Engineers. World Health Organization. 1956.

D 1129-68 Definition of terms relating to industrial water and industrial wastewaters. American Society for Testing and Materials.

BOGERT (C L), ED. Glossary — Water and sewage control engineering. 1949. American Public Health Association; American Water Works Association.

Glossary of technical terms, Part I Sewerage and sewage purification and Part II Water supply. 1971. Scottish Development Department.

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## 1. SCOPE

**1.1** This standard ( Part I ) defines the terms widely used in relation to water, sewage and industrial effluents.

## 2. TERMINOLOGY

### A

**Absorbance** — The logarithm to the base 10 of reciprocal of the relative transmittance, $T$.

$$A = \log_{10} \frac{1}{T} = -\log_{10} T$$

Absorbance thus expresses the excess absorption over that of a specified reference or standard. It is implied that compensation has been effected for reflectance losses, solvent absorption losses, and refractive effect, if present, and that attenuation by scattering is small compared with attenuation by absorption.

**Absorption** — Penetration of a liquid or gas into the body of another substance without chemical reaction.

**Acid** — A compound which dissociates in aqueous solution to furnish hydrogen ions.

**Acidity** — The quantitative capacity of aqueous media to react with hydroxyl ions.

**Acidity, Free Mineral** — The quantitative capacity of aqueous media to react with hydroxyl ions to *p*H 4·3.

**Acid Mine Drainage** — Acidic drainage from bituminous coal mines, containing a high concentration of acidic sulphates especially ferrous sulphate.

**Actinomycetes** — A type of micro-organism related to both bacteria and fungi which causes earthy and musty odours in water.

**Activated Carbon** — *See* Carbon, Activated.

**Activated Sludge Process** — A biological sewage treatment process in which a mixture of sewage and activated sludge is agitated and aerated. The activated sludge is subsequently separated from the treated sewage ( mixed liquor ) by sedimentation, and wasted or returned to the process as needed. The treated sewage overflows the weir of the settling tank in which separation from the sludge takes place.

**Adsorption** — Taking up of gases, liquids or dissolved substances on the surface of solids without chemical reaction.

**Advanced Treatment** — *See* Treatment, Advanced.

**Aeration** — Dissolution of air in a liquid by bringing about intimate contact between air and the liquid by one of the following methods: spraying the liquid in air; bubbling air through the liquid; or by

agitation of the liquid by passing through a packed tower or by cascading with the aim of transferring from the liquid phase to the gaseous phase or *vice versa.* ( *See also* Oxygenation ).

**Aeration, Diffused Air** — Aeration produced in a liquid by air passed through a diffuser.

**Aeration, Mechanical**

a) The mixing, by mechanical means, of sewage and activated sludge in the aeration tank of the activated sludge process, to bring fresh surfaces of liquid into contact with the atmosphere.

b) The introduction of atmospheric oxygen into a liquid by the mechanical action of paddle or spray mechanisms.

**Aeration Period** — The theoretical time, usually expressed in hours, that the mixed liquor is subjected to in aeration tank undergoing activated sludge treatment.

**Aeration, Surface** — The absorption of air through the surface of a liquid.

**Aerator** — A device that promotes aeration.

**Aerobic** — Thriving only in the presence of oxygen.

**Agglomeration** — The coalescence of dispersed suspended matter into larger particles or flocs which settle rapidly. Frequently used as synonym for flocculation.

**Albuminoid** — Protein and protein-like substances such as collagen and keratin.

**Algæ** — Primitive plants, uni- or multi-celled, capable of synthesizing their foodstuffs by photosynthesis.

**Algicide** — Any substance that is highly toxic to algæ.

**Alkali** — Certain soluble compounds, principally of sodium, potassium, magnesium and calcium which give rise to hydroxyl ions in solution.

**Alkalinity** — The quantitative capacity of aqueous media to react with hydrogen ions.

**Alkalinity, Bicarbonate** — Alkalinity caused by bicarbonate ions.

**Alkalinity, Carbonate** — Alkalinity caused by carbonate ions.

**Alkalinity, Caustic** — The alkalinity caused by hydroxyl ions.

**Anærobic** — Thriving in the absence of oxygen.

**Anion** — A negatively charged ion.

**Aquifer** — A water-bearing stratum of the earth.

**Available Dilution** — *See* Dilution Factor.

**Available Oxygen** — *See* Oxygen, Available.

**B**

**Back-Siphonage** — The flowing back of contaminated or polluted water from a plumbing fixture or cross-connection into a water supply line due to a lowering of pressure in the water line.

**Bacteria** — Primitive micro-organisms, generally free of pigment, which reproduce by dividing in one, two, or three planes. They occur as single cells, groups, chains, or filaments. They may be grown by special culturing out of their native habitat.

**Bacteria, Aerobic** — Bacteria which thrive only in the presence of oxygen.

**Bacteria, Anærobic** — Bacteria which thrive only in the absence of oxygen.

**Bacteria Bed** — A bed of sand, gravel, broken stone, or other media through or over which sewage or effluent flows or trickles, and depends on biological action for its effectiveness. ( *See also* Filter, Trickling ).

**Bacteria, Coli-ærogenes** — *See* Bacteria, Coliform Group.

**Bacteria, Coliform Group** — A group of bacteria, predominantly inhabitants of the intestine of man and other vertebrates but also found on vegetation, including all ærobic and facultative anærobic Gram-negative, non-spore forming bacilli that ferment lactose with gas formation. Formerly referred to as *B. coli* and bacteria of coli-ærogenes group. Their presence is indicative of fæcal pollution.

**Bacteria, Facultative** — Bacteria which can grow in the presence or absence of oxygen.

**Bacteria, Iron** — Bacteria which assimilate iron and excrete its compounds in their life processes, thereby contributing to corrosion.

**Bacteria, Non-pathogenic** — Bacteria which do not induce disease in man or the higher animals.

**Bacteria, Pathogenic** — Bacteria that produce disease.

**Bacteria Saprophytic** — Bacteria that thrive upon dead organic matter.

**Bacteria, Sulphate-Reducing** — Bacteria which assimilate oxygen from sulphate compounds thereby reducing them to sulphide.

**Bactericide** — An agent, physical or chemical, for the destruction of bacteria.

**Bacteriophage** — A viral agent that dissolves specific bacterial cells.

**Base Exchange Softener** — *See* Softener, Base Exchange.

**B. Coli** — *See* Bacteria, Coliform Group.

**Benthic Region** — The bottom of a body of water. This region supports the benthos, a type of life that not only lives upon but contributes to the character of the bottom.

