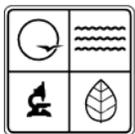


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# Guidance for Water Quality and Antidegradation Review Assistance

A Technical Reference Guide



Missouri  
Department of  
Natural Resources

Prepared by

Division of Environmental Quality, Water Protection Program

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**Missouri Department of Natural Resources**  
Water Protection Program  
Water Pollution Control Branch

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Guideline 5: Total Ammonia Nitrogen Criteria Implementation Guidance.

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## **Glossary of Terms**

**Acceptable Effluent Concentration (AEC)** – In a whole effluent toxicity test, the concentration of effluent that equals the computed percent effluent at the edge of the mixing zone for chronic tests, or at the edge of the zone of initial dilution for acute tests, at the 7Q10 low flow.

**Acute** – A stimulus severe enough to rapidly induce a response; in aquatic toxicity tests, an effect observed in 96 hours or less is typically considered acute. When referring to aquatic toxicology or human health, an acute effect is not always measured in terms of lethality.

**Acute criteria** – The maximum instantaneous or one (1) hour average concentration of a toxic substance or effluent that ensures adequate protection of sensitive species of aquatic organisms from acute toxicity resulting from exposure to toxic substances or effluent. Acute criteria will adequately protect the designated aquatic life use if not exceeded more than once every three (3) years. The terms “acute criteria” and “criteria maximum concentration” (CMC) are equivalent.

**Acute toxicity** – Conditions producing adverse effects or lethality on aquatic life following short-term exposure. The acute criteria in Tables A and B of 10 CSR 20-7.031 are maximum concentrations which protect against acutely toxic conditions. Acute toxicity is also indicated by exceedence of whole-effluent toxicity (WET) test conditions of paragraph 10 CSR 20-7.031(3)(I)2. For substances not listed in Table A or B of 10 CSR 20-7.031, 0.3 of the median lethal concentration, or the no observed acute effect concentration for representative species, may be used to determine absence of acute toxicity.

**Anti-backsliding** – A provision in the Federal Regulation [CWA §303(d)(4); CWA §402(c); CFR §122.44(I)] and adopted in State Regulation [10 CSR 20-6.010(9)(A)] that requires a reissued permit to be as stringent as the previous permit, with some exceptions.

**Antidegradation** – The implementation of a rule and procedure approved by the United States Environmental Protection Agency (EPA) and the Missouri Clean Water Commission that specifies how the Missouri Department of Natural Resources will determine, on a case-by-case basis, whether and to what extent, existing water quality may be degraded in a water of the state.

**Anthropogenic** – Of or resulting from human activities or influence. Anthropogenic conditions are those that result from human interaction with the environment. Non-anthropogenic conditions are those that occur due to natural processes without human influence.

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**Assimilative Capacity or Loading Capacity** – The greatest amount of pollutant loading that a water body can receive without violating water quality standards.

**Average Monthly Limit (AML)** – The highest allowable value for the average of daily discharges obtained over a calendar month. An average monthly limit is determined through a comparison of technology and water quality based effluent limitations. Compliance is calculated as the sum of all daily discharges measured during that month divided by the number of days on which monitoring was performed.

**Average Weekly Limit (AWL)** – The highest allowable value for the average of daily discharges obtained over a calendar week. An average weekly limit is determined through application of technology based effluent limitations and is applied predominantly to publicly owned treatment works. Compliance is calculated as the sum of all daily discharges measured during a calendar week divided by the number of daily discharges measured during that week.

**Background Conditions** – The biological, chemical, and physical condition of waters measured at a location upstream of the influence of an individual point or nonpoint source. Background conditions represent natural, non-anthropogenic conditions within a waterbody.

**Beneficial or Designated Uses** – Those uses specified in the water quality standards [10 CSR 20-7.031(1)(C)1.-15.] for each water body segment whether or not they are attained. Beneficial or designated uses 10 CSR 20-7.031(1)(C)1.-11. of classified waters are identified in 10 CSR 20-7.031, Tables G and H. Beneficial or designated uses 10 CSR 20-7.031(1)(C)12.-15. of classified waters must be determined on a site-by-site basis and are therefore not listed in 10 CSR 20-7.031, Tables G and H. The beneficial uses of a water are dependent upon actual use, the ability of the water to support the use now or in the future, and the likelihood the water being used in a given manner. The use of water for the purpose of wastewater dilution or as a receiving water for a waste treatment facility is not a beneficial use.

