Presented below are water quality standards that are in effect for Clean Water Act purposes.

EPA is posting these standards as a convenience to users and has made a reasonable effort to assure their accuracy. Additionally, EPA has made a reasonable effort to identify parts of the standards that are not approved, disapproved, or are otherwise not in effect for Clean Water Act purposes.

SOUTH CAROLINA DEPARTMENT OF
HEALTH AND ENVIRONMENTAL CONTROL

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PROMOTE PROTECT PROSPER

R.61-68, *WATER CLASSIFICATIONS & STANDARDS*

Effective June 27, 2014
(This version replaces and supercedes any former versions of the regulation.)

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DISCLAIMER
This copy of the regulation is provided by the Department for the convenience of the public. Every effort has been made to ensure its accuracy; however, it is not the official text. The Department reserves the right to withdraw or correct this text if deviations from the official text, as published in the State Register, are found.

PREAMBLE

Pursuant to South Carolina Code Sections 48-1-10, et seq. of the 1976 South Carolina Code of Laws, the Department of Health and Environmental Control shall promulgate regulations to implement the Pollution Control Act. R. 61-68, *Water Classifications and Standards*, establish appropriate classified water uses to be achieved and protected, establish general rules and specific water quality criteria to protect classified and existing water uses, establish antidegradation rules, protect the public health and welfare, and maintain and enhance water quality. The water quality standards also serve as a basis for decision making in other water quality program areas. National Pollutant Discharge Elimination System (NPDES) permit limitations for waste discharges are based upon the classifications and water quality standards of the receiving waters. This regulation also governs the control of toxic substances, thermal discharges, stormwater discharges, dredge and fill activities, and other water related activities.

In accordance with Section 303(c) of the Clean Water Act and 40 CFR 131, the United States Environmental Protection Agency (EPA) has approved these water quality standards on June 22, 2015, for purposes of implementation of the Act.

Regulation History

Promulgated pursuant to South Carolina Code Section 48-1-10 et seq.

Added by Document No. 2572 in S.C. State Register 25-6, effective June 22, 2001

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A. PURPOSE AND SCOPE.

1. These regulations, promulgated pursuant to authority in the S. C. Pollution Control Act, Section 48-1-10 et seq., 1976 Code of Laws, establish a system and rules for managing and protecting the quality of South Carolina's surface and ground water. They establish the State's official classified water uses for all waters of the State, establish general rules and specific numeric and narrative criteria for protecting classified and existing water uses, and establish procedures for classifying waters of the State. The water quality standards include the uses of the waters, the numeric and narrative criteria, and the antidegradation rules contained in this regulation.

    a. The uses of the waters of the State are defined and described in Sections B, C, E, F, G, and H of this regulation.

    b. Numeric criteria for aquatic life and human health are numeric values for specific parameters and pollutants or water quality levels which have been assigned for the protection of the existing and classified uses for each of the classifications in South Carolina and are listed in Section D, E, G, H, and the Appendix. Narrative criteria for aquatic life and human health are general goals and statements of attainable or attained conditions of biological integrity and water quality of the waterbody. These narrative criteria rely upon the use of standardized measures and data analyses to make qualitative determinations of the water quality and use attainment. The Department uses scientifically sound and, where applicable, EPA-approved methods in making these determinations. Narrative criteria are listed in Sections C, D, E, F, G, and H.

    c. Antidegradation rules provide a minimum level of protection to all waters of the State and also include provisions and requirements necessary to determine when and if water quality degradation is allowed. Antidegradation rules are described in Section D of this regulation.

2. Waters which meet standards shall be maintained. Waters which do not meet standards shall be improved, wherever attainable, to achieve those standards. However, the Department cannot assure that classified waters shall at all times meet the numeric water quality standards for such uses.

3. Recognizing the technical and economic difficulty in restoring water quality, the Department shall emphasize a preventive approach in protecting waters of the State.

4. It is a goal of the Department to maintain and improve all surface waters to a level to provide for the survival and propagation of a balanced indigenous aquatic community of flora and fauna and to provide for recreation in and on the water. It is also a goal to provide, where appropriate and desirable, for drinking water after conventional treatment, shellfish harvesting, and industrial and agricultural uses.

5. It is a goal of the Department to maintain or restore ground water quality so it is suitable as a drinking water source without any treatment.

B. DEFINITIONS.

1. The definition of any word or phrase employed in this regulation shall be the same as given in the South Carolina Pollution Control Act, 48-1-10, et seq, S.C. Code of Laws, 1976, hereafter referred to as the Act. Words or phrases which are not defined in the Act are defined as follows:

2. **7Q10** means the annual minimum seven day average flow rate that occurs with an average frequency of once in ten years as published or verified by the U. S. Geological Survey (USGS) or an estimate extrapolated from published or verified USGS data.

3. **30Q5** means the annual minimum thirty day average flow rate that occurs with an average frequency of once in five years as published or verified by the U. S. Geological Survey (USGS) or an estimate extrapolated from published or verified USGS data.

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

5. **Acute-to-chronic ratio** (ACR) means the ratio of the acute toxicity of an effluent or a toxicant to its chronic toxicity. It is used as a factor for estimating chronic toxicity on the basis of acute toxicity data, or for estimating acute toxicity on the basis of chronic toxicity data.

6. **Agricultural** means the use of water for stock watering, irrigation, and other farm purposes.

7. **Annual average flow** means the annual mean flow rate of a stream at a specific point as published or verified by the U. S. Geological Survey (USGS) or an estimated annual mean flow rate extrapolated from published or verified USGS data.

8. **Aquaculture** means a defined managed water area which uses discharges of pollutants into that designated area for the maintenance or production of harvestable freshwater, estuarine, or marine plants or animals.

9. **Aquatic farm** means the cultivation, production, or marketing of domestic aquatic organisms which are any fish, aquatic invertebrates, or aquatic plants that are spawned, produced, or marketed as a cultivated crop in the waters of the State.

10. **Aquatic toxicity test** mean laboratory experiments that measure the biological effect (e.g., growth, survival, and reproduction) of effluents or receiving waters on aquatic organisms.

11. **Aquifer** means a geologic formation, group of formations, or part of a formation that contains sufficient saturated permeable material to yield significant quantities of ground water to wells or springs.

12. **Balanced indigenous aquatic community** means a natural, diverse biotic community characterized by the capacity to sustain itself through cyclic seasonal changes, presence of necessary food chain species and by a lack of domination by pollutant tolerant species.

13. **Best management practice** (BMP) means a practice or combination of practices that are the most effective, practical ways of controlling or abating pollution from widespread or localized sources.

14. **Bioaccumulation** means the process by which a compound is taken up and retained by an aquatic organism, both from water and through food.

15. **Bioavailability** means a measure of the physiochemical access that a toxicant has to the biological processes of an organism. The less the bioavailability of a toxicant, the less its toxic effect on an organism.

16. **Bioconcentration** means the process by which a compound is absorbed from water through gills or epithelial tissues and is concentrated in the body.

17. **Bioconcentration factor** (BCF) means the ratio of a substance's concentration in tissue versus its concentration in water, in situations where the food chain is not exposed or represents equilibrium partitioning between water and organisms.

18. **Biological assessment** means an evaluation of the biological condition of a waterbody using biological surveys and other direct measurements of resident biota in surface waters and sediments.

19. **Biological criteria**, also known as biocriteria, mean narrative expressions or numeric values of the biological characteristics of aquatic communities based on appropriate reference conditions. Biological criteria serve as an index of aquatic community health.

20. **Biological monitoring**, also known as biomonitoring, means a description of the living organisms in water quality surveillance used to indicate compliance with water quality standards or permit effluent limits and to document water quality trends. Methods of biological monitoring may include, but are not limited to, toxicity testing such as ambient toxicity testing, whole effluent toxicity testing, and ambient assessment of the resident biological community.

21. **Chlorophyll *a*** means a photosynthetic pigment present in all types of green plants. It is used as a measure of algal biomass and is an indicator of nutrient enrichment.

22. **Chronic means** a stimulus that lingers or continues for a relatively long period of time, often one-tenth 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.

23. **Classified uses** means those uses specified in Section G for surface waters and Section H for ground waters, whether or not those uses are being attained.

24. **Concentrated aquatic animal production facility** means a hatchery, fish farm, or other facility related to aquatic animal production which is not located in waters of the State and is subject to a National Pollutant Discharge Elimination System (NPDES) permit.

25. **Conventional treatment** as applying to potable water supplies means treatment including at least flocculation, sedimentation, filtration, and disinfection.

26. **Criterion continuous concentration** (CCC) means the highest instream concentration of a toxicant or an effluent to which the organisms can be exposed to protect against chronic (long-term) effects. EPA derives chronic criteria from longer term (often greater than 28 days) tests that measure survival, growth, reproduction, and in some cases bioconcentration.

27. **Criterion maximum concentration** (CMC) means the highest instream concentration of a toxicant or an effluent to which the organisms can be exposed for a brief period of time without causing an acute effect. EPA derives acute criteria from 48 to 96 hour tests of lethality or immobilization.

28. **Daily average** means the average of all samples taken during any 24 hour period.

29. **Daily maximum (for bacterial indicators only)** means the highest arithmetic average of bacterial samples collected [for each of the bacterial indicator species (i.e., *E. coli*, enterococci, and /or fecal coliform)] in any 24 hour period during a calendar month.

30. **Deleterious substances** mean those substances which in sufficient concentrations or levels have a harmful effect on classified or existing water uses.

31. **Ecoregions** mean areas of general similarity in ecosystems and in the type, quality, and quantity of environmental resources and are designed to serve as a spatial framework for the research, assessment, management, and monitoring of ecosystems and ecosystem components. The EPA has published a document that outlines the Level III ecoregions (please refer to U.S. Environmental Protection Agency. 1999. Level III ecoregions of the continental United States (revision of Omernik, 1987). Corvallis, Oregon, U.S. E.P.A.-National Health and Environmental Effects Research Laboratory, Map M-1.) The following are South Carolina Level III ecoregions: Blue Ridge Mountains, Piedmont, Southeastern Plains, and Middle Atlantic Coastal Plains.