**Benthos** — Aquatic bottom dwelling, organisms. These include (a) sessile animals, such as sponges, barnacles, mussels, oysters, some of the worms, and many attached algae; (b) creeping forms, such as insects, snails, and certain clams; and (c) burrowing forms which include most clams and worms.

**Berkfeld Filter** — *See* Filter, Berkfeld.

**Beta Energy, Maximum** — The maximum energy of the beta-particle energy spectrum produced during beta decay of a given radioactive species.

NOTE — Since a given beta-particle emitter may decay to several different quantum states of the product nucleus, more than one maximum energy may be listed for a given species.

**Bioassay** — A determination of the concentration of a given material by comparison with a standard preparation; or the determination of the quantity necessary to affect a test animal under stated laboratory conditions.

**Biochemical** — Resulting from biological growth of activity, and measured by or expressed in terms of the ensuing chemical change.

**Biochemical Oxygen Demand (BOD)** — The quantity of oxygen required for the oxidation of organic matter by bacterial action in the presence of oxygen. It is a measure of the strength of organic matter in terms of its ability to deplete oxygen in water. Generally, the standard test consists in measuring the oxygen depletion at 20°C for 5 days.

**Biochemical Process** — *See* Biological Process.

**Biological Process** — The process by which the life activities of bacteria and other micro-organisms in search for food, break down complex organic materials into simple, more stable substances. Self-purification of sewage, polluted streams, sludge digestion, and so-called secondary sewage treatments result from this process. Also called ' biochemical process '.

**Biological Tests** — Examination for the purpose of determining the presence, identity, numbers, or effects of the presence of any organism in industrial water.

**Bleed-Off**

a) To drain a liquid or gas, or to bleed accumulated air from a water line or to drain a tap or a container of accumulated water.

b) The exuding, percolation or seeping of a liquid through a surface.

**Bloom, Lake** — Large masses of microscopic and macroscopic plant life, such as green algae, occurring in bodies of water.

**Blowdown** — Draining off a portion of the contents of a boiler with a view to reduce the concentration of total solids in the boiler.

**Boiler Water** — Water present in a boiler when steaming is, or has been taking place. ( *See* Industrial Water. )

**Broad Irrigation** — *See* Irrigation, Broad.

**Buffer** — A substance which tends to resist changes in *p*H of a solution.

**Buffer Action** — The action of certain substances in resisting a change in hydrogen ion concentration.

## C

**Carbon, Activated** — Carbon particles usually obtained by carbonization of cellulosic material in the absence of air and possessing a high adsorptive capacity. Commonly used for the removal of colour, taste or odour in water.

**Carbonate Hardness** — The hardness in water caused by bicarbonates and carbonates of calcium and magnesium.

**Carrier** — A person who, though showing no clinical signs of a disease, carries ( and disseminates ) large quantities of pathogenic organisms.

**Carry Over** — Entrainment of liquid or solid particles from the boiling liquid in the evolved vapour; also the particles so entrained.

**Cascade**

a) A stretch of stream, intermediate between a rapids and a waterfall, where the drop in elevation of the stream bed is considerable but not sufficient to cause the water to fall vertically.

b) A sudden drop installed in a water way to produce agitation and aeration of the liquid flowing over.

**Cation** — A positively charged ion.

**Cation Exchange Material** — An ion-exchange material capable of reversible exchange of positively charged ions.

**Caustic Embrittlement** — *See* Embrittlement Cracking.

**Cesspool** — An underground impervious pit into which raw household sewage or other untreated liquid waste is discharged for temporary storage and from which the contents are removed for final disposal.

**Chelating Agent** — Chemical compounds which have the property of withdrawing ions from solution to form closed ring soluble complexes.

**Chemical Oxygen Demand ( COD )** — The amount of oxygen, expressed in mg per litre, consumed under specified conditions in the oxidation of the organic and oxidizable inorganic matter contained in an industrial waste water, corrected for the influence of chlorides.

**Chlorination** — The application of chlorine to water, sewage, or industrial wastes, generally for the purpose of disinfection, but frequently for accomplishing other biological or chemical results.

**Chlorination, Break-Point** — The application of chlorine to water, sewage, or industrial wastes containing free ammonia to the point at which free residual chlorine is a minimum.

**Chlorine, Combined Available Residual** — That portion of the total residual chlorine remaining in water, sewage, or industrial wastes at the end of a specified contact period, which will react chemically and biologically as chloramines or organic chloramines.

**Chlorine Demand** — The difference between the amount of chlorine added to water, sewage, or industrial wastes and the amount of residual chlorine remaining at the end of a specified contact period. The demand for any given water varies with the amount of chlorine applied, time of contact, and temperature.

**Chlorine, Free Available Residual** — That portion of the total residual chlorine remaining in water, sewage or industrial wastes at the end of a specified contact period, which will react chemically and biologically as hypochlorous acid or hypochlorite ion.

**Chlorine Requirement** — *See* Chlorine, Residual.

**Chlorine, Residual** — The total amount of chlorine ( combined and free available chlorine ) remaining in water, sewage or industrial wastes at the end of a specified contact period following chlorination.

**Clarifier** — A tank or basin in which water, sewage, or other liquids containing settleable solids, is retained for a sufficient time, and in which

the velocity of flow is sufficiently low, to remove by gravity a part of the suspended matter. Circular sedimentation tanks are also known as clarifiers.

**Clean River** — *See* River, Clean.

**Coagulant** — A material which removes colloidal substances present in water, sewage, etc, in the form of precipitates comprising floc particles more or less gelatinous in character.

**Coagulation**

a) The process of converting colloidal or finely divided suspended matter into particles of such sizes as can be settled reasonably rapidly by the addition of an appropriate chemical coagulant, by biological processes or by other means.

b) The process of adding a coagulant and necessary other reacting chemicals.

**Colloids** — Finely divided solids ( particle size varying from $10^{-5}$ to $10^{-7}$ cm ) which will not settle but may be removed by coagulation or biochemical action.

**Composting** — The biological breakdown of organic solids to stabilize them, producing a humic substance valuable as a fertilizer base.

**Condensate** — Water obtained by evaporation and subsequent condensation of steam; usually water of high purity, unmixed with any other water.

**Condenser** — An apparatus for removing heat from a vapour ( steam ) so as to cause it to revert to the liquid state ( water ).

**Conditioning** — Treatment of water exclusive of disinfection to produce a water free of taste, odours, and other undesirable qualities. The term is more specially used for the treatment of boiler feed water.

**Contact Period** — The time allowed for a sterilizing agent to act on the water under treatment before the water is fed to supply. Occasionally the term is also used for any other reaction period.