**Best Available Technology Economically Achievable (BAT)** – Technology-based standard established as the most appropriate means available for controlling the direct discharge of toxic and nonconventional pollutants. BAT effluent limitations guidelines, in general, represent the best existing performance of treatment technologies that are economically achievable within an industrial point source category or subcategory. BAT effluent limitations apply to non-conventional and toxic pollutants.

**Best Conventional Pollutant Control Technology (BCT)** – Technology-based standard for the discharge from existing industrial point sources of conventional pollutants. The BCT is established in light of a two-part “cost reasonableness” test which compares the cost for an industry to reduce its pollutant discharge with the cost to a POTW for similar levels of reduction of a pollutant loading. The second test examines the cost-effectiveness

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of additional industrial treatment beyond BPT. EPA must find limits which are reasonable under both tests before establishing them as BCT.

**Best Practicable Control Technology Currently Available (BPT)** – Technology-based standard established by the Clean Water Act to control pollutants discharged to waters of the United States. BPT effluent limitations guidelines are generally based on the average of the best existing performance by plants within an industrial category or subcategory. BPT effluent limitations apply to all pollutants (conventional, non-conventional, and toxic).

**Best Professional Judgement (BPJ)** – The method used by permit writers to determine effluent limitations, monitoring requirements, and/or permit conditions on a case-by-case basis using all reasonably available and relevant data.

**Bioaccumulation** – The process by which a compound is taken up by and accumulated in the tissues of an aquatic organism from the environment, both from water and through food.

**Biochemical Oxygen Demand (BOD)** – A measurement of the amount of oxygen utilized by the decomposition of organic material in a wastewater sample over a specified period of time, usually five (5) days. Chemically BOD represents the sum of carbonaceous biochemical oxygen demand (CBOD) and nitrogenous biochemical oxygen demand (NBOD) in the sample.

**Chronic** – Involving a stimulus that lingers or continues for a relatively long period of time, often one-tenth (0.1) of the life span or more. Chronic should be considered a relative term depending on the life span of an organism. The measurement of a chronic effect can be reduced growth, reduced reproduction, etc., in addition to lethality.

**Chronic criteria** – The four (4) day average concentration of a toxic substance or effluent that ensures adequate protection of sensitive species of aquatic organisms from chronic toxicity resulting from exposure to toxic substances or effluent. One exception to the four- (4) day averaging period are chronic criteria for total ammonia nitrogen that are thirty- (30) day average concentrations. Chronic criteria will adequately protect the designated aquatic life use if not exceeded more than once every three (3) years. The terms “chronic criteria” and “criteria continuous concentration” (CCC) are equivalent.

**Chronic toxicity** – Conditions producing adverse effects on aquatic life or wildlife following long-term exposure but having no readily observable effect over a short time period. Chronic numeric criteria in Tables A and B of 10 CSR 20-7.031 are maximum concentrations which protect against chronic toxicity; these values shall be considered four (4)-day averages excepting total ammonia nitrogen which are thirty (30)-day averages. Chronic toxicity is also indicated by exceedence of WET test conditions of subsection 10 CSR 20-7.031(4)(P). For substances not listed in Table A or B of 10 CSR

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20-7.031, commonly used endpoints such as the no-observed effect concentration or inhibition concentration of representative species may be used to demonstrate absence of toxicity.

**Clean Water Act (CWA)** – An act passed by the United States Congress to control water pollution. Formerly referred to as the Federal Water Pollution Control Act of 1972 or Federal Water Pollution Control Act Amendments of 1972 (Public Law 92-500), 33 U.S.C. 1251 et seq., as amended by: Public Law 96-483; Public Law 97-117; Public Laws 95-217, 97-117, 97-440, and 100-04.

**Code of Federal Regulations (CFR)** – A codification of the final rules published in the *Federal Register*. Title 40 of the CFR contains the environmental regulations.

**Combined Sewer Overflow (CSO)** – A discharge of untreated wastewater from a combined sewer system at a point prior to the headworks of a publicly owned treatment works. CSOs generally occur during wet weather (rainfall or snowmelt) when combined sewer collection systems become overloaded, bypass treatment works, and discharge directly to receiving waters.

