

# GLOSSARY

**ACC—alternative compliance criteria:** A group of eight options that a plant can use to demonstrate that it has achieved optimum TOC removal even though it has been unable to achieve a Step 1 or Step 2 removal ratio of at least 1.0.

**baffling characteristics:** The design features of a disinfection contact basin that determine how effectively the basin prevents water from passing through it before being adequately disinfected.

**BWN—Boil Water Notice:** A notice sent by public water systems to their customers, informing them that they should boil their drinking water to kill potentially harmful bacteria. Public water systems that violate regulations related to the protection of potentially immediate health risks must send customers a BWN in addition to their required public notice for the violation.

**CAP—corrective-action plan:** A written plan to improve specific design, operational, maintenance, or administrative problems at a public water system. A CAP will fall into one of two categories: (1) a voluntary CAP that is prepared as soon as the water system identifies a problem, or (2) a mandatory CAP that must be prepared following a mandatory comprehensive performance evaluation. The voluntary CAP should include (and the mandatory CAP must include) specific actions that a water system will take to correct a problem and the schedule for implementing those changes.

**cell:** A spot on the spreadsheet where data can be recorded. It is the intersection of a specific row and column. For example, the first cell in a spreadsheet is cell “A1” and is located at the point where column “A” and row “1” intersect.

**CFE—combined filter effluent:** The water produced by all of the filters at a surface water treatment plant after it has been blended. The CFE is the combined water from the individual-filter-effluent (IFE) streams. At most plants, CFE measurements are conducted on the water entering the clearwell—although, at plants with more than one clearwell fill line, the samples may need to be collected at the outlet of the clearwell. A plant must obtain our approval to use a CFE turbidity monitoring point that is not located on the clearwell fill line. The CFE is also frequently called “treated” or “finished” water.

**comment box:** A note that is attached to a single cell in a spreadsheet. In the case of the SWMOR, the comment box contains useful information to help you enter the proper data in the cell.

**CPE—comprehensive performance evaluation:** An extensive analysis of the design, operation, maintenance, and administration of a surface water treatment plant that is conducted to identify the factors that are limiting the facility’s ability to produce high-quality drinking water. A public water system may have a CPE conducted as part of a voluntary effort to improve the performance of its surface water treatment plant; these CPEs are referred to as voluntary, or optimization, CPEs (oCPEs). If a treatment plant has individual-filter-effluent turbidity readings that exceed 2.0 NTU for two consecutive months, we will require the water system to participate in a mandatory CPE conducted by

a third party; this kind of CPE is called a mandatory, or compliance, CPE (mCPE). At plants that are allowed to monitor CFE instead of monitoring IFE, the exceedance is based on the turbidity level of the combined filter effluent instead of the turbidity level at the effluent of an individual filter.

**clearwell:** A storage unit, usually located at the plant site, that contains treated water before it is pumped to the distribution system. Some plants refer to their clearwells as “ground storage tanks.”

**CT:** The result when the disinfection concentration at the end of a disinfection zone,  $C$ , is multiplied by the contact time,  $T_{10}$ , within the disinfection zone.

**CT study:** An evaluation of the disinfection protocol, or process, used at a treatment plant. The purpose of the CT study is to identify the number of disinfection zones at a plant; determine the effective contact time, or  $T_{10}$ , available in each zone; and define the minimum level of disinfection that must be provided at the plant.

**CT-study-approval letter:** The letter that the TCEQ sends when it approves a proposed disinfection protocol. The letter identifies the approved disinfection zones and establishes the relationship between the flow rate through that zone and the disinfectant contact time, or  $T_{10}$ , within the zone.

**CT-study template:** A Microsoft Excel workbook that contains the macros needed to define up to 10 disinfection zones. The workbook is used to evaluate alternative disinfection protocols and is submitted to the TCEQ when requesting permission to revise a plant’s disinfection protocol.

**disinfection zone:** A segment of the treatment plant where disinfection occurs. A disinfection zone contains one or more treatment units and the associated piping. A disinfection zone is defined as that section of the plant starting at a disinfectant injection or monitoring point, and ending at the subsequent disinfectant injection or monitoring point. Every disinfectant injection point is the start of a new disinfection zone, even if it is not always used. Every injection point must have an associated monitoring point. However, a plant may have only one disinfectant point and choose to monitor at more than one point, creating multiple disinfection zones.

**distribution system:** The system of pipes that delivers treated water to customers. Typically, the distribution system does not begin until the water leaves the grounds of the treatment plant.