**Contamination** — A general term signifying the introduction into water of micro-organisms, chemicals, wastes. or sewage, which renders the water unfit for its intended use.

**Cooling Coil** — A coil of pipe or tubing to contain a flowing stream of hot liquid which is cooled by heat transfer to a cold liquid outside.

**Cooling Water** — Water used for cooling, mainly for steam condensers or internal combustion engines.

**Corrosion** — Chemical attack, as of metals, by which the metal is converted to a compound and thus deteriorated.

**Counter Background** — In the measurement of radioactivity, the counting rate resulting from factors other than the radioactivity of the sample and reagents used.

NOTE — Counter background varies with the location, shielding of the detector, and the electronics: it includes cosmic rays, contaminating radioactivity, and electrical noise.

**Counter Beta-Particle Efficiency** — In the measurement of radioactivity, that fraction of beta particles emitted by a source which is detected by the counter.

**Counter Efficiency** — In the measurement of radioactivity, that fraction of the disintegrations occurring in a source which is detected by the counter.

**Counter, Proportional** — An instrument whose response to radiation is based upon the collection of the ions formed by the interaction of the radiation with the counter materials, plus a proportionate number of secondary ions formed by gas amplification.

**Count, Standard Plate** — Number of colonies of bacteria grown on selected solid media at a given temperature and incubation period, usually expressed as number of bacteria per millilitre of sample.

**Critical Concentration Range** — In bioassay, the interval between the highest concentration at which all test animals survive for 48 hours and the lowest concentration at which all test animals die within 24 hours.

**Crustaceæ** — Mostly aquatic animals having rigid outer coverings, jointed appendages and gills. Examples are crayfish, crabs, barnacles, water fleas and sow bugs.

**Culture** — Any organic life which has been intentionally developed by use of suitable food and environment.

**Culture Medium** — A nutrient medium for the growth of organic life for study.

**Curie** — A unit of radioactivity equivalent to $3{\cdot}700 \times 10^{10}$ atomic disintegrations per second or $2{\cdot}220 \times 10^{12}$ atomic disintegrations per minute. A microcurie is one millionth of a curie ( $10^{-6}$ curie ); a picocurie, one-millionth of a microcurie ( $10^{-12}$ curie ).

## D

**Deæration** — The process of removing air from a liquid in which it is dissolved, usually for control of corrosion.

**Dechlorination** — The partial or complete reduction of residual chlorine in a liquid by any chemical or physical process.

**Deferrization** — The removal, usually with the aid of aeration, of iron from water.

**Defluoridation** — Removal of fluorides from water.

**Demineralization** — Complete removal of anions and cations from water, usually by the use of ion-exchange materials.

**Deoxygenation** — The depletion of the dissolved oxygen in a liquid. Under natural conditions, associated with the biochemical oxidation of organic matter present.

**Dephenolation** — The removal of phenols from gas liquor and other similar waste waters.

**Desalination** — A means of obtaining potable water from sea water, employed mainly in arid parts of the world and by some ships.

**Detention Period** — The theoretical time required to displace the contents of a tank or unit at a given rate of discharge ( volume divided by rate of discharge ).

**Detritus** — The heavier solid matter in sewage, usually mainly inorganic.

**Diatom** — Microscopic unicellular or colonial algæ constituting the class Bacillarieæ and having silicified cell walls. They are of great importance in self-purification of natural waters and as food for many other forms of aquatic life.

**Diffuser** — A porous or perforated plate or tube through which air is forced and divided into minute bubbles for diffusion in liquids. Commonly made of carborundum, alundum, silica sand, PVC or nylon.

**Digestion** — The anærobic decomposition of organic matter, resulting in partial gasification, liquefaction and mineralization.

**Dilution**

a) An operation of disposing of sewage, industrial waste, or sewage treatment plant effluent by discharging it into a stream or body of water.

b) The ratio of volume of flow of a receiving stream to the total volume of sewage or sewage treatment plant effluent or industrial effluent discharged into it.

**Dilution Factor** — The ratio, usually expressed in percentage, of the quantity of untreated sewage or partly or completely treated effluent, to

the average quantity of diluting water available effectively at the point of disposal or at any point under consideration. The factor is sometimes taken as the reciprocal. Also called 'available dilution'.

**Discharge**

a) As applied to a stream, the rate of flow, or volume of water flowing at a given place and within a given period of time.

b) The act involved in water or other liquid passing through an opening or along a conduit or channel.

c) The water or other liquid which emerges from an opening or passes along a conduit or channel.

**Disease, Water-Borne** — A disease caused by organisms or toxic substances which are carried and thus propagated by water. The most common water-borne diseases are hepatitis, typhoid, cholera, dysentery, and other such intestinal disturbances.

**Disinfection** — The killing of the larger portion ( but not necessarily all) of the harmful and objectionable micro-organisms in, or on, a medium by means of chemicals, heat, etc.

**Dissolved Matter** — That matter, exclusive of gases, which is dispersed in water to give a single phase of homogeneous liquid.

**Dissolved Oxygen** — *See* Oxygen, Dissolved.

**Dissolved Solids** — *See* Solids, Dissolved.

**Domestic Use of Water** — *See* Use of Water, Domestic.

## E

*E. coli* — *See Escherichia coli.*

**Effluent**

a) A liquid which flows out of a containing space.

b) Sewage, water or other liquid, partially or completely treated, or in its natural state, as the case may be, flowing out of a reservoir, basin, or treatment plant or part thereof.

**Electrical Conductivity** — The reciprocal of the resistance in ohms measured between opposite faces of a centimetre cube of an aqueous solution at a specified temperature.

NOTE — The electrical conductivity shall be expressed in micromhos per centimetre at $t$°C. The actual resistance, $R$, of the cell is measured in ohms. The conductance, $1/R$ is directly proportional to the cross-sectional area, $A$, inversely proportional to the length of the path, $L$, and directly proportional to the constant, $K$. The latter

is the conductivity measured between opposite faces of a centimetre cube. Mathematically,

$$\frac{1}{R} = \frac{KA}{L}, \text{ or } K = \frac{L}{AR} = \frac{\text{cm}}{\text{cm}^2 \times \text{ohms}} = \text{mhos per cm.}$$

The numerical value of this expression multiplied by 1 000 000 is the electrical conductivity in micromhos per centimetre.

**Elutriation of Sludge** — A process of washing of sludge with water either mechanically or with diffused air.

**Embrittlement Cracking** — A form of metal failure that occurs in steam boilers at riveted joints and at tube ends, the cracking being predominantly intercrystalline.

NOTE — This form of cracking, which has been known as 'caustic embrittlement' is believed to result from the action of certain constituents of concentrated boiler water upon steel under stress.