**Combined Sewer System (CSS)** – A wastewater collection system that conveys sanitary wastewaters (domestic, commercial, and industrial) and storm water through a single pipe to a publicly owned treatment works for treatment prior to discharge to surface waters.

**Compliance Schedule or Schedule of Compliance**– A schedule of remedial measures included in a permit or an enforcement order, including a sequence of interim requirements (for example, actions, operations, or milestone events) that lead to compliance with an effluent limitation, other limitation, prohibition, or standard. Terms and conditions governing compliance schedules are contained in rule at 10 CSR 20-6.010(7) and 10 CSR 20-7.031(10).

**Composite Sample** – Sample composed of two or more discrete samples. The aggregate sample will reflect the average water quality covering the compositing or sample period.

**Concentration-Based Limit** – A discharge limit that is measured in units of concentration, such as milligrams per liter (mg/L).

**Conservative Pollutants** – Pollutants which are not normally physically or chemically transformed to non-toxic substances in the receiving water. These include, but are not limited to, salts and metals.

**Conventional Pollutants** – Pollutants typical of municipal sewage and for which municipal secondary treatment plants are typically designed; defined by Federal Regulation as BOD, TSS, fecal coliform bacteria, oil and grease, and pH [40 CFR §401.16].

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**Criteria** – The numeric values and the narrative standards that represent contaminant concentrations that are not to be exceeded in the receiving environmental media (surface water, ground water, sediment) to protect beneficial uses.

**Criteria Continuous Concentration (CCC)** – The four (4) day average concentration of a toxic substance or effluent that ensures adequate protection of sensitive species of aquatic organisms from chronic toxicity resulting from exposure to toxic substances or effluent. One exception to the four- (4) day averaging period are chronic criteria for total ammonia nitrogen that are thirty- (30) day average concentrations. The CCC will adequately protect the designated aquatic life use if not exceeded more than once every three (3) years. The terms “criteria continuous concentration” and “chronic criteria” are equivalent.

**Criteria Maximum Concentration (CMC)** – The maximum instantaneous or one (1) hour average concentration of a toxic substance or effluent that ensures adequate protection of sensitive species of aquatic organisms from acute toxicity resulting from exposure to toxic substances or effluent. The CMC will adequately protect the designated aquatic life use if not exceeded more than once every three (3) years. The terms “criteria maximum concentration” and “acute criteria” are equivalent.

**Daily Discharge** – The discharge of a pollutant measured during any 24-hour period that reasonably represents a calendar day for purposes of sampling. For pollutants with limitations expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged during the day. For pollutants with limitations expressed in other units of measurement (e.g. concentration) the daily discharge is calculated as the average measurement of the pollutant throughout the day [40 CFR §122.2].

**Department** – The Department of Natural Resources

**Design Flow** – Design average flow of a facility, usually expressed in million gallons per day. Facility design flow is the critical flow used for steady state modeling and water quality based effluent limit calculations.

**Designated Use or Designated Beneficial Use** – Those beneficial uses assigned to identified waters in Missouri’s Water Quality Standards (10 CSR 20-7.031, Tables G and H) whether or not the uses are being attained.

**Discharge** – When used without qualification, any spilling, leaking, emitting, escaping, leaching, or disposing of a pollutant into waters of the state.

**Discharge Monitoring Report (DMR)** – The form used by NPDES permittees to report self-monitoring results to the department. DMR data are those data reported on the discharge monitoring report that are entered into the department’s compliance database.

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**Dissolved Metal** – The form of metal capable of passing through a 0.45-micrometer filter. The analytical method is detailed in the most current version of Standard Methods for Examination of Water and Wastewater.

**Dissolved Oxygen** – The measure of the amount of oxygen dissolved in the water, usually expressed in mg/L.

**Dynamic Model** – A computer simulation model that uses real or derived time series data to predict a time series of observed or derived receiving water concentrations. Dynamic modeling methods include continuous simulation, Monte Carlo simulations, lognormal probability modeling or other similar statistical or deterministic techniques.

**E. coli (Escherichia coli)** – A common fecal and intestinal organism of the coliform group of bacteria found in warm-blooded animals. Water quality criteria for E. coli can be found in the water quality standards at 10 CSR 20-7.031, Table A.