32. **Ephemeral streams** mean streams that generally have defined natural watercourses that flow only in direct response to rainfall or snowmelt and in which discrete periods of flow persist no more than 29 consecutive days per event.

33. **Existing uses** means those uses actually being attained in or on the water, on or after November 28, 1975, regardless of the classified uses.

34. **Fishing** means the taking, harvesting, or catching of finfish or crustaceans for human consumption.

35. **Full pool elevation** means the maximum lake level attained before water releases over a fixed weir, spillway, or other discharge structure. In larger lakes and reservoirs, the full pool elevation is the maximum level established for management.

36. **Groundwater** means water below the land surface in a zone of saturation.

37. **Hydrograph controlled release** (HCRs) means the onsite storage or holding of treated wastewater or the use of an alternative discharge option contained in Section D.2.a. of this regulation, during specified critical streamflow conditions and then discharging the treated wastewater to the stream when streamflow is sufficient to assimilate the wastewater.

38. **Intermittent streams** means streams that generally have defined natural watercourses which do not flow year around, but flow beyond periods of rainfall or snowmelt.

39. **Lake** means any water of the State that is a freshwater pond, reservoir, impoundment, or similar body of water located wholly or partially within the State.

40. **LC_{50}** means the concentration of a toxicant at which lethality occurs to 50 percent of the test organisms during a specified exposure time period.

41. **Mixing zone** means:

    a. For surface waters, an area where a discharge undergoes initial dilution and is extended to cover the secondary mixing in the ambient waterbody. A mixing zone is an allocated impact zone where water quality criteria can be exceeded as long as acutely toxic conditions are prevented (except as defined within a Zone of initial dilution) and public health and welfare are not endangered.

    b. For ground waters, a hydrogeologically controlled three-dimensional flow path in the subsurface which constitutes the pathway for waste constituents to migrate from a source.

42. **Monthly average (for bacterial indicators only)** means the calendar month (i.e., 28 days, 29 days, 30 days, or 31 days) geometric mean of all bacterial samples collected [for each of the bacterial indicator species (i.e., *E. coli*, enterococci, and/or fecal coliform)] during that calendar month.

43. **Natural conditions** mean those water quality conditions unaffected by anthropogenic sources of pollution.

44. **No discharge zone** (NDZ) means a waterbody (or a portion of a waterbody) so designated that no discharging Marine Sanitation Devices (MSDs) are allowed on vessels on waterbodies so designated. All vessels located on such designated waterbodies shall be equipped with MSDs which discharge to a holding tank which shall be pumped out at a

designated pump-out location or shall discharge legally outside the boundary of the United States.

45. **No observed effect concentration** (NOEC) means the highest tested concentration of an effluent or a toxicant at which no adverse effects are observed on the aquatic test organisms at a specific time of observation and determined using hypothesis testing.

46. **Nutrients** mean an element or chemical essential to life including, but not limited to, nitrogen and phosphorus.

47. **Organoleptic** effects mean those sensory effects associated with taste and smell.

48. **Outstanding recreational or ecological resource waters** means waters which are of exceptional recreational or ecological importance or of unusual value. Such waters may include, but are not limited to: waters in national or state parks or wildlife refuges; waters supporting threatened or endangered species; waters under the National Wild and Scenic Rivers Act or South Carolina Scenic Rivers Act; waters known to be significant nursery areas for commercially important species or known to contain significant commercial or public shellfish resources; or waters used for or having significant value for scientific research and study.

49. **Practical quantitation limit** (PQL) means a concentration at which the entire analytical system must give a recognizable signal and acceptable calibration point. It is the concentration in a sample that is equivalent to the concentration of the lowest calibration standard analyzed by a specific analytical procedure, assuming that all the method-specific sample weights volumes, and processing steps have been followed.

50. **Prohibited area** means an area adjacent to point source discharges or other sources of potential contamination in shellfish growing waters where the gathering of clams, mussels, or oysters is prohibited to protect public health.

51. **Primary contact recreation** means any activity with the intended purpose of direct water contact by the human body to the point of complete submergence, including but not limited to swimming, water skiing, and skin diving.

52. **Propagation** means the continuance of species through reproduction and growth in the natural environment, as opposed to the maintenance of species by artificial culture and stocking.

53. **Public water system** means any public or privately owned waterworks system which provides drinking water for human consumption, except those serving a single private residence or dwelling.

54. **Recharge area** means an area where an underground source of drinking water is poorly confined, is under water table conditions, and has a downward component of flow from the water table into the underground source of drinking water.

55. **Secondary contact recreation** means any activity occurring on or near the water which does not have an intended purpose of direct water contact by the human body to the point of complete submergence, including but not limited to fishing, boating, canoeing, and wading.

56. **Shellfish** mean bivalve mollusks, specifically clams, mussels, or oysters.

57. **Shellfish harvesting** means taking of bivalve mollusks, specifically clams, mussels, or oysters, for direct marketing or human consumption.

58. **Source for drinking water supply** means any source of surface water which is used for domestic consumption, or used in connection with the processing of milk, beverages, food or for other purposes which required finished water meeting regulations (40 CFR Part 141 and 40 CFR Part 143) established pursuant to the Safe Drinking Water Act (Public Law 93-523, 95-190) applicable to public water systems.

59. **Tidal conditions** mean conditions determined by the Department as appropriate for tidally influenced waters of the State to be analogous to the 7Q10 or the annual average flow for flowing waters of the State.

60. **Tidal saltwaters** means those waters whose elevation is subject to changes due to oceanic tides and which have chloride ion content in excess of 250 milligrams per liter (mg/l) (salinity = 0.48 parts per thousand).

61. **Toxic wastes** means those wastes or combinations of wastes including disease-causing agents which, discharge and upon exposure, ingestion, inhalation, or assimilation into any organism, either directly from the environment or indirectly by ingestion through food chains, may cause death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions (including malfunctions in reproduction), physical deformations, or restrict or impair growth in such organisms or their offspring.

62. **Underground source of drinking water** (USDW) means an aquifer or its portion:

    a. Which supplies any public water system or individual residential well; or

    b. Which contains a sufficient quantity of ground water to supply a public water system or individual residential well; and,

    (1) Currently supplies drinking water for human consumption; or
    (2) Contains water with less than ten thousand milligrams per liter total dissolved solids.

63. **Variance** means a short-term exemption from meeting certain otherwise applicable water quality standards.

64. **Water table** means that level below the land surface at which all the voids are filled with water at a pressure equal to atmospheric.

65. **Weekly average** means the average of all samples taken during any consecutive seven day period.

66. **Whole effluent toxicity** (WET) means the aggregate toxic effect of an aqueous sample measured directly by an aquatic toxicity test.

67. **Zone of initial dilution** (ZID) means that minimal area of a mixing zone immediately surrounding the outfall where water quality criteria are not met, provided there is no acute toxicity to drifting organisms and public health and welfare are not endangered.

C. APPLICABILITY OF STANDARDS.

1. The water quality standards are applicable to both surface waters and ground waters.

2. Any exception specified in this regulation is to be applied exclusively to the situation for which it was incorporated and not as a general rule applicable to all situations or waters of the State.

3. Uses in all waters shall be protected, wherever attainable, regardless of flow and classification of waters.

4. Critical flows for determining permit effluent limitations and/or permit conditions or requirements, including permit development such as wasteload allocations or load allocations in TMDL's, will be calculated in accordance with the following:

   a. Aquatic life numeric criteria.

   (1) The applicable critical flow conditions for aquatic life criteria shall be defined as 7Q10 or tidal conditions as determined by the Department. The numeric criteria of this regulation are not applicable to waters of the State when the flow rate is less than 7Q10 except as prescribed below.

   (2) The Department shall consider conditions that are comparable to or more stringent than 7Q10 where appropriate to protect classified and existing uses, such as below dams and in tidal situations. Only those situations where the use of 7Q10 flows are determined to be impracticable, inappropriate, or insufficiently protective of aquatic life uses shall be considered as a situation in which the Department may consider other flow conditions.

   (3) NPDES Permit conditions shall be based on a critical condition analysis (e.g., critical flow, temperature or pH, or a combination of factors which would represent a critical conditions). Regarding ambient water temperature as a component of a critical condition analysis, the Department may consider less stringent limits during November through February based on a critical ambient water temperature during November through February.

b. Human health and organoleptic numeric criteria.

(1) The applicable critical flow conditions for human health shall be defined as annual average flow for carcinogens, 7Q10 (or 30Q5 if provided by the applicant) for noncarcinogens, or tidal conditions as determined by the Department. The applicable critical flow conditions for organoleptic criteria shall be defined as annual average flow or tidal conditions as determined by the Department. The numeric criteria of this regulation are not applicable to waters of the State when the flow rate is less than the annual average flow for carcinogens or 7Q10 (or 30Q5 if provided by the applicant) for noncarcinogens, except as prescribed below.

(2) The Department shall consider conditions that are comparable to or more stringent than annual average flow, 7Q10, or 30Q5 (if provided by the applicant) where appropriate to protect the classified and existing uses, such as below dams and in tidal situations. Only those situations where the use of annual average flow, or 7Q10, or 30Q5 (if provided by the applicant) are determined to be impracticable, inappropriate, or insufficiently protective of human health uses shall be considered as a situation in which the Department may consider other flow conditions.

c. As described below, the Department may also consider conditions other than 7Q10 for use with an HCR.

