

**TITLE 785. OKLAHOMA WATER RESOURCES BOARD
CHAPTER 45. OKLAHOMA'S WATER QUALITY STANDARDS**

SUBCHAPTER 1. GENERAL PROVISIONS

785:45-1-2. Definitions

The following words and terms, when used in this Chapter, shall have the following meaning unless the context clearly indicates otherwise:

"Abatement" means reduction of the degree or intensity of pollution.

"Acute test failure" means greater than or equal to 50% mortality to appropriate test species at or below the critical effluent dilution after a 48 hour test as provided in OAC 252:690-3-29.

"Acute toxicity" means greater than or equal to 50% lethality to appropriate test organisms in a test sample.

"Alpha particle" means a positively charged particle emitted by certain radioactive materials. It is the least penetrating of the three common types of radiation (alpha, beta and gamma) and usually is not dangerous to plants, animals or humans.

"Ambient" means surrounding, especially of or pertaining to the environment about an entity, but undisturbed and unaffected by it.

"Aquifer" means a formation that contains sufficient saturated, permeable material to yield significant quantities of water to wells and springs. This implies an ability to store and transmit water; unconsolidated sands and gravels are typical examples.

"Aquifer Storage and Recovery Activities" ("ASR") means activities that exclusively include activities for the storage of water in and recovery of water from an aquifer pursuant to a site-specific aquifer storage and recovery plan authorized by 82 O.S. § 1020.2A. Activities not conducted pursuant to a site-specific aquifer storage and recovery plan shall not be considered ASR activities. For purposes of this chapter, ASR activities also shall not include groundwater recharge or augmentation through a natural connection with a farm pond or other impoundment otherwise authorized by law.

"Artificial Aquifer Recharge" means activities with the primary purpose of recharging or augmenting an aquifer with no intention of recovering such water for future use. For purposes of this chapter, Artificial Aquifer Recharge activities shall not include activities specifically authorized pursuant to 82 O.S. § 1020.2(G) or stormwater runoff management practices otherwise authorized by law.

"Assimilative capacity" means the amount of pollution a waterbody can receive and still maintain the water quality standards designated for that waterbody.

"Attainable uses" means the best uses achievable for a particular waterbody given water of adequate quality. The process of use attainability analysis can, and in certain cases must, be used to determine attainable uses for a waterbody.

"Background" means the ambient condition upstream or upgradient from a facility, practice or activity which has not been affected by that facility, practice or activity.

"BCF" means bioconcentration factor.

"Beneficial uses" means a classification of the waters of the State, according to their best uses in the interest of the public.

"Benthic macroinvertebrates" means invertebrate animals that are large enough to be seen by the unaided eye, can be retained by a U. S. Standard No. 30 sieve, and live at least part of their life cycles within or upon available substrate in a body of water or water transport system.

"Best Available Technology" means the best proven technology, treatment techniques or other economically viable means which are commercially available.

"Best management practices" means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the state or United States. BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

"Beta particle" means a negatively charged elementary particle emitted by radioactive decay that may cause skin burns. It is easily stopped by a thin sheet of metal.

"Bioconcentration factor" means the relative measure of the ability of a contaminant to be stored in tissues and thus to accumulate through the food chain and is shown as the following formula: $BCF = \text{Tissue Concentration} \text{ divided by } \text{Water Concentration}$.

"BMPs" means best management practices.

"Board" means Oklahoma Water Resources Board.

"BOD" means biochemical oxygen demand.

"Carcinogenic" means cancer producing.

"Chronic test failure" means the statistically significant difference (at the 95% confidence level) between survival, reproduction or growth of the test organism at or below the chronic critical dilution after completion of a 7 day test as provided in OAC 252:690-3-29, or other test as approved by the permitting authority and the EPA Regional Administrator, and a control.

"Chronic toxicity" means a statistically significant difference (at the 95% confidence level) between longer-term survival and/or reproduction or growth of the appropriate test organisms in a test sample and a control. Teratogenicity and mutagenicity are considered to be effects of chronic toxicity.

"Coliform group organisms" means all of the aerobic and facultative anaerobic gram-negative, non-spore-forming rod shaped bacteria that ferment lactose broth with gas formation within 48 hours at 35°C.