**Existing Water Quality (EWQ)** -- A characterization of level of the pollutant of concern (POC) in a water segment on the effective date of the Antidegradation Implementation Procedure (which is the date the procedure was incorporated into rule- August 30, 2008). The EWQ shall be representative of the water quality at or immediately upstream from the point a new discharge would enter the water body, or below the point a discharge that existed before the effective date of this document enters the water body. This determination shall be made at the time the discharge is subject to an antidegradation review in accordance with the procedures in this document. Once established, EWQ is a fixed quantity/quality expressed as a concentration of a water quality parameter. For waters receiving pollutants from an existing source (where full design capacity has not been reached), the EWQ shall include the levels of pollutants already permitted to be discharged at maximum design flow.

**Effluent** – Any wastewater discharged from a treatment facility.

**Effluent Biomonitoring** – The measurement of the biological effects of effluents (e.g. toxicity, biostimulation, bioaccumulation, etc); whole effluent toxicity (WET) testing is a common example.

**Effluent Limitation** – Any restriction imposed by the department on quantities, discharge rates, and concentrations of pollutants which are discharged from point sources into waters of the state.

**Effluent Monitoring** – Any requirement imposed by the department to gather information on the physical, chemical, or biological conditions of a wastewater treatment discharge or receiving water.

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**Effluent Limitations Guidelines (ELG)** – A regulation published by the EPA Administrator under Section 304(b) of the CWA that establishes national technology-based effluent requirements for a specific industrial category.

**Environmental Protection Agency (EPA)** – The Federal regulatory agency authorized to administer the provisions of the Clean Water Act.

**Existing Use or Existing Beneficial Use** – Those beneficial uses actually attained in waters on or after November 28, 1975, whether or not they are designated for those waters in Missouri’s Water Quality Standards (10 CSR 20-7.031, Tables G and H).

**Facility Assimilative Capacity (FAC)** - The assimilative capacity applicable to an individual facility and determined through the establishment of the existing and probable pollutant concentrations at the point where the facility’s effluent enters the segment (see *Antidegradation Rule and Implementation Procedure* for more information).

**Four- (4) Day Average** – The mean of the twenty-four (24) hour average values calculated over a period of ninety-six (96) consecutive hours

**General Permit** – An NPDES permit issued under 40 CFR §122.28 that authorizes a category of discharges under the CWA within the state. A general permit is not specifically tailored for an individual discharger. Conditions and limitations from a general permit may be used in a individual, site-specific permit where BPJ suggests the conditions or limitations are necessary and more protective than those already established.

**Geometric Mean** – The geometric mean of “n” quantities is the “nth” root of the product of the quantities.

**Grab Sample** – A sample that is taken from a wastestream on a one-time basis without consideration of the flow rate of the wastestream and without consideration of time.

**Ground Water** – subsurface water comprising the zone of saturation.

**Harmonic Mean Flow** – the number of daily flow measurements divided by the sum of the reciprocals of the flows.

**Hydrologic Unit Code (HUC)** – A unique, eight-digit code that identifies a specific drainage basin (hydrologic unit) as defined by the United States Geological Survey (USGS). Hydrologic Unit Codes are used by USGS for data storage and retrieval at NWISWeb, the National Water Information System Web Site.

**Hydrologically-Based Design Flow** – A statistically derived receiving water design flow based on the selection and identification of an extreme value (e.g., 1Q10, 7Q10, 30Q10).

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The underlying assumption is that the design flow will occur a certain number of times in a certain number of years in which one or more excursions below the design flow can occur.

**LC-50** – The toxicant concentration killing fifty percent (50%) of exposed organisms at a specific time of observation (e.g. ninety-six (96) hours).

**Legal Description** – Location of a facility attribute (e.g., outfall) using the Public Land Survey System (PLSS) method of township, range, section, and quarter-section. Legal description should be established to the most accurate extent practicable and in the format quarter-section(s), section, township, and range.

**Load Allocation (LA)** – The portion of a receiving water's loading capacity that is attributed either to one or more of its existing or future nonpoint sources of pollution or to natural background sources.

**Loading Capacity or Assimilative Capacity** – The greatest amount of pollutant loading that a water can receive without violating water quality standards.

**Lowest Observed Effect Concentration (LOEC)** – The lowest concentration of a toxicant or an effluent that results in observable adverse effects in the aquatic test population.

