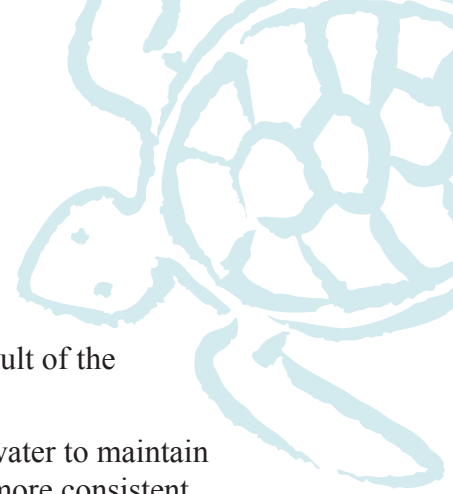


# Wastewater Terms



**Aerobic.** In the presence of air (free oxygen). Aeration tanks are aerobic as a result of the introduction of air.

**Alkalinity.** A measure of the buffering capacity of water. That is, the ability of water to maintain pH. Waters with high alkalinity are well buffered and because of this provide a more consistent habitat for sensitive bacteria. Water with low alkalinity is poorly buffered and subject to potentially toxic pH swings. Nitrifying bacteria need an alkalinity of at least 30-50 mg/L to remain active.

**Ammonia.** A form of nitrogen. In wastewater, ammonia is typically present as ammonium. Ammonia is created by the breakdown of the organic nitrogen forms of urea and fecal material.

**Ammonification.** An anaerobic biological process that converts organic nitrogen to ammonia.

**Anaerobic.** Absent air.

**Anoxic.** Minimal air: not enough to support aerobic treatment, but too much air to allow for anaerobic bacteria (anaerobes) to thrive.

**BOD.** Biochemical Oxygen Demand. A measure of organic pollution. The amount of oxygen a sample of water will consume over a period of five days. Nitrifying bacteria thrive in environments low in BOD, denitrifying bacteria need a high BOD loading to live.

**Denitrification.** The biological conversion of nitrate ( $\text{NO}_3$ ) to nitrogen gas ( $\text{N}_2$ ).

**F:M Ratio.** Food to Microorganism Ratio. An expression used to describe the quantity of organic waste that bacteria consume during the wastewater treatment process. The higher the F:M Ratio, the more BOD that exists for every unit of Mixed Liquor.

**Fermentation.** Incomplete anaerobic digestion that produces volatile fatty acids (VFAs).

**Hydrolysis.** Another word for Ammonification.

**MGD.** Million Gallons per Day. A measure of flow. Wastewater flows are typically reported in “millions of gallons per day.” Much like the term “miles per hour,” MGD is used for any period of time: week, day, hour, or even instantaneous.

**MCRT.** Mean Cell Residence Time. An expression used to describe the average age of bacteria in a wastewater treatment plant. Similar, but not identical to Sludge Age.

**mg/L.** Milligrams per Liter. A metric measure of concentration. Because one liter of water weighs 1,000,000 milligrams, one mg/L is equivalent to one part per million, PPM.

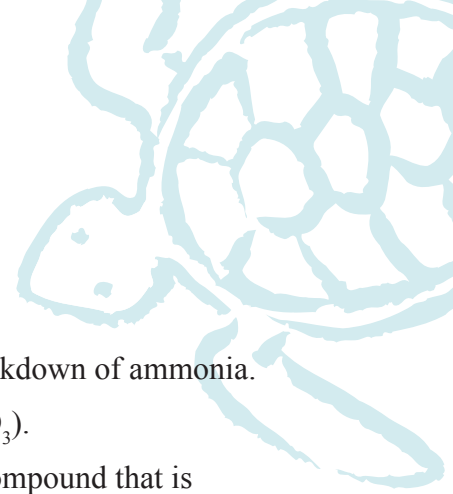
**Mixed Liquor.** The bacteria in an aeration tank.

**MLSS.** Mixed Liquor Suspended Solids. A measure of concentration of the bacterial population in a wastewater treatment plant aeration tank that includes organic and inorganic matter.

**MLVSS.** Mixed Liquor Volatile Suspended Solids. A more precise measure of concentration of the bacterial population in a wastewater treatment plant aeration tank that includes organic matter only.



# Wastewater Terms [2]



**Nitrate.** A form of nitrogen. In wastewater, nitrate is created by the aerobic breakdown of ammonia.

**Nitrification.** The biological conversion of ammonia ( $\text{NH}_3$ ,  $\text{NH}_4$ ) to nitrate ( $\text{NO}_3$ ).

**Nitrite.** A form of nitrogen. In wastewater, nitrite is an intermediate chemical compound that is formed during nitrification and denitrification. Chlorination disinfection becomes difficult when effluents contains any nitrite.

**Nitrogen.** The chemical element “N.” Nitrogen exists in any number of chemical forms: organic-Nitrogen, ammonia, nitrite, nitrate, and nitrogen gas.

**Nitrogen Gas.** A form of nitrogen. In wastewater, nitrogen gas is by the anaerobic breakdown of nitrate. Nitrogen gas bubbles into the atmosphere. Air is primarily nitrogen and a lesser amount oxygen.

**ORP.** Oxygen Reduction Potential. The ORP meter is an instrument for measuring biochemical activity. Positive ORP reading are generally indicative of aerobic conditions; negative ORP readings generally indicate anaerobic conditions.

**ortho-Phosphate.** The most common form of phosphorus in wastewater. Can be expressed “as  $\text{PO}_4$ ” or “as P.”

**PAO.** Phosphate-Accumulating Organism. Bacteria that provide biological phosphorus removal.

**PPM.** Parts per Million. A measure of concentration. Ten thousand “parts per million” equals one percent.

**Phosphorus.** The chemical element “P.” Phosphorus exists in any number of chemical forms; however in wastewater the most common form by far is phosphate, specifically ortho-phosphate.

**Phosphate.** A group of phosphorus chemicals of which ortho-phosphate is by far the most common in municipal wastewater treatment.

**Sludge Age.** An expression used to describe the average age of bacteria in a wastewater treatment plant. Similar, but not identical, to MCRT.

**TSS.** Total Suspended Solids. A measure of particulate pollution, TSS describes the amount of particulate matter than can be filtered out of water.

**total-Nitrogen.** The sum of TKN (ammonia plus organic-nitrogen), nitrate and nitrite.

**total – Phosphorus.** A sum of all phosphorus components.

**VFAs.** Volatile Fatty Acids. Compounds formed during anaerobic fermentation that are useful as carbon sources for denitrification and as a treatment aid for biological phosphorus removal. The most common VFAs are acetic acid, propionic acid, and butyric acid, isobutyric acid, valeric acid, and isovaleric acid.