**Entrainment** — The carrying over of drops of liquid from an evaporator or boiler due to the vapour velocity being greater than the rate of settling of the drops.

**Equalizing Basin** — A holding basin in which, by retention, variation in flow and composition of a liquid are averaged out.

***Escherichia coli*** **(*E. coli*)** — A species of genus Escherichia bacteria, normal inhabitant of the intestine of man and all vertebrates. This species is classified among the coliform group. *See* Bacteria, Coliform Group.

**Estuary** — Commonly, an arm of the sea at the lower end of a river. Estuaries are often enclosed by land except at channel entrance point.

**Eutrophication** — The enrichment of water in streams by substances contained in effluents or in the run-off from agricultural land, especially phosphorus and nitrogen compounds. It can greatly accelerate the growth of plant and other life, causing depletion of oxygen and danger to fish.

## F

**Filamentous** — Having the shape of a fine thread-like body or structure.

**Film, Microbial** — The gelatinous film of zoogloeal growths covering the media or spanning the interstices of a biological bed.

**Filter** — A device or structure for removing solids from water, sewage or other liquids. The liquid is passed through a filtering medium which may consist of a granular material such as sand, infusorial or diatomaceous earth, anthracite, etc, finely woven cloth, unglazed porcelain, or even specially prepared paper.

**Filter, Berkfeld** — A household apparatus for filtering water through a diatemacious earth called kieselguhr.

**Filter Medium** — The material with which a filter is filled, for example, sand, paper, cloth, etc.

**Filter, Percolating** — *See* Filter, Trickling.

**Filter, Rapid Sand** — A filter made up of sand, gravel, authracite, etc, through which water is passed during treatment. It may be either of the gravity type open to the atmosphere, or of the pressure type. Unlike a slow sand filter, it is capable of being back washed. The solids are removed mainly by mechanical action which may be assisted by a chemical floc.

**Filter Run** — The period of working of a sand filter between two successive cleaning or washing operations.

**Filter, Sedgewick-Rafter** — A cylindrical funnel used as a filter for the concentration of organisms in the Sedgewick-Rafter method for the quantitative determination of microscopic organisms, that is, of a size larger than bacteria, in water.

**Filter, Slow Sand** — A filter in which water is passed slowly downwards, through a layer of fine sand or other suitable material, and in which mechanical removal of solids is assisted by biological action. The filter is cleaned by skimming a thin layer from the upper surface.

**Filter, Trickling** — A filter consisting of an artificial bed of coarse materials, such as broken stone, clinkers, slate, or other materials, over which the effluent is distributed and applied in drops, films, or spray, from troughs, drippers, moving distributors, or fixed nozzles, and through which it trickles to the underdrains, giving opportunity for the formation of biological films, which clarify and oxidize the effluent. These are also sometimes called percolating filters.

**Filtration** — The process of passing a liquid through a filtering medium ( which may consist of granular material such as sand, magnetite, or diatomaceous earth, finely woven cloth, unglazed porcelain, or specially prepared paper ) for the removal of suspended or colloidal matter usually of a type that cannot be removed by sedimentation.

**Fixed Matter** — Residues remaining after ignition of particulate or dissolved matter or both.

**Floc** — Small gelatinous masses, formed in a liquid by the addition of coagulants or through biochemical processes or by aggregation of microscopic and ultramicroscopic particles.

**Flocculation** — A process, mechanical or chemical or both, by which small particles of solids in a liquid are aggregated into larger masses, thus making it easier for the removal of solids by sedimentation.

**Flotation** — The process of raising of suspended solids to the surface of a tank by use of air, gas evolution, bacterial decomposition, heat or chemicals.

**Fluorescence** — The absorption of radiation at one wavelength or range of wavelengths and its re-emission as radiation of longer, visible wavelengths.

**Fluoridation** — The addition of suitable fluorides to public water supplies, usually for the prevention of dental caries.

## G

**Gas, Sewage** — The gas produced during the digestion of sewage sludge. Also called sludge digestion gas.

**Grease** — It includes fats, waxes, free fatty acids, calcium and magnesium soaps, mineral oils, and other non-fatty materials. The type of solvents used for its extraction should be stated.

**Grit** — Inorganic solids in sewage or effluents.

**Grit Chamber** — Basin in which grit is removed from the sewage or effluents.

**Grit Channel** — A channel through which grit-bearing effluent or sewage is allowed to flow to remove the grit.

**Ground Water** — *See* Water, Ground.

## H

**Half Life** — The period of time in which one half of the radioactive atoms of a given radionuclide decay; an unvarying characteristic of a radionuclide.

**Hardness** — That property of water, due mainly to the bicarbonates, chlorides and sulphates of calcium and magnesium, which prevents the production of abundant lather with soap.

NOTE — Originally hardness was understood to be the capacity of a water for precipitating soap. Soap is precipitated chiefly by calcium and magnesium ions commonly present in industrial water but may also be precipitated by ions of other polyvalent metals such as iron, manganese and aluminium, and by hydrogen ions. It is commonly expressed in terms of the equivalent amount of calcium carbonate.

**Hardness, Carbonate** — *See* Carbonate Hardness.

**Hardness, Non-carbonate** — *See* Non-carbonate Hardness

**Hardness, Total** — The sum of carbonate hardness and non-carbonate hardness.

**Humus** — A well stabilized sludge obtained in a sewage and waste water treatment plant similar in appearance to the dark or black carboniferous residue in the soil resulting from the decomposition of vegetable tissues of plants originally growing therein. The term is also applied to the sludge from secondary settling tanks in a trickling filter plant.

**Humus Tank** — *See* Tank, Humus.

**Hydrogen Cycle** — The operation of cation exchange cycle wherein the removal of specified cations from the influent water is accomplished by exchange with an equivalent amount of hydrogen ion from the exchange material.

## I

**Imhoff Tank** — *See* Tank, Imhoff.

**Incubation** — Maintenance of viable organisms in nutrient medium at constant temperature for controlled growth or reproduction.

**Index, Pollutional** — A criterion by which the degree of pollution in a stream, as indicated by bacterial count, plankton, biochemical oxygen demand, or quantity of dissolved oxygen, may be measured.

**Index, Sludge Volume ( SVI )** — The volume in millilitres occupied by aerated mixed liquor containing one gram of dry solids after settling for 30 minutes, commonly referred to as the Mohlman index.

**Indicator** — Substance which gives a visible change, usually of colour, at a desired point in a chemical reaction.

**Industrial Use of Water** — *See* Use of Water, Industrial.

**Industrial Waste Water** — Water discharged from an industrial process as a result of formation or utilization in that process.