(1) After a complete antidegradation review in compliance with Section D.2., an HCR for oxygen-demanding substances may be permitted by the Department for the following situations:

i. If other flow-related effluent conditions are allowed by federal effluent guidelines as specified in 40 CFR Parts 400 499 (Chapter I, Subchapter N) and when used the numeric criteria shall not be exceeded and all water quality standards are maintained and protected;

ii. For industrial discharges, after application of advanced wastewater treatment, as determined by the Department, for the type of wastewater discharged;

iii. For other discharges, after application of advanced wastewater treatment which will be defined, for this purpose, at or below the following permit effluent limitations of BOD_5 = 10 mg/l, NH_3-N = 1 mg/l, and DO = 6 mg/l.

(2) In cases where an HCR may be allowed, the permit effluent limitations for toxics will not be variable and will be based on the critical flow conditions (chemical-specific or WET).

(3) In cases where an HCR may be allowed, new or proposed expansions of existing permits shall require instream biological assessments and existing permits may require instream biological assessments.

5. Intermittent streams and ephemeral streams shall be considered waters of the State. The water quality standards of the class of the stream to which intermittent and ephemeral streams are tributary shall apply, disregarding any site-specific numeric criteria for the named waterbody. This does not preclude the development of site-specific numeric criteria for intermittent and ephemeral streams.

6. The standards of adjacent waters must be maintained in basins excavated from high ground and constructed solely for berthing vessels. The standards of the adjacent waters must also be maintained with regard to impacts from created marina basins.

7. The existing and classified uses of downstream waters shall be maintained and protected and existing uses shall be protected regardless of the classification of the downstream waters. In tidally-influenced waters, the existing and classified uses of both upstream and downstream waters shall be maintained and protected and the existing uses shall be protected regardless of the classification of the upstream and downstream waters.

8. Where surface waters are not classified by name (unlisted) in R.61-69, Classified Waters, the water quality standards of the class of the stream to which they are tributary shall apply, disregarding any site specific numeric criteria for the named waterbody. In tidal areas where an unlisted tributary may affect or flows between two differently classified waterbodies, regardless of whether the location is upstream or downstream, the more stringent numeric criteria of the classified waters apply to the unlisted tributary, disregarding any site-specific numeric criteria for those waterbodies. This does not preclude the development of site-specific numeric criteria for unlisted tributaries.

9. Because of natural conditions some surface and ground waters may have characteristics outside the standards established by this regulation. Such natural conditions do not constitute a violation of the water quality standards; however, degradation of existing water quality is prohibited unless consistent with Section D.4. of this regulation.

10. A mixing zone for surface waters may be allowed by the Department. All water quality standards of the classification of the surface waters, including affected downstream waters, are applicable unless a mixing zone, setting forth certain conditions, is granted by the Department. When the Department grants a mixing zone, the mixing zone shall not be an area of waste treatment nor shall it interfere with or impair the existing uses of the waterbody. The size of the mixing zone shall be minimized, as determined by the Department, and shall be based upon applicable critical flow conditions. Since mixing zones are allocated impact zones where human health and aquatic life numeric criteria can be exceeded, the Department shall restrict their use. The following prohibitions and restrictions are established in order to support these important uses of the waters of the State.

    a. In order to protect human health, mixing zones are not allowed when: they would endanger public health and welfare, the mixing zone would adversely affect shellfish harvesting, or the mixing zone would be for bacteria (e.g. fecal coliform).

b. In order to protect aquatic life, mixing zones are not allowed when: a pollutant, excluding temperature or thermal, in a discharge would attract biota; the mixing zone would result in undesirable aquatic organisms or a dominance of nuisance species outside of the mixing zone; there is a reasonable expectation that a discharge would adversely affect a federally-listed endangered or threatened aquatic species, its habitat, or a proposed or designated critical habitat; the mixing zone would not allow safe passage of aquatic organisms when passage would otherwise be unobstructed; or the mixing zone would not allow for the protection and propagation of a balanced indigenous aquatic community in and on the water body.

c. In order to protect both human health and aquatic life, mixing zones are not allowed when: a discharge would not be predicted to or does not produce adequate mixing at the point of discharge; or a discharge would be to a waterbody where multiple discharges interact if the combined mixing zone would impair the waterbody outside the mixing zone. The Department may prohibit or limit mixing zones in waters of the State that may be considered a significant estuarine nursery habitat for resident species.

d. The size of the mixing zone shall be kept to a minimum and may be determined on an individual project basis considering biological, chemical, engineering, hydrological, and physical factors.

11. Mixing zones for ground waters may be allowed by the Department. In order to ensure the maintenance and protection of the uses of the waters of the State and in compliance with Section D of this regulation, any mixing zone granted by the Department shall be determined on an individual basis by the Department as prescribed below.

a. The numeric standards for Class GB ground water, Section H.9., are applicable unless a mixing zone solely within the bounds of the property, setting forth certain conditions, is granted by the Department. Such a mixing zone shall be granted upon satisfactory demonstration to the Department that:

(1) Reasonable measures have been taken or binding commitments are made to minimize the addition of contaminants to ground water and/or control the migration of contaminants in ground water;

(2) The ground water in question is confined to a shallow geologic unit which has little or no potential of being an Underground Source of Drinking Water, and discharges or will discharge to surface waters without contravening the surface water standards set forth in this regulation;

(3) The contaminant(s) in question occurs within the bounds of the property, and there is minimum possibility for ground water withdrawals (present or future) to create drawdown such that contaminants would flow off-site; and

(4) The contaminants or combination of contaminants in question are not dangerously toxic, mobile, or persistent.

b. [Reserved].

12. Site-specific numeric criteria for surface waters may be established by the Department to replace the numeric criteria of Sections E, G, and the appendix of this regulation or to add new numeric criteria not contained in this regulation. Establishment of such numeric criteria shall be subject to public participation and administrative procedures for adopting regulations. In addition, such site-specific numeric criteria shall not apply to tributary or downstream waters unless specifically described in the water classification listing R.61-69, Classified Waters.

13. In classifying and adopting standards for the waters of the State, the Department considers:

    a. The size, depth, surface area covered, volume, flow direction, rate of flow, stream gradient and temperature of the water;

    b. The character of the district bordering such water and its suitability for the uses and with a view to conserving it and encouraging the most appropriate use of the lands bordering on such water for residential, agricultural, industrial, or recreational purposes;

    c. The uses which have been made, are being made, may be made or are desired to be made of such waters for transportation, domestic, and industrial consumption, irrigation, swimming, fishing, fish culture, fire prevention, sewage disposal or other uses;

    d. The present quality of such waters; and

    e. Information, about the four items above, from government agencies, interested groups, and the public.

D. ANTIDEGRADATION RULES.

1. Existing water uses and the level of water quality necessary to protect these existing uses shall be maintained and protected regardless of the water classification and consistent with the policies below.

    a. A new activity or expansion of an existing activity shall not be allowed in Class ONRW, Class ORW, or Shellfish Harvesting Waters if it would exclude, through establishment of a prohibited area, an existing shellfish harvesting or culture use. A new activity or expansion of an existing activity which will result in a prohibited area may be allowed in Class SA or Class SB waters when determined to be appropriate by the Department and would not remove or impair an existing use.

    b. Existing uses and water quality necessary to protect these uses are presently affected or may be affected by instream modifications or water withdrawals. The stream flows necessary to protect classified and existing uses and the water quality supporting these uses shall be maintained consistent with riparian rights to reasonable use of water.

c. Existing or classified ground water uses and the conditions necessary to protect those uses shall be maintained and protected.

2. Where surface water quality exceeds levels necessary to support propagation of fish, shellfish, and wildlife, and recreation in and on the water, that quality shall be maintained and protected unless the Department finds, after intergovernmental coordination and public participation, that allowing lower water quality is necessary to important economic or social development in the areas where the waters are located. In allowing such lower water quality, water quality adequate to fully protect existing and classified uses shall be maintained. The highest statutory and regulatory requirements for all new and existing point sources shall be achieved and all cost-effective and reasonable best management practices for nonpoint source control shall be achieved within the State's statutory authority and otherwise encouraged. In order to fulfill these goals, the Department shall consider (a) and (b) below when evaluating any proposed expansion or new discharge to waters of the State that will lower water quality to a measurable effect. This includes, but is not limited to, the new or increased loading of any pollutant or pollutant parameter in the effluent regardless of whether the discharge flow changes.

a. An alternatives analysis, conducted by the applicant, must demonstrate to the Department that none of the following applicable alternatives that would minimize or eliminate the lowering of water quality are economically and technologically reasonable:

(1) Water recycle or reuse;
(2) Use of other discharge locations;
(3) Connection to other wastewater treatment facilities;
(4) Use of land application;
(5) Product or raw material substitution;
(6) Any other treatment option or alternative.

b. After the alternatives analysis is completed, the Department shall evaluate whether a proposed discharge that will result in the lowering of water quality of a waterbody, and for which there are no economically or technologically reasonable alternatives, is necessary for important economic or social development. For this to be accomplished, several economic and social factors must be considered. If an evaluation of the economic and social factors reveals that affordable treatment options that, combined with any alternatives, would prevent the need for the lowering of water quality, the Department shall deny the request. Conformance of the proposed discharge with the applicable '208 Areawide Water Quality Management Plans may demonstrate importance to economic and social development as well as intergovernmental coordination and public participation. Activities requiring permits or certification by the Department shall provide for public participation through the Department's existing public notification processes. Economic and social factors to be considered may include the following:

(1) Employment (increases, maintenance, or avoidance of reduction);
(2) Increased industrial production;

(3) Improved community tax base;
(4) Improved housing; and/or
(5) Correction of an environmental or public health problem.

3. The water quality of outstanding resource surface waters designated as Class ONRW or Class ORW shall be maintained and protected through application of the standards for these classifications as described in Section G.