"Color" means true color as well as apparent color. True color is the color of the water from which turbidity has been removed. Apparent color includes not only the color due to substances in solution (true color), but also that color due to suspended matter.

"Conservative element" means a substance which persists in the environment, having characteristics which are resistant to ordinary biological or chemical degradation or volatilization.

"Conservation plan" means, but is not limited to, a written plan which lists activities, management practices and maintenance or operating procedures designed to promote natural resource conservation and is intended for the prevention and reduction of pollution of waters of the state.

"Critical dilution" means, for chronic whole effluent toxicity testing, an effluent dilution expressed as a percentage representative of the dilution afforded a wastewater discharge according to the appropriate Q^* -dependent chronic mixing zone equation.

"Critical temperature" means the higher of the seven-day maximum temperature likely to occur with a 50% probability each year, or 29.4°C (85°F).

"Criterion" means a number or narrative statement assigned to protect a designated beneficial use.

"CWAC" means Cool Water Aquatic Community.

"Degradation" means any condition caused by the activities of humans which result in the prolonged impairment of any constituent of the aquatic environment.

"Designated beneficial uses" means those uses specified for each waterbody or segment whether or not they are being attained.

"Dissolved oxygen" means the amount of oxygen dissolved in water at any given time, depending upon the water temperature, the partial pressure of oxygen in the atmosphere in contact with the water, the concentration of dissolved organic substances in the water, and the physical aeration of the water.

"DO" means dissolved oxygen.

"DRASTIC" means that standardized system developed by the United States Environmental Protection Agency for evaluating groundwater vulnerability to pollution, based upon consideration of depth to water (D), net recharge (R), aquifer media (A), soil media (S), topography (T), impact of the vadose zone media (I), and hydraulic conductivity (C) of the aquifer.

"EPA" means the United States Environmental Protection Agency.

"Ephemeral stream" means an entire stream which flows only during or immediately after a rainfall event, and contains no refuge pools capable of sustaining a viable community of aquatic organisms.

"Epilimnion" means the uppermost homothermal region of a stratified lake.

"Eutrophication" means the process whereby the condition of a waterbody changes from one of low biologic productivity and clear water to one of high productivity and water made turbid by the accelerated growth of algae.

"Existing beneficial uses" means those uses listed in Title 40 CFR §131.3 actually attained by a waterbody on or after November 28, 1975. These uses may include public water supplies, fish and wildlife propagation, recreational uses, agriculture, industrial water supplies, navigation, and aesthetics.

"Existing point source discharge(s)" means, for purposes of 785:45-5-25, point source discharges other than stormwater which were/are in existence when the ORW, HQW, SWS, or SWS-R designation was/is assigned to the water(s) which receive(s) the discharge. The load from a point source discharge which is subject to the no increase limitation shall be based on the permitted mass loadings and concentrations, as appropriate, in the discharge permit effective when the limitation was assigned. Publicly owned treatment works may use design flow, mass loadings or concentration as appropriate if those flows, loadings or concentrations were approved as a portion of Oklahoma's Water Quality Management Plan prior to the application of the ORW, HQW, SWS, or SWS-R limitation.

"Fecal coliform" means a group of organisms common to the intestinal tracts of humans and of animals. The presence of fecal coliform bacteria in water is an indicator of pollution and of potentially dangerous bacterial contamination.

"Fresh groundwater" means groundwater with naturally-occurring concentrations of total dissolved solids less than 10,000 mg/L, or with levels of total dissolved solids of 10,000 or more mg/L caused by human activities.

"Geometric mean" means the nth root of the product of the samples.

"Groundwater" means waters of the state under the surface of the earth regardless of the geologic structure in which it is standing or moving outside the cut bank of any definite stream. [82: 1020.1(A)]

"Groundwater basin" means a distinct underground body of water overlain by contiguous land and having substantially the same geological and hydrological characteristics and yield capabilities". [82: 1020.1(C)]

"HLAC" means Habitat Limited Aquatic Community.

"HQW" means High Quality Water.

"HUC" means hydrologic unit code utilized by the United States Geologic Survey and other federal and state agencies as a way of identifying all drainage basins in the United States in a nested arrangement from largest to smallest, consisting of a multi-digit code which identifies each of the levels of classification within two-digit fields.

"Intolerant climax fish community" means habitat and water quality adequate to support game fishes or other sensitive species introduced or native to the biotic province or ecological region, which require specific or narrow ranges of high quality environmental conditions.