NOTE — Industrial waste water may have been utilized directly or indirectly, such as cooling water. Industrial waste water may be discharged into other processes, recovery systems, natural streams, or other receiving bodies.

**Industrial Water** — Water ( including its impurities ) used directly or indirectly in industrial processes.

**Influent** — Sewage, water, or other liquid, raw or partly treated, flowing into a reservoir, basin, or treatment plant, or part thereof.

**Inhibitory Toxicity** — Any direct inhibitory action of pollutants on the rate of reproduction of diatoms which is demonstrable within 7 days or less of testing.

**Inoculate** — To introduce a small amount of substance into a solution for observation of its effect such as organic growth or crystal formation.

**Insecticide** — An agent, chemical or otherwise, for the control or destruction of insects, mainly used in agricultural operations.

**Ion** — An atom or radical in solution carrying an integral electrical charge either positive ( cation ) or negative ( anion ).

**Ion-Exchange** — A process by which certain ions of given charges may be absorbed from solution and replaced into the solution by other ions of similar charge from the absorbent.

**Ion-Exchange Material** — An insoluble solid that has the ability to exchange reversibly certain ions in its structure, or attached to its surface as functional groups, with ions in a surrounding medium.

**Irrigation** — The artificial application of water to land for agricultural purposes. The application of sewage is termed ' broad irrigation '.

**Irrigation, Broad** — The irrigation of crops with sewage. It differs from sewage farming in that sewage disposal is the primary object of broad irrigation, with the raising of crops being incidental, while the reverse is true of sewage farming.

**Irrigation Water** — *See* Water, Irrigation.

## J

**Jackson Candle Turbidity** — An empirical measure of turbidity in special apparatus, based on the measurement of the depth of a column of water sample that is just sufficient to extinguish the image of a burning standard candle observed vertically through the sample.

## L

**Lagoon** — A large shallow pond for the treatment of liquid wastes; frequently it does not have a water-tight bottom.

**Lagoon, Sludge** — A relatively shallow basin or a natural depression, used for the storage or digestion of sludge, and sometimes for its ultimate detention or dewatering.

**Langelier's Index** — An expression to indicate the hydrogen-ion concentration that a water should have, to be in equilibrium with its content of calcium carbonate.

**Liquor, Mixed** — A mixture of activated sludge and sewage in the æration tank.

**Loading, BOD** — *See* Loading, Trickling Filter.

**Loading, Trickling, Filter**

a) *Organic* — The kilograms of BOD on any other parameter for organic matter in the applied liquor per $m^3$ of filter bed volume per day.

b) *Hydraulic* — The volume in $m^3$ of waste per hectare of filter bed per day.

## M

**Median Inhibitory Limit ( $IL_m$ )** — The concentration of test material which decreases the amount of growth to 50 percent of that in the control within a test period of 7 days. It is the recommended measure or index of relative toxicity. Specifically, it is a concentration value derived by graphical interpolation and is based on the amount of growth made in 7 days in the test flasks as compared with that made in a control.

**Median Lethal Dose ( $LD_{50}$ )** — The minimum amount of the test material lethal to 50 percent of a group of test organisms for a specified period.

**Median Tolerance Limit ( $TL_m$ )** — The concentration of the test material in a suitable diluent (experimental water) at which just 50 percent of the test animals are able to survive for a specified period of exposure.

**Metabolism** — The process by which food is used and wastes are formed in living matter.

**Microbial Film** — *See* Film, Microbial.

**Microbiological** — Pertaining to very small living matter and its processes.

**Micro-organism** — Minute organism, either plant or animal, invisible or barely visible to the naked eye.

**Microscopic** — Minute, very small; pertaining to a microscope.

**Mixed Bed** — A physical mixture of anion exchange material and cation exchange material.

**Mixed Liquor** — *See* Liquor, Mixed.

**Most Probable Number ( MPN )** — In the testing of bacterial density by the dilution method, that number of organisms per unit volume which, in accordance with statistical theory, would be more likely than any other possible number to yield the observed test result or which would yield the observed test result with the greatest frequency. Expressed as density of organisms per 100 ml.

**Moulds** — Filamentous fungi composed of many cells.

**Municipal Use of Water** — *See* Use of Water, Municipal.

## N

**Nephelometry** — Measurement of the turbidity in liquids by the scattering of light.

**Nitrogen, Organic** — Nitrogen combined in organic molecules such as proteins, amines, and amino acids.

**Non-carbonate Hardness** — Hardness in water caused by chlorides, sulphates, and nitrates of calcium and magnesium.

## O

**Odour Intensity Index** — The number of times the concentration of the original sample is halved by addition of odour-free water to obtain the least definitely perceptible odour.

**Odour, Threshold Number** — The greatest dilution of the sample with odour-free water to yield the least definitely perceptible odour.

**Oily Matter** — Hydrocarbons, hydrocarbon derivatives, and all liquid or unctuous substances that have boiling points of 90°C or above and are extractable from water at *p*H 5·0 or lower, using benzene as a solvent.

**Organisms, Microscopic** — Plants or animals microscopic in size or slightly larger, which do not require special culture and are easily studied with the microscope.

**Outfall** — The point or location where sewage or drainage discharges from a sewer, drain or conduit.

**Oxidation Pond** — A pond, natural or artificial, into which partly treated sewage is discharged and in which natural purification processes take place under the influence of sunlight and air.

**Oxidation Process** — Any method of sewage or industrial effluent treatment for the oxidation of the putrescible organic matter; the usual methods are biological filtration and the activated sludge process.

**Oxygen Absorbed** — The quantity of oxygen taken up from potassium permanganate in solution by a liquid containing organic matter. Commonly regarded as an index of the organic matter. Time and temperature must be specified.

**Oxygenation** — Dissolution of oxygen in a liquid by bringing about intimate contact between the liquid and oxygen gas. ( *See* Aeration ).

**Oxygen, Available** — The quantity of atmospheric oxygen dissolved in the water of a stream. It is the quantity of dissolved oxygen available for the oxidation of organic matter in sewage.

**Oxygen Deficiency** — The additional quantity of oxygen required to satisfy the biochemical oxygen demand in a given liquid, usually expressed in mg/l.

**Oxygen Demand** — Oxygen required for oxidation of inorganic matter, or for stabilization of decomposable organic matter by ærobic bacterial action.

**Oxygen, Dissolved ( DO )** — The oxygen dissolved in sewage, water or other liquid usually expressed in mg/l or percent of saturation.

**Oxygen, Residual** — The dissolved oxygen content of a stream after deoxygenation has begun.

**Oxygen Saturation Capacity** — The maximum quantity of dissolved oxygen that a liquid exposed to the atmosphere can contain at a given temperature and pressure.