4. Certain natural conditions may cause a depression of dissolved oxygen in surface waters while existing and classified uses are still maintained. The Department shall allow a dissolved oxygen depression in these naturally low dissolved oxygen waterbodies as prescribed below pursuant to the Act, Section 48-1-83, et seq., 1976 Code of Laws:

   a. For purposes of section D of this regulation, the term "naturally low dissolved oxygen waterbody" is a waterbody that, between and including the months of March and October, has naturally low dissolved oxygen levels at some time and for which limits during those months shall be set based on a critical condition analysis. The term does not include the months of November through February unless low dissolved oxygen levels are known to exist during those months in the waterbody. For a naturally low dissolved oxygen waterbody, the quality of the surface waters shall not be cumulatively lowered more than 0.1 mg/l for dissolved oxygen from point sources and other activities; or

   b. Where natural conditions alone create dissolved oxygen concentrations less than 110 percent of the applicable water quality standard established for that waterbody, the minimum acceptable concentration is 90 percent of the natural condition. Under these circumstances, an anthropogenic dissolved oxygen depression greater than 0.1 mg/l shall not be allowed unless it is demonstrated that resident aquatic species shall not be adversely affected pursuant to Section 48-1-83. The Department may modify permit conditions to require appropriate instream biological monitoring.

   c. The dissolved oxygen concentrations shall not be cumulatively lowered more than the deficit described above utilizing a daily average unless it can be demonstrated that resident aquatic species shall not be adversely affected by an alternate averaging period.

E. General Rules and Standards Applicable to All Waters.

1. The General Assembly of South Carolina in the Act has declared the following policy: "It is declared to be the public policy of the State to maintain reasonable standards of purity of the air and water resources of the State, consistent with the public health, safety and welfare of its citizens, maximum employment, the industrial development of the State, the propagation and protection of terrestrial and marine fauna and flora, and the protection of physical property and other resources. It is further declared that to secure these purposes and the enforcement of the provisions of this Act, the Department of Health and Environmental Control shall have authority to abate, control and prevent pollution."

2. The classes and standards described in Section G and H of this regulation implement the above State policy by protecting the waters of South Carolina. Consistent with the above policy, the Department adopts the following general standards in items 3-17 for all waters of South Carolina.

3. No waters of the State shall be used for the sole or principal purpose of transporting or treating wastes.

4. a. Any discharge into waters of the State must be permitted by the Department and receive a degree of treatment and/or control which shall produce an effluent which is consistent with the Act, the Clean Water Act (P.L. 92-500, 95-217, 97-117, 100-4), this regulation, and related regulations. No permit issued by the Department shall be interpreted as creating any vested right in any person. Additionally, any discharge into waters of the State containing sanitary wastes shall be effectively disinfected as necessary to meet the appropriate standards of this regulation. The Department may require best management practices (BMPs) for control of stormwater runoff as part of the requirements of an NPDES permit, a State construction permit, or a State 401 Water Quality Certification.

   b. When not specifically covered by permit reporting requirements, any unauthorized discharge into waters of the State which may cause or contribute to an excursion of a water quality standard must be reported by the responsible party to the Department orally within 24 hours of becoming aware of such conditions. Further, written notification must be provided to the Department (Bureau of Water) within five (5) days of becoming aware of such conditions and the written notice must include the following:

   (1) A description of the discharge and cause;

   (2) The duration of the discharge, including exact dates and times, and if not corrected, the time that the unauthorized discharge is expected to cease, and what steps are being taken to eliminate, minimize, and prevent recurrence of the discharge.

5. All ground waters and surface waters of the State shall at all times, regardless of flow, be free from:

   a. Sewage, industrial waste, or other waste that will settle to form sludge deposits that are unsightly, putrescent, or odorous to such degree as to create a nuisance, or interfere with classified water uses or existing water uses;

   b. Floating debris, oil, grease, scum, and other floating material attributable to sewage, industrial waste, or other waste in amounts sufficient to be unsightly to such a degree as to create a nuisance or interfere with classified water uses or existing water uses;

   c. Sewage, industrial, or other waste which produce taste or odor or change the existing color or physical, chemical, or biological conditions in the receiving waters or aquifers to such a degree as to create a nuisance, or interfere with classified water uses (except

classified uses within mixing zones as described in this regulation) or existing water uses; and,

d. High temperature, toxic, corrosive, or deleterious substances attributable to sewage, industrial waste, or other waste in concentrations or combinations which interfere with classified water uses (except classified uses within mixing zones as described in this regulation), existing water uses, or which are harmful to human, animal, plant or aquatic life.

6. Waters where classified uses are not being attained can be reclassified for protection of an attainable use and standards designated for that use where:

   a. Natural conditions prevent the attainment of the use; or

   b. Natural, ephemeral, intermittent, low flow conditions, or water levels prevent the attainment of the use; or

   c. Human caused conditions or sources prevent the attainment of the use and cannot be remedied or would cause more environmental damage to correct than to leave in place; or

   d. Dams, diversions, or other types of hydrologic modifications preclude the attainment of the use, and it is not feasible to restore the waterbody to its original condition or to operate such modification in a way that would result in the attainment of the use; or

   e. Physical conditions related to the natural features of the water body, such as the lack of a proper substrate, cover, flow, depth, pools, riffles, and the like, preclude attainment of aquatic life protection uses; or

   f. Controls more stringent than those required by Sections 301(b) and 306 of the Clean Water Act would result in substantial and widespread economic and social impact.

7. Before the Department may grant a variance for any water of the State, there must be a demonstration that one of the following factors for reclassifying uses has been satisfied:

   a. Natural conditions prevent the attainment of the use; or

   b. Natural, ephemeral, intermittent, low flow conditions, or water levels prevent the attainment of the use; or

   c. Human caused conditions or sources prevent the attainment of the use and cannot be remedied or would cause more environmental damage to correct than to leave in place; or

   d. Dams, diversions, or other types of hydrologic modifications preclude the attainment of the use, and it is not feasible to restore the waterbody to its original condition or to operate such modification in a way that would result in the attainment of the use; or

e. Physical conditions related to the natural features of the water body, such as the lack of a proper substrate, cover, flow, depth, pools, riffles, and the like, preclude attainment of aquatic life protection uses; or

f. Controls more stringent than those required by Sections 301(b) and 306 of the Clean Water Act would result in adverse social and economic impact, disproportionate to the benefits to the public health, safety or welfare as a result of maintaining the standard.

8. If the demonstration necessary under Section E.7 above has been satisfied, the Department may then grant a variance provided the following apply:

   a. The variance is granted to an individual discharger for a specific pollutant(s) or parameter(s) and does not otherwise modify water quality standards; and

   b. The variance identifies and justifies the criterion that shall apply during the existence of the variance; and

   c. The variance is established as close to the underlying criterion as is possible and upon expiration of the variance, the underlying criterion shall become the effective water quality standard for the waterbody; and

   d. The variance is reviewed every three years, at a minimum, and extended only where the conditions for granting the variance still apply; and

   e. The variance does not exempt the discharger from compliance with any applicable technology or other water quality-based permit effluent limitations; and

   f. The variance does not affect permit effluent limitations for other dischargers.

9. Prior to removing any uses or granting a variance, notice and an opportunity for a public hearing shall be provided.

10. Discharge of fill into waters of the State is not allowed unless the activity is consistent with Department regulations and will result in enhancement of classified uses with no significant degradation to the aquatic ecosystem or water quality.

11. In order to protect and maintain lakes and other waters of the State, consideration needs to be given to the control of nutrients reaching the waters of the State. Therefore, the Department shall control nutrients as prescribed below.

    a. Discharges of nutrients from all sources, including point and nonpoint, to waters of the State shall be prohibited or limited if the discharge would result in or if the waters experience growths of microscopic or macroscopic vegetation such that the water quality standards would be violated or the existing or classified uses of the waters would be impaired. Loading of nutrients shall be addressed on an individual basis as necessary to ensure compliance with the narrative and numeric criteria.

b. Numeric nutrient criteria for lakes are based on an ecoregional approach which takes into account the geographic location of the lakes within the State and are listed below. These numeric criteria are applicable to lakes of 40 acres or more. Lakes of less than 40 acres will continue to be protected by the narrative criteria.

(1) For the Blue Ridge Mountains ecoregion of the State, total phosphorus shall not exceed 0.02 mg/l, chlorophyll *a* shall not exceed 10 ug/l, and total nitrogen shall not exceed 0.35 mg/l.

(2) For the Piedmont and Southeastern Plains ecoregions of the State, total phosphorus shall not exceed 0.06 mg/l, chlorophyll *a* shall not exceed 40 ug/l, and total nitrogen shall not exceed 1.50 mg/l.

(3) For the Middle Atlantic Coastal Plains ecoregion of the State, total phosphorus shall not exceed 0.09 mg/l, chlorophyll *a* shall not exceed 40 ug/l, and total nitrogen shall not exceed 1.50 mg/l.

c. In evaluating the effects of nutrients upon the quality of lakes and other waters of the State, the Department may consider, but not be limited to, such factors as the hydrology and morphometry of the waterbody, the existing and projected trophic state, characteristics of the loadings, and other control mechanisms in order to protect the existing and classified uses of the waters.

d. The Department shall take appropriate action, to include, but not limited to: establishing numeric effluent limitations in permits, establishing Total Maximum Daily Loads, establishing waste load allocations, and establishing load allocations for nutrients to ensure that the lakes attain and maintain the above narrative and numeric criteria and other applicable water quality standards.

e. The criteria specific to lakes shall be applicable to all portions of the lake. For this purpose, the Department shall define the applicable area to be that area covered when measured at full pool elevation.