**Major Facility** – Any NPDES facility or activity classified as such by the EPA in conjunction with the department. Major municipal dischargers include all facilities with design flows greater than one million gallons per day and facilities with EPA/State approved pretreatment programs. Major industrial facilities are determined based on specific ratings criteria developed by EPA/State.

**Mass-Based Limit** – A discharge limit that is measured in units of mass, such as pounds per day (lbs/day).

**Maximum Daily Limit (MDL)** – The highest allowable discharge value measured during a calendar day or 24-hour period representing a calendar day. A maximum daily limit is determined through a comparison of technology and water quality based effluent limitations. Where maximum daily limits are expressed in terms of mass, the daily discharge is the total mass discharge over the course of the day. Where maximum daily limits are expressed in terms of concentration, the daily discharge is the arithmetic average measurement of the pollutant concentration derived from all measurements taken that day.

**Micrograms per Liter ( $\mu\text{g/L}$ )** – Micrograms of solute per liter of solution, equivalent to parts per billion.

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**Milligrams per Liter (mg/L)** – Milligrams of solute per liter of solution, equivalent to parts per million.

**Million Gallons per Day (mgd)** – A unit of flow commonly used for wastewater discharges. One mgd is equivalent to 1.547 cubic feet per second.

**Minimum Level (ML)** - the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero.

**Mixing Zone** – An area of dilution of effluent in the receiving water beyond which chronic toxicity criteria must be met [10 CSR 20-7.031(1)(P)]. Numeric chronic criteria may be exceeded, but acute criteria, general criteria, and the whole effluent acute toxicity requirements of 10 CSR 20-7.031(3)(I) must be met at all times, except within the zone of initial dilution. The maximum size and extent of a mixing zone will depend on the low-flow condition of the receiving stream for a given criterion.

**National Pollutant Discharge Elimination System (NPDES)** – The national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 318, 402, and 405 of the Clean Water Act.

**New Source Performance Standards (NSPS)** – Technology-based standards for facilities that qualify as new sources under 40 CFR §122.2 and 40 CFR §122.29. Standards consider that the new source facility has an opportunity to design operations to more effectively control pollutant discharges.

**Non-Conservative Pollutants** – Pollutants that are transformed to non-toxic substances through physical, chemical, or biological processes in the receiving water. These include biochemical oxygen demand, ammonia, and certain other organic compounds.

**Non-Conventional Pollutants** – All pollutants that are not included in the list of conventional or toxic pollutants in 40 CFR Part 401. These include chemical oxygen demand, total organic carbon, nitrogen, and phosphorous.

**Non-Filterable Residues (NFRs)** – A measure of the filterable solids present in a sample; also referred to as total suspended solids (TSS).

**Nutrients** – The major substances necessary for the growth and reproduction of aquatic plant life, consisting of nitrogen, phosphorous, and carbon compounds.

**Outstanding National Resource Water (ONRW)** – Waters that have outstanding national recreational and ecological significance. These waters shall receive special protection against any degradation in quality. Congressionally designated rivers, including those in the Ozark national scenic riverways and the wild and scenic rivers

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system, are so designated [10 CSR 20-7.031(1)(Q)]. A list of designated ONRW can be found at 10 CSR 20-7.031, Table D.

**Outstanding State Resource Water (OSRW)** – High quality waters with a significant aesthetic, recreational or scientific value which are specifically designated as such by the Clean Water Commission [10 CSR 20-7.031(1)(R)]. A list of designated OSRW can be found at 10 CSR 20-7.031, Table E.

**pH** – A measure of the hydrogen ion concentration in water or wastewater; expressed as the negative log of the hydrogen ion concentration in mg/L. A pH of 7 is neutral, a pH less than 7 is acidic, and a pH greater than 7 is basic.

**Point Source** – Any discernible, confined and discrete conveyance including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, separate storm sewer or vessel or other floating craft from which pollutants are, or may be, discharged.

**Pollutant** - Dredged spoil, solid waste, incinerator residue, sewage, garbage, sewer sludge, munitions, chemical waste, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, filter backwash or industrial, municipal or agricultural waste discharged into water.