## P

**Particulate Matter** — That matter, exclusive of gases, existing in the non-liquid state, which is dispersed in water to give a heterogeneous mixture.

**Part Per Million ( ppm )** — A measure of proportion by weight and equivalent to a unit weight of solute per million unit weights of solution.

NOTE — A part per million is generally considered equivalent to a milligram per litre, but this is not precise. A part per million is equivalent to a milligram of solute per kilogram of solution.

**Pathogenic** — Causing disease.

**Pathogens** — Pathogenic or disease-producing organisms.

***p*H** — The *p*H value of an aqueous solution is the logarithm of the reciprocal of the hydrogen ion concentration ( expressed in g/l ) of the solution.

**Phenolic Compounds** — Hydroxybenzene and its derivatives.

**Pitting** — Localized corrosion

**Plankton** — Plant or animal micro-organisms, discrete and free-floating, having relatively small power of locomotion, or which drift in the water by wind or wave-action. ( *See* Organisms, Microscopic ).

**Polishing** — An advanced stage of treatment used where a specially high quality of effluent is necessary.

**Polluted Water** — *See* Water, Polluted.

**Pollution** — Alteration of the physical, chemical or biological properties of water, or discharge of any sewage or industrial waste or of any liquid, gaseous or solid substances into water as may, or is likely to, create nuisance or render such water harmful or injurious to public health or safety, or to domestic, commercial, industrial, agricultural or other legitimate uses, or to animal life and health.

**Pollutional Load** — An expression of the quantity of the pollutants present in a waste water discharged into a receiving water, commonly expressed on the basis of BOD.

**Population Equivalent** — The calculated population expressed on the basis of BOD which would contribute the same amount of pollutants per day as the waste.

**Post-Chlorination** — The application of chlorine to water, sewage or industrial wastes subsequent to any treatment, including pre-chlorination. The term refers only to a point of application.

**Potable Water** — *See* Water, Potable.

**Pre-æration** — A preparatory treatment of water or sewage comprising æration to remove gases, add oxygen, or promote flotation of grease, and aid coagulation.

**Pre-chlorination**

a) Chlorination of water prior to filtration.

b) Chlorination of sewage prior to treatment.

**Pre-treatment**

a) Any treatment of waste water before it is introduced into a waste water system or before primary treatment.

b) In water treatment, any treatment given before filtration.

**Primary Treatment** — *See* Treatment, Primary

**Priming**

a) A carry over of water with a sudden generation of steam, like the bumping which sometimes occurs when water is boiled in an open vessel.

b) The action of starting the flow in a pump or siphon by first filling it with water.

**Protozoa** — Microscopic, one-celled animals.

## Q

**Quality, Water** — *See* Water Quality.

## R

**Radioactivity** — Spontaneous nuclear disintegration with emission of particulate or electromagnetic radiations.

**Re-æration** — The absorption of oxygen by a liquid the dissolved content of which has been depleted.

**Reagent Background** — In the measurement of radioactivity of water samples, the counting rate observed when a sample is replaced by mock sample salts or by reagent chemicals used for chemical separations.

NOTE — Reagent background varies with the reagent chemicals and analytical methods used and may vary with reagents from different manufacturers and from different processing lots.

**Recarbonation** — The treatment of water softened by means of excess lime, with carbon dioxide or sodium bicarbonate to redissolve the excess lime and to prevent the water having plumbo-solvency.

**Recirculation** — The return of effluent to the incoming flow to:

a) reduce its strength,

b) provide acclimatized seed,

c) freshen the incoming waste water,

d) maintain a high rate of loading, and

e) maintain the required hydraulic loading.

**Regeneration** — That part of the operating cycle of an ion-exchange process in which a specific chemical solution is passed through the ion-exchange bed to prepare it for a service run.

**Relative Density ( Specific Gravity )** — The ratio of the weight in air of a given volume of the sample to the weight in air of an equal volume of reagent water, both being determined at the standard reference temperature.

**Reservoir, Impounded** — A reservoir wherein surface water is retained for a considerable period of time, ranging from several months upward, and released for use at a time when the ordinary flow of the stream is insufficient to satisfy requirements.

**Residual Oxygen** — *See* Oxygen, Residual.

**Riparian** — Of, pertaining to, or situated, or dwelling on the bank of a river or other body of water.

**Riparian Rights** — The legal right which assures to the owner of land abutting upon a stream or other natural body of water the use of such water. It allows each riparian owner to require the waters of a stream to reach his land undiminished in quantity and unaffected in quality except for minor domestic uses. In general, it allows each riparian owner to make a reasonable use of the water upon his riparian land, the extent of such use being governed by the reasonable needs and requirements of other riparian owners and the quantity of water available.

**River** — A larger stream of water which serves as the natural drainage channel for a drainage basin of considerable area. The term is a comparative one as to size; a stream termed 'river' in the arid section of the country would hardly be designated a 'creek' in the humid section.

**River, Clean** — A river that gives no sensible evidence of pollution and from which wholesome drinking water can be obtained by practicable methods of water purification.

**Rotifers** — Minute, many-celled aquatic animals, free or attached, which are characterized by rotating movement of the head.

## S

**Salinity** — The amount of salts ( especially sodium chloride ) in a water.

**Saprophytic Organism** — Any organism living on dead or decaying matter.

**Scale** — A deposit formed from solution directly in place upon a confining surface.

NOTE — Scale is a deposit that will usually retain its physical shape when mechanical means are used to remove it from the surface on which it is deposited. Scale, which may or may not adhere to the underlying surface, is usually crystalline and dense, frequently laminated, and occasionally columnar in structure.

**Scale, Boiler** — An incrustation varying from a porous, friable crust to a dense very hard coating deposited on boiler heating surfaces due to precipitation of minerals out of solution from the water used.

**Scintillation** — The production of light photons by the interaction of radiation with a suitable material.

**Screen** — A device with openings, generally of uniform size, used to retain or remove suspended or floating solids in flowing water or sewage, and to prevent them from entering an intake or passing a given point in a conduit. The screening element may consist of parallel bars, rods, wires, grating, wire mesh, or perforated plate, and the openings may be of any shape, although they are generally circular or rectangular. The device may also be used to segregate granular material, such as sand, crushed rock and soil into various sizes.

**Scum** — The lighter solids which float to the top of water or sewage.

**Secondary Treatment** — *See* Treatment, Secondary.

**Sedgewick-Rafter Filter** — *See* Filter, Sedgewick-Rafter.

**Sediment**

a) Any material carried in suspension by water, which will ultimately settle to the bottom after the water loses velocity.

b) Fine water-borne matter deposited or accumulated in beds.