"Lake" means:

(A) An impoundment of waters of the state over 50 acre-feet in volume which is either:

- (i) owned or operated by federal, state, county, or local government or
- (ii) appears in Oklahoma's Clean Lakes Inventory.

(B) Surface impoundments which are used as a treatment works for the purpose of treating stabilizing or holding wastes are excluded from this definition.

"LC50" means lethal concentration and is the concentration of a toxicant in an external medium that is lethal to fifty percent of the test animals for a specified period of exposure.

"Long-term average flow" means an arithmetic average stream flow over a representative period of record.

"MDL" means the Method Detection Limit and is defined as the minimum concentration of an analyte that can be measured and reported with 99% confidence that the analyte concentration is greater than zero (0). MDL is dependent upon the analyte of concern.

"Mixing zone" means when a liquid of a different quality than the receiving water is discharged into the receiving water, a mixing zone is formed. Concentration of the liquid within the mixing zone decreases until it is completely mixed with receiving water. A regulatory mixing zone is described in 785:45-5-26.

"Narrative criteria" means statements or other qualitative expressions of chemical, physical or biological parameters that are assigned to protect a beneficial use.

"Natural source" means source of contamination which is not human induced.

"NLW Impairment Study" means a scientific process of surveying the chemical, physical and biological characteristics of a nutrient threatened reservoir to determine whether the reservoir's beneficial uses are being impaired by human-induced eutrophication.

"Non-conservative element" means a substance which undergoes significant short-term degradation or change in the environment other than by dilution.

"Nonpoint source" means a source of pollution without a well defined point of origin.

"Normal stream flow conditions" means flow corresponding to low gradient areas in the hydrograph.

"**NTU**" means Nephelometric Turbidity Unit, which is the unit of measure using the method based upon a comparison of the intensity of light scattered by the sample under defined conditions with the intensity of light scattered by a standard reference suspension (formazin). The higher the intensity of scattered light, the higher the turbidity.

"**Numerical criteria**" means concentrations or other quantitative measures of chemical, physical or biological parameters that are assigned to protect a beneficial use.

"**Numerical standard**" means the most stringent of the numerical criteria assigned to the beneficial uses for a given stream.

"**Nutrient impaired reservoir**" means a reservoir with a beneficial use or uses determined by an NLW Impairment Study to be impaired by human-induced eutrophication.

"**Nutrient-limited watershed**" means a watershed of a waterbody with a designated beneficial use which is adversely affected by excess nutrients as determined by Carlson's Trophic State Index (using chlorophyll-a) of 62 or greater, or is otherwise listed as "NLW" in Appendix A of this Chapter.

"**Nutrients**" means elements or compounds essential as raw materials for an organism's growth and development; these include carbon, oxygen, nitrogen and phosphorus.

"**ORW**" means Outstanding Resource Water.

"**OWRB**" means Oklahoma Water Resources Board.

"**PCBs**" means polychlorinated biphenyls.

"**Picocurie**" means that quantity of radioactive material producing 2.22 nuclear transformations per minute.

"**Point source**" means any discernable, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, well, discrete fissure, container, rolling stock or concentrated animal feeding operation from which pollutants are or may be discharged. This term does not include return flows from irrigation agriculture.

"**Pollutant**" means any material, substance or property which may cause pollution.

"**Pollution**" means contamination or other alteration of the physical, chemical or biological properties of any natural waters of the State, or such discharge of any liquid, gaseous or solid substance into any waters of the State as will or is likely to create a nuisance or render such waters harmful, or detrimental or injurious to public health, safety or welfare, or to domestic, commercial, industrial, agricultural, recreational, or other legitimate beneficial uses, or to livestock, wild animals, birds, fish or other aquatic life". [82: §1084.2(1)]

"**Polychlorinated biphenyls**" means a group of organic compounds (206 possible) which are constructed of two phenyl rings and more than one chlorine atom.

"**PQL**" means Practical Quantitation Limit and is defined as 5 times the MDL. The PQL represents a practical and routinely achievable detection limit with high confidence.

"**Put and take fishery**" means the introduction of a fish species into a body of water for the express purpose of sport fish harvest where existing conditions preclude a naturally reproducing population.

"**Q***" means dilution capacity.

