Acronyms & Glossary

Updated August 28, 2018

Activated Sludge – Sludge particles produced by the growth of organisms in the aeration tank in the presence of dissolved oxygen. The term "activated" comes from the fact that the particles are teeming with bacteria, fungi, and protozoa. Activated sludge is different from primary sludge in that the sludge particles contain many living organisms which can feed on the incoming wastewater.

Activated Sludge Process – A biological wastewater treatment process that converts non-settleable (suspended, dissolved and colloidal solids) organic materials to a settleable product using aerobic and facultative micro-organisms and dissolved oxygen. After some time in the aeration tanks, the activated sludge enters the final clarifiers and is allowed to settle out by sedimentation and is reused (returned to the aeration tank) as needed or disposed of (wasted). The remaining wastewater then undergoes additional treatment as required (i.e. disinfection, nutrient removal).

Advanced Wastewater Treatment – Any physical, chemical or biological wastewater treatment process used to accomplish a higher degree of treatment (such as nitrogen and phosphorus removal (nutrient removal)) greater than that achieved by secondary treatment. Also, called Tertiary Treatment.

Aeration Tanks – Tanks that are aerated with mechanical aerators or by diffused air that contain the biological wastewater treatment process that converts non-settleable (suspended, dissolved and colloidal solids) organic materials to a settleable product using aerobic and facultative micro-organisms and dissolved oxygen.

Aerobic – A condition in which atmospheric, or dissolved oxygen is present in the water environment.

AHU – Air handling unit that provides Heating, ventilation and air conditioning.

ALCO – Original backup generator in lower level of dewatering building. Only provides back up power to raw sewage pumps and misc. circuits.

Ammonia – A chemical combination of hydrogen and nitrogen occurring extensively in nature. The combination used in water and wastewater is expressed as NH_3.

Ammonia Nitrogen – The quantity of elemental nitrogen in the form of ammonia (NH_3).

Anaerobic – A condition in which free and dissolved oxygen is unavailable.

Anoxic – Condition in which oxygen is available in the combined form only; there is no free oxygen. Anoxic sections in the activated-sludge process may be used for denitrification.

Bar Rack Building – part of the raw sewage pump building where rags are screened prior to treatment.

BOD - Biochemical Oxygen Demand – The rate at which organisms use the oxygen in water or wastewater while stabilizing decomposable organic matter under aerobic conditions. In decomposition, organic matter serves as food for the bacteria and energy results from its oxidation. BOD measurements are used as a measure of the organic strength of wastes in water.

Biochemical Oxygen Demand (BOD) Test – A procedure that measures the rate of oxygen use under controlled conditions of time and temperature. Standard test conditions include dark incubation at 20^{o} C for a specified time (usually five days).

Biomass – The mass of a biological material (living organisms) contained in a system feeding on the wastes in wastewater, dead organisms and other debris.

CAC – Certification Advisory Committee **–** DEEP's Wastewater Operator Certification.

CAWPCA – Connecticut Association of Water Pollution Control Agencies.

CBIA – Connecticut Business and Industry Association in Hartford**.**

EPC – CBIA's Environmental Policy Committee.

CBOD – Carbonaceous Biochemical Oxygen Demand **-** Same as BOD except a nitrification inhibitor is added to suppress contribution from autotrophic bacteria. This test is currently run for our NPDES permit.

CCM – Connecticut Conference of Municipalities.

CCTV – Closed Circuit Television.

CEMS – Continuous Emission Monitoring Systems **–** The District has a Carbon Monoxide CEMS installed on the sewage sludge incinerator stack.

Centrate – The water that is removed from sludge when sludge is thickened in a centrifuge.

Centrifuges – A machine with a rapidly rotating container that applies centrifugal force to its contents, typically to separate fluids of different densities or liquids from solids.

COD - Chemical Oxygen Demand **–** A measure of the oxygen-consuming capacity of organic matter present in wastewater. COD is expressed as the amount of oxygen consumed from a chemical oxidant in mg/L during a specific test. Results are not necessarily related to the biochemical oxygen demand (BOD) because the chemical oxidant may react with substances that bacteria do not stabilize.

Cone Valves - Is a divergent valve with a cone-shaped head in a fixed cylinder, this spreads water around the wide, downstream end of the cone in spillways of dams or hydroelectric facilities.