**Sedimentation** — Gravitational settling of solid particles in a liquid system.

**Seeding, Sludge** — The inoculation of undigested sewage solids with sludge that has undergone decomposition, for the purpose of introducing favourable organisms, thereby accelerating the initial stage of digestion.

**Seepage Pit** — A covered pit designed to permit liquid wastes to seep into the surrounding soil.

**Self-Absorption** — The absorption of radiation particles or photons in the source itself.

**Self-Purification** — The natural processes of purification of pollution in a moving or still body of water whereby the bacterial content is reduced, the BOD is largely satisfied, the organic content is stabilized, and the dissolved oxygen returned to normal.

**Septicization** — A term applied to anærobic decomposition whereby intensive growths of bacteria with the enzymes secreted by them liquefy and gasify solid organic matter.

**Septic Tank** — *See* Tank, Septic.

**Sequester** — To form a stable, water-soluble complex.

**Settling Basin** — Reservoir receiving water after chemical mixing to permit settling of the floc.

**Sewage** — Largely the water supply of a community after it has been fouled by various uses. From the standpoint of source it may be a combination of the liquid or water-carried wastes from residences, business buildings, and institutions, together with those from industrial establishments, and with such ground water, surface water, storm and water as may be present.

**Sewage Farming** — The raising of crops where sewage is applied to the land for irrigation and fertilization purposes.

**Sewage Gas** — *See* Gas, Sewage.

**Sewer** — A pipe or conduit, generally closed, but normally not flowing full, for carrying sewage and other waste liquids.

**Sewerage** — A system of sewers constructed to convey sewage.

**Sewer, Public** — A common sewer controlled by public authority.

**Shock Load** — A sudden load or change in waste concentration which produces an adverse effect on the micro-organisms in the treatment unit.

**Skimming** — The removal of scum from the surface of a body of liquid.

**Slick** — A film of oil on a water surface or in the case of sewage discharged to the sea, the area of discoloration visible on the surface.

**Slimes** — Substances of gelatinous nature, frequently derived from microbiological growth, found on the inner surface of a conduit, on a filter medium or elsewhere.

**Sludge** — A water-formed sedimentary deposit, usually in a very wet condition. It may include all suspended solids carried by the water. Sludge usually does not cohere sufficiently to retain its physical shape when mechanical means are used to remove it from the surface on which it deposits, but it may be baked in place and be hard and adherent.

**Sludge, Activated** — Mass of micro-organisms, flocculated and easily settleable, metabolizing organic material in a waste in activated sludge æration tank. This is obtained in settling tanks after æration and returned to the æration tanks for maintaining adequate concentration of micro-organisms.

**Sludge Bed** — An area comprising natural or artificial layers of porous material upon which digested sewage or effluent sludge is dried by drainage and evaporation. A sludge bed may be open to the atmosphere

or covered, usually with a greenhouse-type superstructure. Also called 'sludge drying bed'.

**Sludge Blanket** — A horizontal layer of solids hydrodynamically suspended within an enclosed body of water.

**Sludge Dewatering** — The process of removing a part of the water in sludge by any method, such as draining, evaporation, pressing, centrifuging, exhausting, passing between rollers, or acid flotation, with or without heat. It involves reducing from a liquid to a spadable condition rather than merely changing the density of the liquid ( concentration ) on the one hand or drying ( as in a kiln ) on the other.

**Sludge Volume Index** — *See* Index, Sludge Volume.

**Sludge Drying Bed** — *See* Sludge Bed.

**Sludge Lagoon** — *See* Lagoon, Sludge.

**Sludge Ripening** — The completion of the sludge digestion process.

**Sludge Thickener** — A type of sedimentation tanks in which the sludge is permitted to settle, usually equipped with scrapers travelling along the bottom of the tank which push the settled sludge to a sump, from which it is removed by gravity or by pumping.

**Sodium Cycle** — The operation of a cation exchange cycle wherein the removal of specified cations from the influent water is accomplished by exchange with an equivalent amount of sodium ion from the exchange material.

**Softener, Base Exchange** — Water softener using an ion-exchange material.

**Softening, Water** — The process of removing from water certain mineral substances causing hardness.

**Solids, Dissolved** — Solids which are present in solution.

**Solids, Fixed** — Solids that remain after ignition.

**Solids, Settleable** — Suspended solids that can be removed by sedimentation.

**Solids, Suspended**

a) The quantity of material deposited when a quantity of water, sewage or other liquid is filtered through an asbestos mat in a Gooch crucible.

b) Solids that either float on the surface of, or are in suspension in water, sewage, or other liquids; and which are largely removable by laboratory filtering.

**Solids, Total** — The solids in water, sewage, or other liquids; it included the suspended solids ( largely removable by filter paper ) and the unfilterable solids ( those which pass through filter paper ).

**Solids, Volatile** — The quantity of solids in water, sewage, or other liquid, lost on ignition of the total solids.

**Specific Gravity** — *See* Relative Density.

**Spores** — These are bodies produced within the cells of a considerable number of bacterial species under adverse environmental conditions. They are more resistant to heat, cold, osmosis and chemicals than the vegetative cells producing them.

**Spray Ponds** — Ponds or basins in which cooling water is pumped and sprayed through nozzles, thereby reducing the temperature of the water by evaporation.

**Stabilization** — The ærobic treatment of decomposable organic matter.

**Standard Plate Count** — *See* Count, Standard Plate.

**Staphylococci** — A genus of sphere-shaped, pus-forming bacteria.

**Sterile** — Free from any viable organism, either active or dormant.

**Sterilization** — The destruction of all living organisms, ordinarily through the agency of heat or of some chemical.

**Stream** — A body of flowing water. The term is usually applied to a body of water flowing in a natural surface channel, but is also applied to a body of water flowing in a well-defined, open or closed conduit, a jet of water issuing from any opening, such as a nozzle, a fissure in rock, etc.

**Sullage** — Any liquid household or community waste not containing animal or human excreta.

**Superchlorination** — The application of chlorine to water to provide free residual chlorine in which the residual is usually so large as to require dechlorination.

**Surface Water** — *See* Water, Surface.

**Suspended Matter**

a) Solids in suspension in sewage or effluent.

b) Commonly used for solids in suspension in sewage or effluent which can readily be removed by filtering in a laboratory.

**Suspended Solids** — *See* Solids, Suspended.

## T

**Tank, Detritus** — A tank or channel used in the primary treatment of sewage as a means of removing grit which otherwise might cause damage to machinery.