"**Salinity**" means the concentration of salt in water.

"**Sample standard**" means the arithmetic mean of historical data from October 1976 to September 1983 except as otherwise provided in Appendix F of this Chapter, plus two standard deviations of the mean.

"**Seasonal base flow**" means the sustained or fair-weather runoff, which includes but is not limited to groundwater runoff and delayed subsurface runoff.

"Seasonal seven-day, two-year low flow" means the 7-day low flow of a stream likely to occur with a 50% probability for a season with the applicable dates in Table 1 of Appendix G of OAC 785:45.

"Seasonal 7Q2" means the seasonal seven-day, two-year low flow.

"Sensitive representative species" means *Ceriodaphnia dubia*, *Daphnia magna*, *Daphnia pulex*, *Pimphales promelas* (Fathead minnow), *Lepomis macrochirus* (Bluegill sunfish), or other sensitive organisms indigenous to a particular waterbody.

"SWS" means Sensitive Public and Private Water Supply.

"SWS-R" means waterbodies classified as sensitive public and private water supplies that may be augmented with reclaimed water for the purpose of indirect potable reuse.

"Seven-day, two-year low flow" means the 7-day low flow of a stream likely to occur with a 50% probability each year.

"7Q2" means the seven-day, two-year low flow.

"Standard deviation" means a statistical measure of the dispersion around the arithmetic mean of the data.

"Standard Methods" means the publication "Standard Methods for the Examination of Water and Wastewater", published jointly by the American Public Health Association, American Water Works Association, and Water Environment Federation.

"Standards", when capitalized, means this Chapter, which constitutes the Oklahoma Water Quality Standards described in 82 O.S. §1085.30. Whenever this term is not capitalized or is singular, it means the most stringent of the criteria assigned to protect the beneficial uses designated for a specified water of the State.

"Storm water" means storm water runoff, snow melt runoff, and surface runoff and drainage.

"Subwatershed" means a smaller component of the larger watershed.

"Synergistic effect" means the presence of cooperative pollutant action such that the total effect is greater than the sum of the effects of each pollutant taken individually.

"Thermal pollution" means degradation of water quality by the introduction of heated effluent and is primarily a result of the discharge of the cooling waters from industrial processes, particularly from electrical power generation.

"Thermal stratification" means horizontal layers of different densities produced in a lake caused by temperature.

"Variance" means a temporary (not to exceed three years) exclusion of a specific numerical criterion for a specific discharge to a specific waterbody.

"Warm Water Aquatic Community" means a subcategory of the beneficial use category "Fish and Wildlife Propagation" where the water quality and habitat are adequate to support intolerant climax fish communities and includes an environment suitable for the full range of warm water benthos.

"Wastes" means industrial waste and all other liquid, gaseous or solid substances which may pollute or tend to pollute any waters of the state". [82 O. S. §1084.2(2)]

"Waterbody" means any specified segment or body of waters of the state, including but not limited to an entire stream or lake or a portion thereof.

"Water quality" means physical, chemical, and biological characteristics of water which determine diversity, stability, and productivity of the climax biotic community or affect human health.

"Waters of the state" means all streams, lakes, ponds, marshes, watercourses, waterways, wells, springs, irrigation systems, drainage systems, and all other bodies or accumulations of water, surface and underground, natural or artificial, public or private, which are contained within, flow through, or border upon this State or any portion thereof [82:1084.2(3)].

"Watershed" means the drainage area of a waterbody including all direct or indirect tributaries.

"WWAC" means Warm Water Aquatic Community.

"Yearly mean standard" means the arithmetic mean of historical data from October 1976 to September 1983 except as otherwise provided in Appendix F of this Chapter, plus one standard deviation of the mean. The moving yearly mean standard is an average of the last five years of available data.

"Zone of passage" means a three dimensional zone expressed as a volume in the receiving stream through which mobile aquatic organisms may traverse the stream past a discharge without being affected by it. A regulatory zone of passage is described in 785:45-5-26.