12. a. The water temperature of all Freshwaters which are free flowing shall not be increased more than 5ºF (2.8ºC) above natural temperature conditions and shall not exceed a maximum of 90ºF (32.2ºC) as a result of the discharge of heated liquids unless a different site-specific temperature standard as provided for in C.12. has been established, a mixing zone as provided in C.10. has been established, or a Section 316(a) determination under the Federal Clean Water Act has been completed.

b. The weekly average water temperature of all Shellfish Harvesting, Class SA and Class SB waters shall not exceed 4ºF (2.2ºC) above natural conditions during the fall, winter or spring, and shall not exceed 1.5ºF (0.8ºC) above natural conditions during the summer as a result of the discharge of heated liquids unless a different site-specific temperature standard as provided for in C.12. has been established, a mixing zone as provided for in

C.10. has been established, or a Section 316(a) determination under the Federal Clean Water Act has been completed.

c. The weekly average water temperature of all Freshwaters which are lakes shall not be increased more than 5ºF (2.8ºC) above natural conditions and shall not exceed 90ºF (32.2ºC) as a result of the discharge of heated liquids unless a different site-specific temperature standard as provided for in C.12. has been established, a mixing zone as provided in C.10. has been established, or a Section 316(a) determination under the Federal Clean Water Act has been completed.

13. Numeric criteria based on organoleptic data (prevention of undesirable taste and odor) are adopted herein. Those substances and their criteria are listed in the appendix. For those substances which have aquatic life and/or human health numeric criteria and organoleptic numeric criteria, the most stringent of the three shall be used for derivation of permit effluent limitations.

14. Numeric criteria for the protection and maintenance of all classes of surface waters are adopted herein and are listed in Sections E, G, and the appendix. Footnotes that further describe the application of these numeric criteria are included in the appendix.

a. Application of numeric criteria to protect aquatic life.

(1) The stated CMC value shall be used as an acute toxicity number for calculating permit effluent limitations.

(2) The stated CCC value shall be used as a chronic toxicity number for calculating permit effluent limitations.

(3) If metals concentrations for numeric criteria are hardness-dependent, the CMC and CCC concentrations shall be based on 25 milligrams/liter (mg/l) hardness (as expressed as $CaCO_3$) if the ambient hardness is less than 25 mg/l. Concentrations of hardness less than 400 mg/l maybe based on the actual mixed stream hardness if it is greater than 25 mg/l and less than 400 mg/l and 400 mg/l if the ambient hardness is greater than 400 mg/l.

(4) If separate numeric criteria are given for fresh and salt waters, they shall be applied as appropriate. In transitional tidal and estuarine areas, the Department shall apply the more stringent of the criteria to protect the existing and classified uses of the waters of the State.

(5) The Department shall review new or revised EPA criteria for adoption by South Carolina when published in final form.

(6) If the State develops site-specific criteria for any substances for which EPA has developed national criteria, the site-specific criteria shall supersede the national criteria.

b. Application of numeric criteria to protect human health.

(1) If separate numeric criteria are given for organism consumption, water and organism consumption (W/O), and drinking water Maximum Contaminant Levels (MCLs), they shall be applied as appropriate. The most stringent of the criteria shall be applied to protect the existing and classified uses of the waters of the State.

(2) The Department shall review new or revised EPA criteria for adoption by South Carolina when published in final form by EPA.

(3) If the State develops site-specific criteria for any substances for which EPA has developed national criteria, the site-specific criteria shall supersede the national criteria.

(4) Adoption of EPA human health criteria does not preclude the Department from considering health effects of other pollutants or from considering new or revised EPA criteria when developing effluent permit conditions.

c. Application of criteria for the derivation of permit effluent limitations.

(1) Numeric criteria for substances listed in Sections E, G, and the appendix shall be used by the Department to derive NPDES permit effluent limitations at the applicable critical flow conditions as determined by the Department unless an exception is provided below.

(2) When the derived permit effluent limitation based on aquatic life numeric criteria is below the practical quantitation limit for a substance, the derived permit effluent limitation shall include an accompanying statement in the permit that the practical quantitation limit using approved analytical methods shall be considered as being in compliance with the limit. Appropriate biological monitoring requirements shall be incorporated into the permit to determine compliance with appropriate water quality standards. Additionally, if naturally occurring instream concentration for a substance is higher than the derived permit effluent limitation, the Department may establish permit effluent limitations at a level higher than the derived limit, but no higher than the natural background concentration. In such cases, the Department may require biological instream monitoring and/or WET testing.

(3) When the derived permit effluent limitation based on human health numeric criteria is below the practical quantitation limit for a substance, the derived permit effluent limitation shall include an accompanying statement in the permit that the practical quantitation limit using approved analytical methods shall be considered as being in compliance with the limit. Additionally, if naturally occurring instream concentration for a substance is higher than the derived permit effluent limitation, the Department may establish permit effluent limitations at a level higher than the derived limit, but no higher than the natural background concentration.

(4) NPDES permit effluent limitations for metals shall normally be expressed on the permits as total recoverable metals, but the Department may utilize a federally-approved methodology to predict the dissolved fraction, partitioning coefficient, or the bioavailable portion of metals in calculating these limits.

(5) Except as provided herein, where application of MCLs or W/O numeric criteria using annual average flow for carcinogens, 7Q10 (or 30Q5 if provided by the applicant) for noncarcinogens, or comparable tidal condition as determined by the Department results in permit effluent limitations more stringent than limitations derived from other applicable human health (organism consumption only), aquatic life, or organoleptic numeric values; MCLs or W/O shall be used in establishing permit effluent limitations for human health protection. The Department may, after Notice of Intent included in a notice of a proposed NPDES permit in accordance with Regulation 61-9.124.10, determine that drinking water MCLs or W/O shall not apply to discharges to those waterbodies where there is: no potential to affect an existing or proposed drinking water source and no state-approved source water protection area. For purposes of this section, a proposed drinking water source is one for which a complete permit application, including plans and specifications for the intake, is on file with the Department at the time of consideration of an NPDES permit application. for a discharge that will affect or has the potential to affect the drinking water source.

(6) Except as provided herein, where the Department may determine that an NPDES permitted discharge will not cause, have reasonable potential to cause, or contribute to an exceedence of the numeric criterion for turbidity under the following conditions:

i. The facility withdraws its surface intake water containing turbidity from the same body of water into which the discharge is made;

ii. The facility does not significantly concentrate or contribute additional turbidity to the discharged water;

iii. The facility does not alter the turbidity through chemical or physical means that would cause adverse water quality impacts to occur.

(7) Site-specific permit effluent limitations and alternate criteria less stringent than those derived in accordance with the above requirements may be derived where it is demonstrated that such limits and criteria shall maintain the existing and classified uses, adequate opportunity for public participation in such derivation process has occurred, and the effluent shall not cause criteria for human health to be exceeded. Where a site-specific permit effluent limitation and alternate criterion has been derived, such derivation shall be subject to EPA review as appropriate. Also, at a minimum, opportunity for input in derivation of a site-specific permit effluent limitation and alternate criterion shall be provided via public notice in NPDES permit notices.

(8) In order to protect recreational uses in freshwaters (including FW, and all types of Trout Waters) of the State, NPDES permit effluent limitations shall be specified as indicated below:

i. Monthly Average (*E. coli*)	126 MPN per 100 ml
ii. Daily Maximum (*E. coli*)	349 MPN per 100 ml (see c(12) below)
iii. Shellfish protection	Class SFH requirements for fecal coliform (see c(11)i. and c(11)ii. below) may be specified (in addition to the limits above) for the protection of downstream waters (regardless of their individual classification) with shellfish uses.
iv. Municipal separate storm sewer systems	For municipal separate storm sewer systems (as described in R.61-9.122.26.a.) compliance with the bacterial standards shall be determined in accordance with c(13) below.
v. Protection of upstream and/or downstream waters	Permit limitations may include (in addition to the requirements listed in c(8)i. and c(8)ii. above) one or more bacterial limitations for fecal coliform, *E. coli* and/or enterococci to protect both uses in the specific receiving water body and also to protect any upstream and/or downstream uses that may be required. If more than one bacterial limit is required, the conditions associated with each section below shall apply independently regardless of the water classification at the point of discharge.
vi. Class ORW or ONRW protection	For Class ORW or ONRW waters, the bacterial requirements shall be those applicable to the classification of the waterbody immediately prior to reclassification to either ORW or ONRW, including consideration of natural conditions. See G.5 and G.7 for prohibitions.

(9) In order to protect recreational uses in Class SA saltwaters of the State, NPDES permit effluent limitations shall be specified as indicated below:

i. Monthly Average (enterococci)	35 MPN per 100 ml
ii. Daily Maximum (enterococci)	104 MPN per 100 ml (see c(12) below)
iii. Shellfish protection	Class SFH requirements for fecal coliform (see c(11)i. and c(1)ii. below) may be specified (in addition to the limits above) for the protection of upstream and/or downstream waters (regardless of their individual classification) with shellfish uses.
iv. Municipal separate storm sewer systems	For municipal separate storm sewer systems (as described in R.61-9.122.26.a.) compliance with the

	bacterial standards shall be determined in accordance with c(13) below.
v. Protection of upstream and/or downstream waters	Permit limitations may include (in addition to the requirements listed in c(9)i. and c(9)ii. above) one or more bacterial limitations for fecal coliform, *E. coli* and /or enterococci to protect both uses in the specific receiving water body and also to protect any upstream or downstream uses that may be required. If more than one bacterial limit is required, the conditions associated with each section above or below shall apply independently regardless of the water classification at the point of discharge.
vi. Class ORW or ONRW protection	For Class ORW or ONRW waters, the bacterial requirements shall be those applicable to the classification of the waterbody immediately prior to reclassification to either ORW or ONRW, including consideration of natural conditions. See G.5 and G.7 for prohibitions.