COST – Council of Small Towns in Connecticut.

Denitrification – The biological conversion of nitrate (NO_3) and Nitrite (NO_2) in wastewater to nitrogen gas (N_2) in the absence of dissolved gas.

DEP – Connecticut Department of Environmental Protection (Old – prior to 2010)

DEEP – Connecticut Department of Energy and Environmental Protection (New - since 2010)

Demand Response - Is a change in the power consumption of an electric utility customer to better match the demand for power with the supply.

Detroiters – The equipment that slows the wastewater down to 2 feet/second (fps) to allow for grit and other solids to settle out of the influent wastewater.

Dewatering Building – The building is used to separate sludge into a liquid and a solid part.

Diffuser – A porous plate, tube, or other device through which air is forced and divided into minute bubbles for diffusion in liquids. In the activated-sludge process it is a device for dissolving air into mixed liquor.

DMR – Discharge Monitoring Report.

Disinfection – The process by which pathogenic organisms are killed in wastewater effluent, most commonly by chlorination. The District uses Sodium Hypochlorite solution.

Effluent – Treated wastewater.

Enernoc Generators – The New generator in place as of 2018.

EPA – Federal Environmental Protection Agency.

FBI – Fluidized Bed Incinerator – The principle of fluidization is the process where a granular material in a solid state is turned into a fluid-like state by passing a fluid (liquid or gas) through it, this takes place in the Incinerator.

GAC – Granular Activated Carbon incinerator emissions control device for Mercury and other hard to remove contaminants.

GPLPE – General Permit to Limit the Potential to Emit – CT DEEP Permit.

HVAC – Heating, ventilation and air conditioning unit.

IFAS – Integrated Fixed Film Activate Sludge – A secondary treatment modification consisting of plastic, sponges, or mop type thread media to improve an advanced treatment system's ability to remove nitrogen.

I/I – Infiltration/Inflow

Infiltration – The seepage of water into sewer lines through cracks and joints in the sewer lines.
Inflow – The inflow of water into sewer lines in large volumes through large cracks and/or breaks in sewer lines or illegal connections (down spouts, sump pumps, etc.) into sewer lines.

Influent – Raw wastewater sewage.

MCC – Motor Control Center – Electrical, controls equipment and transfers power to other locations.

MCRT – Mean Cell Residence Time **–** The average time that a given unit of cell mass stays in the activated-sludge aeration tank. It is usually calculated as the total mixed liquor suspended solids in the aeration tank divided by the combination of solids in the effluent and solids wasted.

MGD or mgd – million gallons per day

mg/l – milligrams/liter – ppm – parts per million

ug/l – micrograms/liter – ppb – parts per billion

ng/l – nanograms/liter – ppt – parts per trillion

Microorganisms – Organisms that breakdown wastewater in the activated sludge process.

Mixed Liquor – A mixture of raw or settled wastewater and activated sludge contained in an aeration tank in the activated sludge process.

MLSS – Mixed Liquor Suspended Solids **–** The concentration of suspended solids in activated sludge mixed liquor.

Modified Ludzack-Ettinger Process, 4-Stage Bardenpho Process (with Side stream Reactor) – Nitrogen treatment processes.

MSDS - Material Safety Data Sheet **– now GHS –** Global Harmonized System **–** A document which provides pertinent information and a profile of a particular hazardous substance or mixture.

NEWEA – New England Water Environment Association **–** The New England Organization that represents the Wastewater Industry. The National Organization is **WEF – Water Environment Federation.**

NEIWPCC – New England Interstate Water Pollution Control Commission **–** An organization formed by the New England Governors/States to coordinate all pollution related issues throughout New England.

Nitrogen – An essential nutrient that is present in wastewater as ammonia, nitrate, nitrite, and organic nitrogen.

Nitrification – The oxidation of ammonia (NH_3) to nitrate (NO_3) and nitrite (NO_2) in wastewater by autotrophic bacteria. This aerobic process requires significant amounts of oxygen.

NSR Permit – New source review Incinerator Operating (Air Permit.)