SUBCHAPTER 7. GROUNDWATER QUALITY STANDARDS

Section

785:45-7-1. Scope and Applicability; Purpose

785:45-7-2. ~~Criteria for Groundwater Protection and Corrective Actions~~ Groundwater Quality Antidegradation Policy

785:45-7-3. Groundwater Classifications, beneficial uses and vulnerability levels

785:45-7-4. Criteria for Groundwater Quality Protection

785:45-7-5. Corrective Action

785:45-7-1. Scope and Applicability; Purpose

- (a) The provisions of this Subchapter apply only to fresh groundwater.
- (b) The purposes of the rules in this Subchapter are to protect beneficial uses and classifications of groundwater, to assure that degradation of the existing quality of groundwater does not occur, and to provide minimum standards for remediation when groundwater becomes polluted by humans.
- (c) Implementation provisions for groundwater quality standards are locations in 785:46-13.

785:45-7-2. ~~Criteria for Groundwater Protection and Corrective Actions~~Groundwater Quality Antidegradation Policy

(a) ~~Criteria for protection of groundwater quality.~~ The groundwaters of the state of Oklahoma are an important and valuable resource that shall be maintained and protected.

(1) ~~The groundwaters of the state shall be maintained to prevent alteration of their chemical properties by harmful substances not naturally found in groundwater.~~

(2) ~~Protective measures adequate to preserve and protect background quality of the groundwater and existing and designated groundwater basin classifications shall be maintained at all times. Protective measures shall also be sufficient to minimize the impact of pollutants on groundwater quality. The concentration of any synthetic substance or any substance not naturally occurring in that location shall not exceed the PQL in an unpolluted groundwater sample using laboratory technology. If the concentration found in the test~~

sample exceeds the PQL, or if other substances in the groundwater are found in concentrations greater than those found in background conditions, that groundwater shall be deemed to be polluted and corrective action may be required.

~~(3) Measures to prevent noncompliance with this Section caused by any person shall be the responsibility of each state environmental agency within their jurisdictional areas of environmental responsibility. Such measures shall be prescribed in the Water Quality Standards Implementation Plan of each such agency. When regulating activities that have the potential to contaminate groundwater from the surface, state environmental agencies shall consider the vulnerability level of an affected hydrogeologic basin (for example, more stringent measures such as siting limitations, lagoon liners, or additional monitoring wells may be required to protect groundwater in hydrogeologic basins with High or Very High vulnerability levels).~~

(b) Beneficial uses shall be maintained and protected and human degradation of groundwater quality that would cause or contribute to the nonattainment of beneficial uses shall not be allowed.

(c) Whenever existing groundwater quality exceeds the level necessary for beneficial uses to be maintained and protected, the existing groundwater quality shall be maintained and protected, unless it is demonstrated to the State that any lowering of groundwater quality:

- (1) After an analysis of alternatives, is necessary to accommodate important economic and social development and is in the public interest; and
- (2) Protective measures sufficient to protect beneficial uses shall be maintained at all times.

(d) In certain groundwaters, whenever existing groundwater quality exceeds the level necessary for beneficial uses to be maintained and protected, the existing groundwater quality shall be maintained and protected.

(1) Special Source Groundwaters

(A) Special source groundwaters are defined as groundwaters where exceptional water quality exists, where there is an irreplaceable source of water, where it is necessary to maintain an outstanding resource, or where the quality of the groundwater may be important for maintaining a uniquely designated characteristic of certain surface waters, as defined in i-iv below:

- i. All groundwater likely to influence the quality of waters designated as a "Scenic River" in Appendix A of this Chapter and their watersheds; and
- ii. All groundwater likely to influence the quality of waters located within the boundaries of the areas described in Appendix B of this Chapter; and
- iii. All groundwater likely to influence the quality of waters designated as "HQW" in Appendix A of this Chapter; and
- iv. All groundwater likely to influence the quality of waters located within the boundaries of a State approved source water protection area for public water supply.

(B) Groundwaters designated as special source groundwaters are prohibited from receiving any discrete discharge(s), surface water from constructed

infiltration basins, or surface application of waste, unless the activity maintains or improves existing water quality.