(10) In order to protect recreational uses in Class SB saltwaters of the State, NPDES permit effluent limitations shall be specified as indicated below:

i. Monthly Average (enterococci)	35 MPN per 100 ml
ii. Daily Maximum (enterococci)	501 MPN per 100 ml (see c(12) below)
iii. Class SA recreational daily maximum and/or shellfish protection	Class SA daily maximum (see c(9)ii. above) recreational use requirements for enterococci and/or Class SFH requirements (see c(11)i. and c(11)ii. below) for fecal coliform may be specified (in addition to the limits above) for the protection of upstream and/or downstream waters (regardless of their individual classification).
iv. Municipal separate storm sewer systems	For municipal separate storm sewer systems (as described in R.61-9.122.26.a.) compliance with the bacterial standards shall be determined in accordance with c(13) below.
v. Protection of upstream and/or downstream waters	Permit limitations may include (in addition to the requirements listed in c(10)i. and c(10)ii. above) one or more bacterial limitations for fecal coliform, *E. coli* and /or enterococci to protect both uses in the specific receiving water body and also to protect any upstream or downstream uses that may be required. If more than one bacterial limit is required, the conditions associated with each section above or below shall apply independently regardless of the

	water classification at the point of discharge.
vi. Class ORW or ONRW protection	For Class ORW or ONRW waters, the bacterial requirements shall be those applicable to the classification of the waterbody immediately prior to reclassification to either ORW or ONRW, including consideration of natural conditions. See G.5 and G.7 for prohibitions.

(11) In order to protect for the consumption of shellfish, for any discharge either directly or indirectly in Class SFH waters or in Class SA, Class SB, ORW or ONRW waters with existing and/or approved shellfish harvesting uses as described in Section C.7, including protection of shellfish upstream and/or downstream uses in all waters regardless of their classification, NPDES permit effluent limitations shall be specified as indicated below:

i. For protection of shellfish uses-Monthly Average (Fecal coliform)	14 MPN per 100 ml
ii. For protection of shellfish uses- Daily Maximum (Fecal coliform)	43 MPN per 100 ml (see c(12) below)
iii. For protection of recreational uses - Monthly Average (enterococci)	35 MPN per 100 ml
iv. For protection of recreational uses-Daily Maximum (enterococci)	104 MPN per 100 ml (see c(12) below)
v. Protection of upstream and/or downstream waters	Permit limitations may include (in addition to the requirements listed in c(11)i. through c(11)iv. above) one or more bacterial limitations for fecal coliform, *E. coli* and /or enterococci to protect both uses in the specific receiving water body and also to protect any upstream or downstream uses that may be required. If more than one bacterial limit is required, the conditions associated with each section above shall apply independently regardless of the water classification at the point of discharge.
vi. Municipal separate storm sewer systems	For municipal separate storm sewer systems (as described in R.61-9.122.26.a.) compliance with the bacterial standards shall be determined in accordance with c(13) below.

(12) Provided the permittee verifies in writing to the Department that conditions (12)i. through (12)iv. below have been met, the permittee would be in compliance with the daily maximum bacterial requirement. However, nothing in this regulation precludes

the Department from taking action, depending on the individual circumstances to protect public health and/or the environment.

i. If the facility exceeds the permitted Daily Maximum bacterial limitation listed above (for *E. coli*, enterococci or fecal coliform) but two (2) additional samples collected within 48 hours of the original sample result do NOT exceed the required Daily Maximum limit; and

(A) For all waters not involving shellfish protection (regardless of the specific water classification), the individual bacterial sample result has not exceeded 800 MPN per 100ml, and for those waters involving shellfish protection, the individual bacterial sample result for fecal coliform has not exceeded 200 MPN per 100ml; and

(B) There is neither an existing Consent Order nor Administrative Order associated with the facilities operation of their disinfection system; and

(C) Either:

1. For facilities that routinely collect ten (10) bacterial samples per month (or 120 or more samples per calendar year), there were no more than four (4) total bacteria samples exceeding the daily maximum limit in the previous twelve (12 months); or

2. For facilities other than those listed in (C) 1. above (e.g. smaller facilities or those that do not routinely collect 10 samples or more per month), there was no more than one (1) bacterial sample exceeding the daily maximum limit in the previous twelve (12 months); and

ii. The permittee verifies that all disinfection equipment was fully functional, and the solids handling system was fully functional during that monitoring period; and

iii. Any additional bacterial sampling collected during the monthly monitoring period when the daily maximum exceedance occurred was reasonably distributed in time while maintaining representative sampling; and

iv. The permittee must provide sufficient laboratory data sensitivity (e.g., dilutions) to accurately represent the effluent bacterial concentration to utilize this procedure. Effluent bacterial results reported as greater than (>) do not meet this criteria, since the actual results are unknown.

(13) For waters of the State, where a permit has been issued pursuant to R.61-9.122.26 and R.61-9.122.34, the Department shall consider the permittee in compliance with the established bacterial (i.e., *E. coli*, enterococci, fecal coliform) criteria for recreational uses of the waterbody if the permittee is in compliance with their permit.

(14) TMDL(s), WLA(s), and LA(s) included in currently approved freshwater fecal coliform TMDL documents shall be converted to *E. coli* utilizing a translator equation established by the Department and shall be based upon existing targets included in approved freshwater fecal coliform bacteria TMDL documents.

(15) All effluent permit limitations which include WET shall require that the WET tests be conducted using *Ceriodaphnia dubia (C. dubia)*, except as stated. If the salinity of a discharge to a saline waterbody is high enough to be toxic to *C. dubia, Mysidopsis bahia (M. bahia)* shall be used. If the hardness of a waterbody is low enough to be toxic to *C. dubia, then Daphnia ambugua (D. ambigua)* may be used. Low salinity discharges to saltwater may be tested using either *C.dubia or M. bahia* with salinity adjustment, as determined by the Department. The Department may consider an alternative species if it can be demonstrated that the proposed species meets the requirements of 40 CFR 136.4 and 5., as approved by EPA. EPA test methods (40 CFR 136) for acute and chronic toxicity testing with freshwater organisms or marine and estuarine organisms must be followed. The Department may consider an alternative method if it can be demonstrated that the proposed method meets the requirements of 40 CFR 136, and is approved by EPA.

d. Evaluation of ambient water quality.

(1) If the numeric criterion for toxic pollutants is lower than the analytical detection limit, the criterion is not considered violated if the ambient concentration is below the detection limit and the instream indigenous biological community is not adversely impacted.

(2) If the ambient concentration is higher than the numeric criterion for toxic pollutants, the criterion is not considered violated if biological monitoring has demonstrated that the instream indigenous biological community is not adversely impacted.

(3) In order to appropriately evaluate the ambient water quality for the bioavailability of the dissolved portion of hardness dependent metals, the Department may utilize a federally-approved methodology to predict the dissolved fraction or partitioning coefficient in determining compliance with water quality standards established in this regulation.

(4) The assessment of fecal coliform for purposes of evaluating the shellfish harvesting use for South Carolina's Shellfish Management Units is conducted in accordance with provisions of S.C. Regulation 61-47, Shellfish. R.61-47 also includes specific language describing the use of the allowable 10% exceedence value in the shellfish program.

(5) The assessment of enterococci for purposes of issuing swimming advisories for ocean beaches for recreational use will be based on the single sample maximum of 104/100 ml.

(6) The assessment of enterococci and *E. coli* for purposes of Section 303(d) listing determinations for recreational uses shall be based on the geometric mean with an

allowable 10% exceedence, where sufficient data exists to calculate a geometric mean. In the absence of sufficient data to calculate a geometric mean, the assessment shall be based on the single sample maximum with an allowable 10% exceedence.

15. The Department may require biological or other monitoring in NPDES permits to further ascertain any bioaccumulative effects of pollutants. Such monitoring may include analyses of fish and shellfish, macroinvertebrates, macrophytes, and/or sediments in order to assess the accumulation of pollutants in tissues or sediments that:

    a. May cause or have the potential to cause adverse impacts to the balanced indigenous aquatic community; and

    b. May cause or have the potential to cause adverse impacts to human health and/or terrestrial flora and fauna.

16. The Department may consider other scientifically-defensible published data which are appropriate for use in developing permit limits and evaluating water quality for constituents for which EPA has not developed national criteria or South Carolina has no standards.

    a. The Department shall apply a sensitivity factor to aquatic toxicity data unless, in the Department's judgment, the data represent a minimum of three appropriately sensitive species representing three taxonomic groups (plant, macroinvertebrate, and fish).

    (1) If only an acute toxicity effect concentration for a number of species for a particular pollutant is given as an LC_{50}, the lowest concentration should be divided by an acute-to-chronic ratio (ACR) of 10 and a sensitivity factor of 3.3, for an acceptable instream concentration in order to protect against chronic toxicity effects.

    (2) If a chronic toxicity effect concentration for a number of species for a particular pollutant is given as a no observed effect concentration (NOEC), the lowest concentration should be divided by a sensitivity factor of 3.3 in order to protect against chronic toxicity to the most sensitive species.

    b. The Department must notify the permittee that other such data were used in developing permit limits and provide justification for their use.

17. Tests or analytical methods to determine compliance or non-compliance with standards shall be made in accordance with methods and procedures approved by the Department and the EPA. In making any tests or applying analytical methods to determine compliance or non-compliance with water quality standards, representative samples shall be collected in accordance with methods and procedures approved by the Department and the EPA. Consideration of representative sample methods shall include the following:

    a. Surface water and ground water samples shall be collected so as to permit a realistic appraisal of quality and actual or potential damage to existing or classified water uses. For ground waters, consideration shall be given to, but shall not be limited to, depth to

water table, flow direction, and velocity. For surface waters, time of day, flow, surface area, and depth shall be considered.

b. Biological assessment methods may be employed in appropriate situations to determine abnormal nutrient enrichment, trophic condition, LC_{50}, concentration of toxic substances, acceptable instream concentrations, or acceptable effluent concentrations for maintenance of a balanced indigenous aquatic community.

c. Temporal distribution of samples in tidally influenced waters shall cover the full range of tidal conditions.

d. Ambient toxicity tests used for screening purposes shall be conducted using *Ceriodaphnia dubia* (*C. dubia*), except as stated. If salinity of a waterbody is high enough to be toxic to *C. dubia*, *Mysidopsis bahia* (*M. bahia*) will be used. If the hardness of a waterbody is low enough to be toxic to *C. dubia,* then *Daphnia ambigua (D. ambigua)* may be used. The Department may consider an alternative species if it can be demonstrated that the proposed species meets the requirements of 40 CFR.136.4 and 5, as approved by EPA. EPA test methods (40 CFR Part 136) for acute and chronic toxicity testing with freshwater organisms or marine and estuarine organisms must be followed. The Department may consider an alternative method if it can be demonstrated that the proposed method meets the requirements of 40 CFR.136, and is approved by EPA.