NPDES Permit - National Pollutant Discharge Elimination System Permit – An NPDES Permit is the regulatory agency document issued by either a federal (EPA) or state agency (DEP) which is designed to control all discharges of pollutants from point sources into U.S. waterways. NPDES permits regulate discharges into navigable waters from all point sources of pollution, including industries, municipal wastewater treatment plants, sanitary landfills, large agricultural feed lots and return irrigation flows. (Discharge Permit)

ORP – Oxidation Reduction Potential – The activity or strength of oxidizers and reducers in relation to their concentration. Measured in millions (mV), chlorinated water will show a positive ORP value. 500 mV or more will strip H_2S gas in a wet scrubber odor tower.

Parshall Flume – A specially designed and constructed structure/device used to measure flows in an open channel. Used in conjunction with an ultrasonic meter.

Primary Treatment – The first major treatment process in a wastewater treatment facility: typically, by sedimentation. The removal of a substantial amount of suspended matter, and small amounts colloidal and dissolved matter.

Primary Settling Tanks – The first settling tank for the removal of settleable solids through which wastewater is passed in a treatment facility. These tanks are sometimes called primary sedimentation tanks or primary clarifiers.

RAS/WAS – Return Activated Sludge/Waste Activated Sludge **–** Return Activated Sludge is sludge that is pumped from the final clarifiers to the aeration tanks. Waste Activated Sludge is sludge that is pumped from the final clarifiers to the primary tanks.

RSP – Raw Sewage Pumps.

RFQ – Request for Qualifications.

RFP – Request for Proposals.

RTU – Roof Top Unit, (same as AHU)

ROW – Right of Way.

SCADA - Supervisory Control and Data Acquisition **– S**upervisory **C**ontrol and **D**ata **A**cquisition is a computer software system which enables the operating staff to run most of the facility from a central control room, while providing the supervisory staff with a real-time picture of plant operations in their office.

SCFM – Standard Cubic Feet per Minute **– C**ubic **F**eet of air per **M**inute at **S**tandard conditions of temperature, pressure and humidity (0ºC, 14.7 psia and 50% relative humidity).

Secondary Treatment – Generally, a level of treatment that produces an effluent that is permitted to be discharged directly to a receiving stream without any additional treatment other than disinfection. Sometimes called and used interchangeably with the term activated-sludge process and consists of aeration tanks and secondary clarifiers.
SDS – Safety Data Sheet - **now known as GHS –** Global Harmonized System – A document which provides pertinent information and a profile of a particular hazardous substance or mixture.

Secondary Clarifiers – A settling tank following the activated-sludge aeration tanks designed to remove by gravity part of the suspended matter coming from the aeration tanks in the secondary treatment system. Also called **Final Settling Tanks** or in our case **Final Clarifiers**.

Sidestream Reactor – A specially designed aeration tank that combines our centrate and RAS flows to convert some ammonia to nitrate and nitrite before reaching our aeration tanks.

Sludge – The solids removed from wastewater with a solids concentration high enough (2% to 10%) that the wastewater stream may not readily flow.

Sludge Cake – Dewatered sludge with a solids concentration high enough to permit handling as a solid material (20-30% solids concentration.)

Sludge dewatering – The process of removing a part of the water in sludge by methods such as draining, evaporation, pressing, vacuum filtration, centrifuging, belt presses, or dissolved air flotation, with or without heat.

Solids Handling Equipment – Dewatering equipment (centrifuges) required prior to incineration.

SS - Suspended Solids **–** Solids that either float on the surface or are suspended in water, wastewater or other liquids.

SSI – Sewage Sludge Incineration.

TSS – Total Suspended Solids **–** A measure of total solids in a liquid that can be captured by a filter.

Tertiary Treatment – The treatment of wastewater beyond the secondary or biological stage: normally implies the removal of nutrients, such as nitrogen and phosphorus, and a high percentage of suspended solids. Also called Advanced Wastewater Treatment.

Title V – CT DEEP Air Permit.

UV Disinfection – The disinfection of wastewater effluent with Ultra-Violet (UV) light systems: to destroy pathogens, e-coli, etc.

UST – Underground Storage Tanks.

Venturi Scrubber – An emissions control device installed on the incinerator exhaust stack.

VFD – Variable Frequency Drive.

Wet Chemical Scrubber – An odor control system that utilizes Sodium Hydroxide to remove odors.

WESP – WET Electro Static Precipitator **–** An emissions control device installed on the incinerator exhaust stack.