- (C) Discharges proximate and/or adjacent to special source groundwaters shall take into consideration the requirement to maintain or improve existing water quality in special source groundwaters and shall ensure that any activity provides for the maintenance or improvement of water quality in special source groundwaters

785:45-7-3. Groundwater Classifications, beneficial uses and vulnerability levels

(a) **Classifications.** Classification of all groundwater shall be designated as follows:

(1) **(Class I): RESERVED (Special Source Groundwater):** ~~Special source groundwaters are defined as groundwaters where exceptional water quality exists, where there is an irreplaceable source of water, where it is necessary to maintain an outstanding resource or where the groundwater is ecologically important. Special source groundwaters are considered to be very vulnerable to contamination. This classification shall include:~~

~~(A) All groundwater located underneath the watersheds of waterbodies designated "Scenic River" in Appendix A of this Chapter;~~

~~(B) Special source groundwater located underneath lands located within the boundaries of the areas described in Appendix B of this Chapter; and~~

~~(C) All groundwater located underneath lands located within the boundaries of a State approved wellhead or source water protection area for public water supply.~~

(2) **Class II (General Use Groundwater) (Class II):** These are groundwaters which have good quality due to natural conditions capable of being used as a drinking water supply with no treatment or with conventional treatment methods, which have the potential to be used for other beneficial uses and which and generally have a mean concentration of total dissolved solids of less than 3,000 milligrams per liter.

(3) **Class III (Limited Use Groundwater) (Class III):** These are groundwaters which have poor quality due to natural conditions and which could require extensive treatment for use as a source of drinking water, and which generally have a mean concentration of total dissolved solids of greater than or equal to 3000 milligrams per liter but less than 5000 milligrams per liter.

(4) **Class IV (Highly Mineralized Treatable Groundwater) (Class IV):** These are groundwaters which have very poor quality due to natural conditions and which would require extensive treatment for use as a source of drinking water, and which generally have a mean concentration of total dissolved solids of greater than or equal to 5000 milligrams per liter but less than 10,000 milligrams per liter.

(b) **Beneficial uses.** This subsection lists the various beneficial uses of groundwater and designates certain beneficial uses for certain classifications of groundwater.

(1) **List of beneficial uses for groundwater.**

(A) **Public and Private Water Supply.** The beneficial use designation of Public and Private Water Supply refers to those groundwaters capable of delivering suitable quantities of fresh groundwater for municipal or domestic consumption whether or not treatment is required.

(B) **Domestic Untreated Water Supply.** The beneficial use designation of Domestic Untreated Water Supply refers to those groundwaters capable of delivering suitable quantities of untreated groundwater for domestic consumption.

(BC) **Agriculture.** The beneficial use designation of Agriculture refers to that groundwater which is or could be used for irrigation or livestock watering.

(CD) **Industrial and Municipal Process and Cooling Water.** The beneficial use designation of Industrial and Municipal Process and Cooling Water refers to that groundwater that is or could be used for a municipal or industrial process or cooling function.

(2) **Beneficial use designations.**

(A) The beneficial uses for General Use Groundwater (Class II), Class I and Class II groundwater not identified in Appendix H of this Chapter, shall be Domestic Untreated Water Supply, Public and Private Water Supply, Agriculture, and Industrial and Municipal Process and Cooling Water.

(B) The beneficial uses for Limited Use Groundwater (Class III) and Highly Mineralized Treatable Groundwater (Class IV) Class III and Class IV groundwater, not identified in Appendix H of this Chapter, shall be Agriculture and Industrial and Municipal Process and Cooling Water.

(C) The beneficial uses for any groundwater identified in Appendix H of this Chapter shall be as designated in that appendix.

(D) The beneficial use for groundwater which is used for domestic water supply purposes on or after July 1, 2000, has a mean concentration of total dissolved solids of less than 30005000 milligrams per liter, and has not been determined by any state environmental agency to be not suitable for human consumption, shall be Public Water Supply and or Domestic Untreated Water Supply ~~Public and Private Water Supply.~~

(E) A beneficial use designation for groundwater may be amended or removed only after a demonstration to the satisfaction of the Board that meets one of the following tests:

(i) The designated use does not exist due to a condition that was not caused by humans, and treatment using Best Available Technology will not achieve the designated use, or

(ii) The designated use does not exist due to a condition that is attributable to irreversible impacts caused by humans, and the remedy would cause substantial and widespread economic and social impact.

(F) Groundwater which has had a beneficial use designation amended or removed pursuant to (E) of this paragraph shall be identified in Appendix H of this Chapter.