18. For the protection of human health, methylmercury concentration in fish or shellfish shall not exceed 0.3 mg/kg in wet weight of edible tissue.

a. NPDES permit implementation for methylmercury will require mercury monitoring, assessment and minimization for discharges that meet the following conditions;

(1) The receiving stream is impaired for methylmercury in fish or shellfish tissue, and;

(2) The discharge or proposed discharge has consistently quantifiable levels of mercury.

b. The need for a total mercury effluent limit, for the protection of aquatic life and/or human health, pursuant to R.61-9.122.44(d), shall be based on a reasonable potential analysis of the discharge compared to the mercury standards for ambient waters.

19. The assessment of methylmercury in fish or shellfish for purposes of Section 303(d) listing determinations shall be based on the Department's Fish Consumption Advisories.

F. NARRATIVE BIOLOGICAL CRITERIA.

1. Narrative biological criteria are contained in this regulation and are described throughout the sections where applicable. The following are general statements regarding these narrative biological criteria.

a. Narrative biological criteria in Section A.4. describe the goals of the Department to maintain and improve all surface waters to a level that provides for the survival and propagation of a balanced indigenous aquatic community of fauna and flora. These narrative criteria are determined by the Department based on the condition of the waters of the State by measurements of physical, chemical, and biological characteristics of the waters according to their classified uses.

b. Section C.10. describes narrative biological criteria relative to surface water mixing zones and specifies requirements necessary for the protection and propagation of a balanced indigenous aquatic community.

c. Narrative biological criteria shall be consistent with the objective of maintaining and improving all surface waters to a level that provides for the survival and propagation of a balanced indigenous aquatic community of fauna and flora attainable in waters of the State; and in all cases shall protect against degradation of the highest existing or classified uses or biological conditions in compliance with the antidegradation rules contained in this regulation. Section D.1.a. describes narrative biological criteria relative to activities in Outstanding National Resource Waters, Outstanding Resource Waters and Shellfish Harvesting Waters.

d. In order to determine the biological quality of the waters of the State, it is necessary that the biological component be assessed by comparison to a reference condition(s) based upon similar hydrologic and watershed characteristics that represent the optimum natural condition for that system. Such reference condition(s) or reaches of waterbodies shall be those observed to support the greatest variety and abundance of aquatic life in the region as is expected to be or would be with a minimal amount of disturbance from anthropogenic sources. Impacts from urbanization and agriculture should be minimal and natural vegetation should dominate the land cover. There should also be an appropriate diversity of substrate. Reference condition(s) shall be determined by consistent sampling and reliable measures of selected indicative communities of flora and fauna as established by the Department and may be used in conjunction with acceptable physical, chemical, and microbial water quality measurements and records judged to be appropriate for this purpose. Narrative biological criteria relative to activities in all waters are described in Section E.

e. In the Class Descriptions, Designations, and Specific Standards for Surface Waters Section, all water use classifications protect for a balanced indigenous aquatic community of fauna and flora. In addition, Trout Natural and Trout Put, Grow, and Take classifications protect for reproducing trout populations and stocked trout populations, respectively.

2. [Reserved].

G. CLASS DESCRIPTIONS, DESIGNATIONS, AND SPECIFIC STANDARDS FOR SURFACE WATERS.

1. All surface waters of the State, except as discussed in Section C., shall be identified within one of the classes described below. The Department may determine in accordance with Section 312 of the Clean Water Act that for some waterbodies (or portions of waterbodies), the designation of No Discharge Zone (NDZ) for Marine Sanitation Devices (MSDs) shall be enacted with application of the existing classified standards of the waterbody. Those waters classified by name shall be listed in Regulation 61-69 along with the NDZ designation, if applicable.

2. Where a surface water body is tributary to waters of a higher class, the quality of the water in the tributary shall be protected to maintain the standards of the higher classified receiving water.

3. For items not listed in each class, criteria published pursuant to Sections 304(a) and 307(a) of the Federal Clean Water Act or other documents shall be used as guides to determine conditions which protect water uses. Many of these criteria are listed in the appendix to this regulation. For consideration of natural conditions, refer to Sections: C.9., D.4., E.12., E.14.c.(2), E.14.c.(3), F.4.d., G.4., G.6., and G.9. For the following numeric criteria for turbidity (with the exception of Outstanding National Resource Waters, Outstanding Resource Waters, Trout waters, and Shellfish Harvesting Waters), compliance with these turbidity criteria may be considered to be met as long as the waterbody supports a balanced indigenous aquatic community when land management activities employ Best Management Practices (BMPs). For consideration, BMPs must be in full compliance with all specifications governing the proper design, installation, operation and maintenance of such BMPs and all applicable permit conditions and requirements must be met.

4. **Outstanding National Resource Waters (ONRW)** are freshwaters or saltwaters which constitute an outstanding national recreational or ecological resource.

Quality Standards for Outstanding National Resource Waters	
ITEMS	**STANDARDS**
a. Color, dissolved oxygen, fecal coliform enterococci, *E. coli*, pH, temperature, turbidity, and other parameters.	Water quality conditions shall be maintained and protected to the extent of the Department's statutory authority. Numeric and narrative criteria for Class ONRW shall be those applicable to the classification of the waterbody immediately prior to reclassification to Class ONRW, including consideration of natural conditions.

5. In order to maintain the existing quality of Class ONRW waters the following additional standards apply:

ITEMS	**STANDARDS**
a. Discharge from domestic, industrial, or	None allowed.

agricultural waste treatment facilities; aquaculture; open water dredged spoil disposal.	
b. Stormwater, and other nonpoint source runoff, including that from agricultural uses, or permitted discharge from aquatic farms, concentrated aquatic animal production facilities, and uncontaminated groundwater from mining.	None allowed.
c. Dumping or disposal of garbage, cinders, ashes, oils, sludge, or other refuse.	None allowed.
d. Activities or discharges from waste treatment facilities in waters upstream or tributary to ONRW waters.	Allowed if there shall be no measurable impact on the downstream ONRW consistent with antidegradation rules.

6. **Outstanding Resource Waters (ORW)** are freshwaters or saltwaters which constitute an outstanding recreational or ecological resource or those freshwaters suitable as a source for drinking water supply purposes with treatment levels specified by the Department.

Quality Standards for Outstanding Resource Waters	
ITEMS	**STANDARDS**
a. Color, dissolved oxygen, fecal coliform enterococci, *E. coli*, pH, temperature, turbidity, and other parameters.	Water quality conditions shall be maintained and protected to the extent of the Department's statutory authority. Numeric and narrative criteria for Class ORW shall be those applicable to the classification of the waterbody immediately prior to reclassification to Class ORW, including consideration of natural conditions.

7. In order to maintain the existing quality of Class ORW waters the following additional standards apply:

ITEMS	**STANDARDS**
a. Discharge from	None allowed.

domestic, industrial, or agricultural waste treatment facilities; aquaculture; open water dredged spoil disposal.	
b. Stormwater, and other nonpoint source runoff, including that from agricultural uses, or permitted discharge from aquatic farms, concentrated aquatic animal production facilities, and uncontaminated groundwater from mining.	Allowed if water quality necessary for existing and classified uses shall be maintained and protected consistent with antidegradation rules.
c. Dumping or disposal of garbage, cinders, ashes, oils, sludge, or other refuse.	None allowed.
d. Activities or discharges from waste treatment facilities in waters upstream or tributary to ORW waters.	Allowed if water quality necessary for existing and classified uses shall be maintained and protected consistent with antidegradation rules.

8. **Trout Waters**. The State recognizes three types of trout waters: Natural; Put, Grow, and Take; and Put and Take.

   a. **Natural (TN)** are freshwaters suitable for supporting reproducing trout populations and a cold water balanced indigenous aquatic community of fauna and flora. Also suitable for primary and secondary contact recreation and as a source for drinking water supply after conventional treatment in accordance with the requirements of the Department. Suitable for fishing and the survival and propagation of a balanced indigenous aquatic community of fauna and flora. Suitable also for industrial and agricultural uses.

   b. **Put, Grow, and Take (TPGT)** are freshwaters suitable for supporting growth of stocked trout populations and a balanced indigenous aquatic community of fauna and flora. Also suitable for primary and secondary contact recreation and as a source for drinking water supply after conventional treatment in accordance with the requirements of the Department. Suitable for fishing and the survival and propagation of a balanced indigenous aquatic community of fauna and flora. Suitable also for industrial and agricultural uses.

c. **Put and Take (TPT)** are freshwaters suitable for primary and secondary contact recreation and as a source for drinking water supply after conventional treatment in accordance with the requirements of the Department. Suitable for fishing and the survival and propagation of a balanced indigenous aquatic community of fauna and flora. Suitable also for industrial and agricultural uses. The standards of Freshwaters classification protect these uses.