**effluent:** The point where water leaves a treatment unit, such as a filter.

**event:** A single isolated occasion when something (usually bad) happens. The event begins when the abnormal condition starts occurring and ends when normal conditions are reestablished. For example, a single elevated IFE turbidity event begins when the desired turbidity level is exceeded and does not end until the desired turbidity level is reached again.

**filter assessment:** A comprehensive evaluation of design, maintenance, operation, and performance of an individual filter and its associated facilities.

**filter exceedance:** In the context of this manual, a filter exceedance is an event when the water produced by an individual filter has a turbidity level above the performance goal established by the TCEQ for two consecutive 15-minute readings. One example of a filter exceedance is when the turbidity level in the water produced by an individual filter rises above 1.0 NTU for two consecutive 15-minute readings. A filter exceedance is not the same thing as a treatment-technique violation, but a severe exceedance on one or more filters may cause the plant to violate a treatment-technique requirement for treated-water turbidity levels. At plants that are allowed to monitor CFE instead of monitoring IFE, the exceedance is based on the turbidity level of the combined filter effluent instead of the turbidity level at the effluent of an individual filter.

**filter profile:** A graph that shows the turbidity level of the water produced by an individual filter for an entire filter run and explains the cause of every event where consecutive turbidity readings change by more than 0.1 NTU. At plants that are allowed to monitor CFE instead of monitoring IFE, the filter profile will be prepared using the combined filter effluent monitoring point instead of the monitoring points on individual filters.

**finished water:** The water leaving a treatment plant; water that has passed through all of the treatment units. Finished water is sometimes called treated water.

**HAA5—haloacetic acids (group of five):** The five haloacetic acid species used to determine compliance with the haloacetic acid maximum contaminant level (MCL). Haloacetic acids are formed when naturally-occurring organic material (NOM) is exposed to halogenated chemical disinfectants such as chlorine. The HAA5 group consists of monochloroacetic acid (MCAA), dichloroacetic acid (DCAA), trichloroacetic acid (TCAA), monobromoacetic acid (MBAA), and dibromoacetic acid (DBAA).

**IFE—individual-filter effluent:** The water produced by a single filter.

**IESWTR—Interim Enhanced Surface Water Treatment Rule:** The first federal regulation to require surface water treatment plants to begin producing treated water with a turbidity level of 0.3 NTU and to impose IFE monitoring requirements on these plants.

**inactivation ratio (IR):** The method used to determine if a surface water treatment plant has met the daily minimum disinfection requirements. The value of IR is determined by dividing the value of  $CT_{\text{actual}}$  by that of  $CT_{\text{required}}$ . An inactivation ratio of 1.0 or above for both virus and *Giardia* is required to meet the disinfection requirements.

**individual filter:** A filtration unit that has its own influent and its own effluent.

**influent:** The point where water enters a treatment unit, such as a filter.

**LT1—Long-Term 1 Enhanced Surface Water Treatment Rule:** The federal regulation that required treatment plants serving fewer than 10,000 people to meet essentially the same monitoring and performance requirements as larger treatment plants.

**LT2—Long-Term 2 Enhanced Surface Water Treatment Rule:** The federal regulation that required additional treatment by plants with elevated *Cryptosporidium* concentration in their source water.

**macro:** A small computer program that automatically performs specific tasks. There are several macros in the SWMOR and SWMOR2 spreadsheets that do things like circling empty cells that should contain data.

**MD—missing data:** The value entered in a data-entry cell when a plant collected some, but not all, of the required data needed to complete part of the report. For example, if the plant only collected some of the individual filter effluent turbidity data that should have been collected on a given date (and none of the readings that were collected indicate that there was a filter problem), the operators would enter <MD> in the appropriate cell.

**monitoring requirement:** A test that must be run in order to meet minimum state and federal standards. For example, some of the monitoring requirements include tests for treated-water turbidity, individual filter turbidity, water temperature, and disinfectant residuals.

**monthly average:** The number obtained by dividing the sum of a set of values obtained during a given month by the number of values. The monthly average is calculated by adding all of the results obtained in a given month and then dividing the sum by the number of samples.

**ND—no data:** The value entered in a data entry cell when a plant failed to collect any of the required data needed to complete part of the report. For example, if the plant failed to measure the turbidity level of the finished water at one of the required sampling times, the operators would enter <ND> in the appropriate cell to indicate that the data point was not collected.