(c) **Vulnerability level.** Groundwater in certain hydrogeologic basins is further classified according to its vulnerability to contamination as determined by DRASTIC. Such vulnerability levels of hydrogeologic basins shall be identified as Very Low, Low, Moderate, High, and Very High as prescribed in Table 1 of Appendix D of this Chapter. The vulnerability level may vary within each hydrogeologic basin, depending on site-specific hydrogeologic factors.

(d) **Nutrient-vulnerable groundwater.** Certain specified groundwaters shall be further subject to designation in Table 2 of Appendix D of this Chapter as nutrient-vulnerable groundwater.

785:45-7-4. Criteria for groundwater quality protection

(a) Groundwaters of the state support many different beneficial uses. The criteria below do not require improvement over naturally occurring background concentrations. When naturally

occurring background concentrations exceed the criterion for a given parameter, the naturally occurring background concentration may be utilized as a criterion, if suitable. If a given parameter has more than one criterion associated with it, the most stringent criteria shall apply to ensure beneficial use protection.

(b) The following criteria apply to all groundwaters for the protection of beneficial uses. Where specific numeric criteria for any constituent of concern have not been adopted, narrative criteria may be translated, in a scientifically defensible manner, into numeric endpoints applicable in state environmental agency regulatory and or corrective action programs.

(1) Microorganisms. In groundwaters with the designated or existing use of Public Water Supply and Domestic Untreated Water Supply microorganisms shall not exceed the limits specified in 40 CFR 141.63 and 40 CFR 141.70-73. These provisions are incorporated by reference into this rule; this incorporation by reference is prospective including future changes to the incorporated provisions as the changes take effect.

(2) Taste and Odor. Groundwaters shall be free from taste and odor producing substances, in concentrations that cause nuisance or adversely affect any beneficial use.

(3) Chemical Constituents. Groundwaters shall not contain chemical constituents in concentrations that adversely affect any beneficial use.

(4) Radioactivity. At a minimum, groundwaters designated Public Water Supply and Domestic Untreated Water Supply shall not contain concentrations of radionuclides in excess of limits specified in 40 CFR 141.66. This provision is incorporated by reference into this rule; this incorporation by reference is prospective including future changes to the incorporated provisions as the changes take effect.

(5) Toxicity. Groundwaters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life associated with any beneficial use(s). This criterion applies regardless of whether the toxicity is caused by a single substance or the interactive effect of multiple substances or the mobilization and or transformation of a substance due to changes in physiochemical properties within the aquifer.

(6) Geochemical and Physical Composition. The geochemical and physical composition of groundwaters shall not be altered such that mobilization of any introduced or in-situ contaminants, natural or non-natural, occurs and impairs any beneficial use.

(7) Minerals. Increased mineralization, in comparison to existing water quality, from elements such as, but not limited to, calcium, magnesium, sodium and their associated anions shall not impair any beneficial use.

(c) For artificial aquifer recharge and or aquifer storage and recovery activities, the criteria below and presented in Tables 1 and 2 shall also apply to ensure the protection of the public water supply and the domestic untreated water supply beneficial uses. Artificial recharge and or aquifer storage and recovery activities shall not cause or contribute to a condition of pollution or nuisance or result in nonattainment of any applicable groundwater quality standard.

(1) Chemical Constituents. At a minimum, groundwaters shall not contain concentrations of chemical constituents in excess of the maximum contaminant levels specified in the following provisions:

(A) Organic Contaminants in 40 CFR 141.61(a)

(B) Synthetic Organic Contaminants in 40 CFR 141.61(c)

(C) Inorganic Contaminants in 40 CFR 141.62(b)

(D) Disinfection Byproducts in 40 CFR 141.64

(E) Disinfectants in 40 CFR 141.65(a)

(2) Toxicity. At a minimum, groundwaters shall not exceed limits specified in Table 1 of this subchapter.