**Pollution** - Contamination or other alteration of the physical, chemical or biological properties of any waters of the state, including change in temperature, taste, color, turbidity or odor of the waters; or discharge of any liquid, gaseous, solid, radioactive or other substance into any waters of the state that will or is reasonably certain to create a nuisance or render the waters harmful, detrimental or injurious to 1) public health, safety or welfare, or 2) domestic, industrial, agricultural, recreational or other legitimate beneficial uses, or 3) wild animals, birds, fish or other aquatic life. In addition, this is an alteration or discharge that violates, or is reasonably certain to violate, any effluent regulations or limitations or any other standards or limitations adopted by the commission.

**Pretreatment** – The reduction of the amount of pollutants, the elimination of pollutants, or the alteration of the nature of pollutant properties in wastewater prior to or in lieu of discharging or otherwise introducing such pollutants into a publicly owned treatment works [40 CFR §403.3(q)].

**Primary Treatment** – The practice of removing some portion of the suspended solids and organic matter in a wastewater through sedimentation. Common usage of this term also includes preliminary treatment to remove wastewater constituents that may cause maintenance or operational problems in the system (i.e., grit removal, screening for rags and debris, oil and grease removal, etc.).

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**Priority Pollutants** – Those pollutants considered to be of principal importance for control under the CWA. A list of these pollutants is provided as Appendix A to 40 CFR Part 423.

**Publicly-Owned Treatment Works (POTW)** – A treatment works, as defined by Section 212 of the CWA, that is owned by the State or municipality. This definition includes any devices and systems used in the storage, treatment, recycling, and reclamation of municipal sewage or industrial wastes of a liquid nature. It also includes sewers, pipes, and other conveyances only if they convey wastewater to a POTW treatment plant [40 CFR §403.31].

**Quality Assurance Project Plan (QAPP)** - a document describing in comprehensive detail the necessary QA, QC, and other technical activities that must be implemented to ensure that the results of the work performed will satisfy the stated performance criteria.

**Receiving Waters** – Those waters that receive pollutants from point and nonpoint sources.

**Regulatory Mixing Zone** - Areas of limited size near a facility outfall where numeric water quality criteria may be exceeded, but the General Criteria found in 10 CSR 20-7.031(3) must be met. Regulatory mixing zones are limited in size (volume, area, and length) so that designated beneficial uses and aquatic communities are not adversely impacted. Missouri's Water Quality Standards contain regulatory mixing zones for both acute (zone of initial dilution) and chronic (mixing zone) conditions.

**Sanitary Sewer** - A pipe or conduit (sewer) or system of pipes and conduits (sewer) intended to carry wastewater or water-borne wastes from homes, businesses, and industries to the POTW.

**Sanitary Sewer Overflow (SSO)** – Untreated or partially treated sewage overflows from a sanitary sewer collection system.

**Secondary Treatment** – Technology-based requirements for direct discharging municipal sewage treatment facilities. Standard is based on a combination of physical and biological processes typical for the treatment of pollutants in municipal sewage. Standards are expressed as a minimum level of effluent quality in terms of: BOD<sub>5</sub>, suspended solids (SS), and pH (except as provided for special considerations and treatment equivalent to secondary treatment).

**Sewage** – The water-carried human or animal waste from residences, buildings, industrial establishments or other places, together with such ground water infiltration and surface water that may be present.

**State** – The State of Missouri.

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**Storm Sewer** - A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, manmade channels, or storm drains) that is designed or used for collecting or conveying storm water, which is not a combined sewer, and which is not part of a publicly owned treatment works. When a storm sewer system is owned by a city, town or other public body, it is commonly referred to as a municipal separate storm sewer system (MS4).

**Storm Water** – Storm water runoff, snow melt runoff, and surface runoff and drainage [40 CFR §122.26(b)(13)].

**Technology-Based Effluent Limitation** – A permit limit for a pollutant that is based on the capability of a treatment method to reduce the pollutant to a certain concentration.

**Total Maximum Daily Load (TMDL)** – The sum of individual wasteload allocations (WLAs) for point sources, load allocations (LAs) for nonpoint sources, and natural background sources. Such load shall be established at a level necessary to implement the application water quality standards with seasonal variations and a margin of safety which takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality.

**Total Recoverable Metal** – The form of metal in solution following a strong digestion procedure. This form is considered synonymous with the acid-extractable method detailed in the most current version of Standard Methods for Examination of Water and Wastewater.

**Total Suspended Solids (TSS)** – A measure of the filterable solids present in a sample; also referred to as non-filterable residues (NFRs).