**Tank, Humus** — A sedimentation tank following biological treatment of sewage for collecting humus sludge.

**Tank, Imhoff** — A deep two-storeyed sewage tank originally patented by Karl Imhoff, consisting of an upper or continuous flow sedimentation chamber and a lower or sludge-digestion chamber. The floor of the upper chamber slopes steeply to trapped slots, through which solids may slide into the lower chamber. The lower chamber receives no fresh sewage directly, but is provided with gas vents and with means for drawing digested sludge from near the bottom.

**Tank, Septic** — A single storey settling tank in which the settled sludge is in immediate contact with the sewage flowing through the tank, while the organic solids are decomposed by anærobic bacterial action.

**Tertiary Treatment** — *See* Treatment, Tertiary.

**Total Matter** — The sum of the particulate matter and dissolved matter.

**Total Solids** — *See* Solids, Total.

**Toxicity, Acute** — Any direct lethal action of pollution to fresh-water fish that is demonstrable within 96 hours or less, following prescribed methods of test.

NOTE — The lethal action includes both internal and external effects, but excludes indirect action such as depletion of dissolved oxygen through chemical or biochemical oxidation of the test material.

**Transmittance** — The ratio of radiant power transmitted by the sample to the radiant power incident on the sample.

NOTE — In practice, the sample is often a liquid or a gas contained in an absorption cell. In this case, the transmittance is the ratio of the radiant power transmitted by the sample in its cell to the radiant power transmitted by some clearly specified reference material in its cell, when both are measured under the same instrument conditions such as spectral position and slit width. In the case of solids not contained in a cell, the radiant power transmitted by the sample is also measured in the presence of that transmitted by a clearly specified reference material. This ratio is called relative transmittance, $T$.

**Treatment, Advanced** — The application to a treated waste water stream of any physical-chemical process or combination of processes to increase the removal of pollutants and render the water more suitable for reuse purposes.

**Treatment, Primary** — A waste water treatment process employed to remove a substantial portion of gross settleable or floatable solids and the accompanying biochemical oxygen demand, utilising sedimentation and/or flotation with suitable mechanical devices.

**Treatment, Secondary** — The treatment of sewage or industrial effluent by biological methods after primary treatment.

**Treatment, Tertiary** — Any waste water treatment process used after secondary treatment that employs physical, chemical or biological methods to further purify effluents of the secondary treatment for possible reuse.

**Trickling Filter** — *See* Filter, Trickling.

**Tubercle** — Nodule formed in the process of corrosion in pipelines.

**Tuberculation** — The formation of tubercles.

**Turbidity** — Reduction of transparency of a sample due to the presence of particulate matter.

**Turbidity, Absolute** — The fractional decrease of incident monochromatic light through the sample, integrating both scattered and transmitted light.

NOTE — For a small amount of scattering experienced in essentially colourless solutions, absolute turbidity of a 1-cm layer corresponds to the extinction coefficient in the equation expressing Lambert's law.

## U

**Use of Water, Domestic** — The use of water primarily for household purposes, the watering of livestock, the irrigation of gardens, lawns, shrubbery, etc, surrounding a house or domicile.

**Use of Water, Industrial** — The use of water primarily in connection with industrial operations.

**Use of Water, Municipal** — The various uses to which water is put in developed urban areas, including domestic use, industrial use, street sprinkling, fire protection, etc. The term is an inclusive one, applied where the uses are varied.

## V

**Velocity, Self-Cleansing** — The velocity at which the flow in a pipe is sufficiently rapid to prevent deposition of solid matter.

**Virus** — A term generally used to denote a living organism which passes through filters which strain out bacteria physically, and which is invisible by ordinary microscopic methods.

**Volatile Matter** — That matter that is changed under conditions of the test from a solid or a liquid state to the gaseous state.

**Volatile Solids** — *See* Solids, Volatile.

## W

**Wastes, Industrial** — The liquid wastes from industrial processes as distinct from domestic or sanitary sewage.

**Water** — A chemical compound consisting of two parts of hydrogen and one part of oxygen. It may have other solid, gaseous, or liquid materials in solution or suspension.

**Water, Boiler Feed** —Water forced into a boiler to take the place of that which is evaporated in the generation of steam.

**Water-Borne Disease** — *See* Disease, Water-Borne.

**Water, Brackish** — Water with a salty taste due to a high concentration of dissolved salts.

**Watercourse** — A channel in which a flow of water occurs either continuously or intermittently and if the latter, with some degree of regularity. Such flow must be in a definite direction. Watercourses may be either natural or artificial.

**Water Formed Deposits** — Any accumulation of insoluble materials derived from water or formed by the reaction of water upon surfaces in contact with water.

NOTE — Deposits formed from or by water in all its phases may be further classified as scale, sludge, corrosion products, or biological deposits. The overall composition of a deposit or some part of a deposit may be determined by chemical or spectrographic analysis; the constituents actually present as chemical substances may be identified by microscopic or biological methods.

**Water, Fresh** — A water low in dissolved salts.

**Water, Ground** — Water in the ground beneath the surface. In a strict sense the term applies only to water below the water table but in the general sense it covers water derived from wells and springs.

**Water, Irrigation** — Water which is artificially applied in the process of irrigation. It does not include precipitation.

**Water, Make-up** — Water added to the boiler feed system to make up for losses.

**Water, Polluted** — Water that contains sewage, industrial waste, or other harmful or objectionable substances.

**Water, Potable** — Water which does not contain objectionable pollution, contamination, minerals, or infection, and is considered satisfactory for domestic consumption.

**Water Quality** — A term used to describe the chemical, physical, and biological characteristics of water in respect of its suitability for a particular purpose. The same water may be of good quality for one purpose or use, and bad for another depending upon its characteristics and the requirements for the particular use.

**Water, Surface** — Water that flows over or rests upon the surface of the lithosphere. It may occur in either liquid or solid state.

**Water Treatment** — Any process which renders a raw water fit for a particular use.

**Water, Waste**

a) In a legal sense, water that is actually wasted or not needed by party wasting the water, or that which, after it has served the purpose for which it was utilized, has been permitted to run to waste or to escape; or which, from unavoidable causes, escapes from ditches, canals, or other conduits, or from reservoirs of the lawful owners of such structures.

b) Water which contains contaminating waste products.

## Z

**Zoogloea** — A jelly-like matrix developed by bacteria. The word is usually associated with activated sludge growth in biological beds.

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| Seth Bhawan, 2nd Floor, Behind Leela Cinema, Naval Kishore Road, LUCKNOW 226001 | 23 89 23 |
| Patliputra Industrial Estate, PATNA 800013 | 26 23 05 |
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