Table 1. Numerical criteria to protect the Public Water Supply and Domestic Untreated Water Supply beneficial uses.

| <u>Parameter</u> | <u>CAS #</u> | <u>Criteria (ug/L, unless otherwise noted)</u> |
|--|------------------|--|
| <u>Nickel</u> | <u>7440020</u> | <u>140</u> |
| <u>Acrolein</u> | <u>107028</u> | <u>3.5</u> |
| <u>Acrylonitrile</u> | <u>107131</u> | <u>0.65</u> |
| <u>Aldrin</u> | <u>309002</u> | <u>0.021</u> |
| <u>Chloroform</u> | <u>67663</u> | <u>70</u> |
| <u>4,4''-DDD</u> | <u>72548</u> | <u>1.5</u> |
| <u>4,4'-DDT</u> | <u>50293</u> | <u>1</u> |
| <u>Dichlorobromomethane</u> | <u>75274</u> | <u>5.6</u> |
| <u>Dieldrin</u> | <u>60571</u> | <u>0.022</u> |
| <u>Perchlorate</u> | <u>7601-90-3</u> | <u>4.9</u> |
| <u>Phenol</u> | <u>108952</u> | <u>4,200</u> |
| <u>Bis(2-ethylhexyl)phthalate (BEHP)</u> | <u>117817</u> | <u>25</u> |
| <u>Butylbenzyl phthalate</u> | <u>85687</u> | <u>1,400</u> |
| <u>Diethyl Phthalate</u> | <u>84662</u> | <u>5,600</u> |
| <u>Dimethyl Phthalate</u> | <u>131113</u> | <u>70,000</u> |
| <u>Di-n-Butyl Phthalate</u> | <u>84742</u> | <u>700</u> |

(3) Secondary Contaminants. At a minimum, groundwaters shall not exceed the criteria limits presented in Table 2 of this subchapter and consistent with 40 CFR 143.3. This provision for the parameters listed below is incorporated by reference into this rule; this incorporation by reference is prospective including future changes to the incorporated provisions as the changes take effect.

Table 2. Secondary drinking water contaminants and associated criteria as listed in 40 CFR 143.3.

| <u>Parameter</u> | <u>Criteria</u> |
|-----------------------|-----------------------|
| <u>Aluminum</u> | <u>0.05 mg/L</u> |
| <u>Color</u> | <u>15 color units</u> |
| <u>Corrosivity</u> | <u>Non-corrosive</u> |
| <u>Copper</u> | <u>1.0 mg/L</u> |
| <u>Fluoride</u> | <u>2.0 mg/L</u> |
| <u>Foaming Agents</u> | <u>0.5 mg/L</u> |

| | |
|-------------------------------------|--------------------------------------|
| <u>Iron</u> | <u>0.3 mg/L</u> |
| <u>Manganese</u> | <u>0.05 mg/L</u> |
| <u>Odor</u> | <u>3 TON (threshold odor number)</u> |
| <u>pH</u> | <u>6.5 – 8.5</u> |
| <u>Silver</u> | <u>0.1 mg/L</u> |
| <u>Chloride</u> | <u>250 mg/L</u> |
| <u>Sulfate</u> | <u>250 mg/L</u> |
| <u>Total Dissolved Solids (TDS)</u> | <u>500 mg/L</u> |
| <u>Zinc</u> | <u>5.0 mg/L</u> |

(d) Measures to prevent noncompliance with this Section caused by any person, or activity, shall be the responsibility of each state environmental agency within their jurisdictional areas of environmental responsibility. Such measures shall be prescribed in the Water Quality Standards Implementation Plan of each such agency. When regulating activities that have the potential to contaminate groundwater from the surface, state environmental agencies shall consider the vulnerability level of an affected hydrogeologic basin (for example, more stringent measures such as siting limitations, lagoon liners, or additional monitoring wells may be required to protect groundwater in hydrogeologic basins with High or Very High vulnerability levels). When regulating groundwater quality activities that have the potential to cause or contribute to impairment of a surface water beneficial use, state environmental agencies shall include provisions to prevent the impairment of any surface water beneficial use.

785:45-7-5. Corrective Action

(a) Groundwater that has been polluted as a result of human activities shall be restored to a quality that will support the beneficial uses designated in OAC 785:45-7-3 for that groundwater, or as otherwise specified in a site-specific remediation plan approved by an agency of competent jurisdiction.

(b) Measures to remedy, control or abate groundwater pollution caused by any person shall be the responsibility of each state environmental agency within its jurisdictional areas. Such measures shall be prescribed in the Water Quality Standards Implementation Plan of each such agency. When regulating activities that have the potential to contaminate groundwater from the surface, state environmental agencies shall consider the vulnerability level of an affected hydrogeologic basin (for example, more stringent measures such as siting limitations, lagoon liners, or additional monitoring wells may be required to protect groundwater in hydrogeologic basins with High or Very High vulnerability levels).