**Toxic Pollutant** – Pollutants or combinations of pollutants, including disease-causing agents, which after discharge and upon exposure, ingestion, inhalation or assimilation into any organism, either directly from the environment or indirectly by ingestion through food chains, will cause death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions, (including malfunctions in reproduction) or physical deformations, in such organisms or their offspring. Toxic pollutants include, but are not limited to, the one hundred twenty-six (126) priority pollutants identified by EPA pursuant to Section 307(a) of the Federal Clean Water Act or any pollutant listed under Section 405(d) that relates to sludge management.

**Toxicity Identification Evaluation (TIE)** – A study to determine the cause of effluent toxicity.

**Toxicity Reduction Evaluation (TRE)** – A study conducted in a stepwise process designed to identify the causative agent(s) of effluent toxicity, isolate the sources of

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toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in effluent toxicity.

**Toxicity Test** – A procedure used to determine the toxicity of a chemical or an effluent using living organisms. A toxicity test measures the degree of response of an exposed test organism to a specific chemical or effluent.

**Treatment** – A process or activity conducted to remove pollutants from wastewater.

**Treatment System** – Any physical facility or land area for the purpose of collecting, treating, neutralizing, or stabilizing pollutants including treatment by disposal plants, the necessary intercepting, outfall and outlet sewers, pumping stations integral to such plants or sewers, equipment and furnishing thereof and their appurtenances. A treatment system may also be known as a treatment plant or treatment facility.

**TSD** – Abbreviation for the *Technical Support Document for Water Quality-based Toxics Control* (EPA-505/2-90-001), EPA Office of Water Enforcement and Permits, 1991. It contains procedures for water quality-based effluent limit development.

**Upset** - An exceptional incident in which there is unintentional and temporary noncompliance with the permit limit because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. See 40 CFR 122.41 (n).

**Wasteload Allocation** – The portion of a receiving water's loading capacity that is allocated to one of its existing or future point sources of pollution. It represents the maximum discharge concentration or loading of pollutant that will achieve compliance with both acute and chronic water quality criteria taking into account dilution, mixing zones, background concentrations, nonpoint sources, other discharges, and pollutant attenuation processes. Facility assimilative capacity may also be a consideration when developing a wasteload allocation.

**Wastewater** – Sewage, industrial waste, agricultural waste, and associated solids or combinations thereof, whether treated or untreated, together with such water as is present.

**Water Quality-Based Effluent Limitation (WQBEL)** – A value determined by selecting the most stringent of the effluent limits calculated using all applicable water quality criteria (e.g., aquatic life, human health, and wildlife) for a specific point source to a specific receiving water for a given pollutant.

**Water Quality Criteria** – Comprised of numeric and narrative criteria. Numeric criteria are scientifically derived ambient concentrations developed by EPA or the State for

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various pollutants of concern to protect human health and aquatic life. Narrative criteria are statements that describe the desired water quality goal.

**Water Quality Standard (WQS)** – A law or regulation that consists of the beneficial use or uses of a waterbody, the numeric and narrative water quality criteria that are necessary to protect the use or uses of that particular waterbody, and an antidegradation statement.

**Waters of the State** – All rivers, streams, lakes and other bodies of surface and subsurface water lying within or forming a part of the boundaries of the State which are not entirely confined and located completely upon lands owned, leased or otherwise controlled by a single person or by two (2) or more persons jointly or as tenants in common. These waters also include waters of the United States lying within or adjacent to the State.

**Waters of the United States** – All waters that are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters subject to the ebb and flow of the tide. Waters of the United States include but are not limited to all interstate waters and intrastate lakes, rivers, streams (including intermittent streams), mudflats, sand flats, wetlands, sloughs, prairie potholes, wet meadows, play lakes, or natural ponds. [See 40 CFR §122.2 for the complete definition.]

**Whole Effluent Toxicity** – The total toxic effect of an effluent measured directly with a toxicity test.

**Zone of Initial Dilution** – A small area of initial mixing below an effluent outfall beyond which acute toxicity criteria must be met [10 CSR 20-7.031(1)(DD)]. Numeric acute criteria may be exceeded, but general criteria must be met at all times. The maximum size and extent of a zone of initial dilution will depend on the low-flow condition of the receiving stream for a given criterion.