**NTU—Nephelometric Turbidity Unit:** The unit of measurement for turbidity.

**PODR—point of diminishing returns:** The point at which an additional 10 mg/L of alum results in the removal of no more than 0.3 mg/L of TOC when conducting a Step 2 jar test. The level of TOC removed in the jar where the PODR is reached is the value used to establish the required TOC removal for the treatment plant.

**protected cell:** A cell in the spreadsheet where you cannot enter data.

**quarterly average:** The weighted average of all the results obtained in a given calendar quarter. For tests run on a quarterly basis, the quarterly average is calculated by summing the results of all the samples analyzed in a given quarter and then dividing the sum by the number of samples. For tests run on a daily or monthly basis, the quarterly average is calculated by summing the three monthly averages obtained in a given calendar quarter and then dividing the sum by 3, the number of months in the quarter.

**RAA—running annual average:** The weighted average of all the results obtained during four consecutive calendar quarters. For tests run quarterly, monthly, or daily, the RAA is calculated by summing the quarterly averages for four consecutive quarters and then dividing the sum by 4. In the absence of quarterly results, the RAA will be calculated based on the available data.

**raw water:** The untreated water entering a treatment plant.

**reporting month:** The month during which you collected the data being reported.

**settled water:** The water leaving a sedimentation basin before it passes through the filter.

**spreadsheet:** An electronic file containing data that is arranged by rows and columns. In the case of the SWMOR and SWMOR2, it is an electronic file containing some of the performance data collected at a single surface water treatment plant during a single month.

**Stage 1 Disinfectants and Disinfection Byproducts Rule—DBP1:** The federal rule that required total organic carbon removal and monitoring plans for surface water treatment plants.

**Step 1 removal ratio:** A standard method used to evaluate the TOC removal achieved at a plant. The Step 1 removal ratio is determined by dividing the percentage of the raw water TOC that a plant actually removed by the percentage of TOC that the plant should be able to remove using enhanced coagulation.

**Step 2 removal ratio:** An alternative method used to evaluate the TOC removal achieved at a plant. The Step 2 removal ratio is determined by dividing the percentage of the raw water TOC that a plant actually removed by the percentage of TOC removed at the point of diminishing returns established through Step 2 jar testing.

**SUVA—specific ultraviolet-light absorbance:** An indirect indicator of whether the organic carbon in a sample of water is humic or non-humic in origin. SUVA is calculated by dividing a sample's ultraviolet absorption at a wavelength of 254 nm (UV254) (in inverse meters) by its concentration of dissolved organic carbon (DOC) (in milligrams per liter). It is more difficult to remove the TOC in water that has a SUVA value that is less than or equal to 2.0 L/mg-m.

**T<sub>10</sub>:** The amount of time it takes for ten percent of the water that enters a disinfection zone at a given time to pass through the treatment units within that zone.

**TOC—total organic carbon:** A surrogate parameter used to evaluate the level of naturally-occurring organic matter (NOM) that will form disinfection by-products when exposed to a chemical disinfectant.

**TOC sample set:** A group of three samples that include a raw water alkalinity sample, a raw water TOC sample, and a treated water TOC sample which have all been collected at approximately the same time.

**TTHM—total trihalomethanes:** A group of disinfectant by-products that form when naturally-occurring organic materials (NOM) are exposed to halogenated chemical disinfectants such as chlorine. The four THMs of interest are chloroform (three chlorines, also called “trichloromethane”), dichlorobromomethane, dibromochloromethane, and bromoform (three bromines; also called “tribromomethane”).

**train:** A series of treatment units that operate as a single unit within a treatment plant. Surface water treatment plants may contain one or more treatment trains that operate side by side. See Figure B-7 in Appendix B for more information.

**treated water:** The water leaving a treatment plant; water that has passed through all of the treatment units. Treated water is sometimes called finished water.

**treatment technique requirement:** A minimum level of treatment that must be achieved before the water meets minimum state and federal standards. Treatment technique requirements are equivalent to maximum contaminant levels (MCLs). However, the treatment technique requirement indirectly limits the risk posed by a specific contaminant, while the MCL limits the specific contaminant itself. For example, the treatment technique requirements for turbidity and disinfection have been set instead of setting MCLs for the pathogens *Cryptosporidium parvum*, *Giardia lamblia*, *Legionella*, and enteric viruses.

**worksheet:** One page of a spreadsheet. The SWMOR spreadsheet contains eight worksheets that produce as many as 16 printed pages and the SWMOR2 contains nine worksheets that have a total of 14 printed pages.