9. The standards below protect the uses of Natural and Put, Grow, and Take trout waters.

Quality Standards for Trout Waters	
ITEMS	**STANDARDS**
a. Garbage, cinders, ashes, oils, sludge, or other refuse	None allowed.
b. Treated wastes, toxic wastes, deleterious substances, colored or other wastes except those given in a. above.	None alone or in combination with other substances or wastes in sufficient amounts to be injurious to reproducing trout populations in natural waters or stocked populations in put, grow, and take waters or in any manner adversely affecting the taste, color, odor, or sanitary condition thereof or impairing the waters for any other best usage as determined for the specific waters which are assigned to this class.
c. Toxic pollutants listed in the appendix.	As prescribed in Section E of this regulation.
d. Stormwater, and other nonpoint source runoff, including that from agricultural uses, or permitted discharge from aquatic farms, concentrated aquatic animal production facilities, and uncontaminated groundwater from mining.	Allowed if water quality necessary for existing and classified uses shall be maintained and protected consistent with antidegradation rules.
e. Dissolved oxygen.	Not less than 6 mg/l.
f. *E. coli*	Not to exceed a geometric mean of 126/100 ml based on at least four samples collected from a given sampling site over a 30 day period, nor shall a single sample maximum exceed 349/100 ml.
g. pH.	Between 6.0 and 8.0.
h. Temperature.	Not to vary from levels existing under natural conditions, unless determined that some other temperature shall protect the classified uses.
i. Turbidity.	Not to exceed 10 Nephelometric Turbidity Units

	(NTUs) or 10% above natural conditions, provided uses are maintained.

10. **Freshwaters (FW)** are freshwaters suitable for primary and secondary contact recreation and as a source for drinking water supply after conventional treatment in accordance with the requirements of the Department. Suitable for fishing and the survival and propagation of a balanced indigenous aquatic community of fauna and flora. Suitable also for industrial and agricultural uses.

Quality Standards for Freshwaters	
ITEMS	**STANDARDS**
a. Garbage, cinders, ashes, oils, sludge, or other refuse	None allowed.
b. Treated wastes, toxic wastes, deleterious substances, colored or other wastes except those given in a. above.	None alone or in combination with other substances or wastes in sufficient amounts to make the waters unsafe or unsuitable for primary contact recreation or to impair the waters for any other best usage as determined for the specific waters which are assigned to this class.
c. Toxic pollutants listed in the appendix.	As prescribed in Section E of this regulation.
d. Stormwater, and other nonpoint source runoff, including that from agricultural uses, or permitted discharge from aquatic farms, concentrated aquatic animal production facilities, and uncontaminated groundwater from mining.	Allowed if water quality necessary for existing and classified uses shall be maintained and protected consistent with antidegradation rules.
e. Dissolved oxygen.	Daily average not less than 5.0 mg/l with a low of 4.0 mg/1.
f. *E. coli*	Not to exceed a geometric mean of 126/100 ml based on at least four samples collected from a given sampling site over a 30 day period, nor shall a single sample maximum exceed 349/100 ml.
g. pH.	Between 6.0 and 8.5.
h. Temperature.	As prescribed in E.12. of this regulation.
i. Turbidity. Except for Lakes. Lakes only.	Not to exceed 50 NTUs provided existing uses are maintained. Not to exceed 25 NTUs provided existing uses are

	maintained.

11. **Shellfish Harvesting Waters (SFH)** are tidal saltwaters protected for shellfish harvesting and uses listed in Class SA and Class SB. Suitable for primary and secondary contact recreation, crabbing, and fishing. Also suitable for the survival and propagation of a balanced indigenous aquatic community of marine fauna and flora.

Quality Standards for Shellfish Harvesting Waters	
ITEMS	**STANDARDS**
a. Garbage, cinders, ashes, oils, sludge, or other refuse	None allowed.
b. Treated wastes, toxic wastes, deleterious substances, colored or other wastes except those given in a. above.	None alone or in combination with other substances or wastes in sufficient amounts to adversely affect the taste, color, odor, or sanitary condition of clams, mussels, or oysters for human consumption; or to impair the waters for any best usage as determined for the specific waters which are assigned to this class.
c. Toxic pollutants listed in the appendix.	As prescribed in Section E of this regulation.
d. Stormwater, and other nonpoint source runoff, including that from agricultural uses, or permitted discharge from aquatic farms, and concentrated aquatic animal production facilities.	Allowed if water quality necessary for existing and classified uses shall be maintained and protected consistent with antidegradation rules.
e. Dissolved oxygen.	Daily average not less than 5.0 mg/l with a low of 4 mg/l.
f. Fecal coliform.	Not to exceed an MPN fecal coliform geometric mean of 14/100 ml; nor shall the samples exceed an MPN of 43/100 ml.
g. Enterococci.	Not to exceed a geometric mean of 35/100 ml based on at least four samples collected from a given sampling site over a 30 day period; nor shall a single sample maximum exceed 104/100 ml. Additionally, for beach monitoring and notification activities for CWA Section 406 only, samples shall not exceed a single sample maximum of 104/100 ml.
h. pH.	Shall not vary more than 3/10 of a pH unit above or below that of effluent-free waters in the same geological area having a similar total alkalinity and temperature, but not lower than 6.5 or above 8.5.

i. Temperature.	As prescribed in E.12. of this regulation.
j. Turbidity.	Not to exceed 25 (NTUs) provided existing uses are maintained.

k. The Department may designate prohibited areas where shellfish harvesting for market purposes or human consumption shall not be allowed, consistent with the antidegradation rule, Section D.1.a. of this regulation.

12. **Class SA** are tidal saltwaters suitable for primary and secondary contact recreation, crabbing, and fishing, except harvesting of clams, mussels, or oysters for market purposes or human consumption and uses listed in Class SB. Also suitable for the survival and propagation of a balanced indigenous aquatic community of marine fauna and flora.

Quality Standards for Class SA Waters	
ITEMS	**STANDARDS**
a. Garbage, cinders, ashes, oils, sludge, or other refuse.	None allowed.
b. Treated wastes, toxic wastes, deleterious substances, colored or other wastes except those given in a. above.	None alone or in combination with other substances or wastes in sufficient amounts to make the waters unsafe or unsuitable for primary contact recreation or to impair the waters for any other best usage as determined for the specific waters which are assigned to this class.
c. Toxic pollutants listed in the appendix.	As prescribed in Section E of this regulation.
d. Stormwater, and other nonpoint source runoff, including that from agricultural uses, or permitted discharge from aquatic farms, and concentrated aquatic animal production facilities.	Allowed if water quality necessary for existing and classified uses shall be maintained and protected consistent with antidegradation rules.
e. Dissolved oxygen.	Daily average not less than 5.0 mg/1 with a low of 4.0 mg/1.
f. Enterococci.	Not to exceed a geometric mean of 35/100 ml based on at least four samples collected from a given sampling site over a 30 day period; nor shall a single sample maximum exceed 104/100 ml. Additionally, for beach monitoring and notification activities for CWA Section 406 only, samples shall not exceed a single sample maximum of 104/100 ml.
g. pH.	Shall not vary more than one-half of a pH unit above or below that of effluent-free waters in the same

	geological area having a similar total salinity, alkalinity and temperature, but not lower than 6.5 or above 8.5
h. Temperature.	As prescribed in E.12. of this regulation.
i. Turbidity.	Not to exceed 25 NTUs provided existing uses are maintained.

j. The Department shall protect existing shellfish harvesting uses found in Class SA waters consistent with the antidegradation rule, Section D.1.a. of this regulation and shall establish permit limits in accordance with Section E.14.c(8), (9), (10), and (11) and Section G.11.f. of this regulation.

13. **Class SB** are tidal saltwaters suitable for primary and secondary contact recreation, crabbing, and fishing, except harvesting of clams, mussels, or oysters for market purposes or human consumption or human consumption. Also suitable for the survival and propagation of a balanced indigenous aquatic community of marine fauna and flora.

Quality Standards for Class SB Waters	
ITEMS	**STANDARDS**
a. Garbage, cinders, ashes, oils, sludge, or other refuse	None allowed.
b. Treated wastes, toxic wastes, deleterious substances, colored or other wastes except those given in a. above.	None alone or in combination with other substances or wastes in sufficient amounts to make the waters unsafe or unsuitable for primary contact recreation or to impair the waters for any other best usage as determined for the specific waters which are assigned to this class.
c. Toxic pollutants listed in the appendix.	As prescribed in Section E of this regulation.
d. Stormwater, and other nonpoint source runoff, including that from agricultural uses, or permitted discharge from aquatic farms, and concentrated aquatic animal production facilities.	Allowed if water quality necessary for existing and classified uses shall be maintained and protected consistent with antidegradation rules.
e. Dissolved oxygen.	Not less than 4.0 mg/1.
f. Enterococci.	Not to exceed a geometric mean of 35/100 ml based on at least four samples collected from a given sampling site over a 30 day period; nor shall a single sample maximum exceed 501/100 ml. Additionally, for beach monitoring and notification activities for CWA Section 406 only, samples shall not exceed a

	single sample maximum of 501/100 ml.
g. pH.	Shall not vary more than one-half of a pH unit above or below that of effluent-free waters in the same geological area having a similar total salinity, alkalinity and temperature, but not lower than 6.5 or above 8.5
h. Temperature.	As prescribed in E.12. of this regulation.
i. Turbidity.	Not to exceed 25 NTUs provided existing uses are maintained.

j. The Department shall protect existing shellfish harvesting uses found in Class SB waters consistent with the antidegradation rule, Section D.1.a. of this regulation and shall establish permit limits in accordance with Section E.14.c(8), (9), (10), and (11) and Section G.11.f. of this regulation.

H. CLASS DESCRIPTIONS AND SPECIFIC STANDARDS FOR GROUND WATERS.

1. All ground waters of the State, except within mixing zones, shall be identified within one of the classes described below.

2. It is the policy of the Department to maintain the quality of ground water consistent with the highest potential uses. Most South Carolina ground water is presently suitable for drinking water without treatment and the State relies heavily upon ground water for drinking water. For this reason, all South Carolina ground water is classified Class GB effective on June 28, 1985.

3. The Department recognizes that Class GB may not be suitable for some ground water. Class GA is established for exceptionally valuable ground water and Class GC is established for ground water with little potential as an underground source of drinking water.

4. In keeping with this policy the Department declares that effective June 28, 1985, all ground waters of the State shall be protected to a quality consistent with the use associated with the classes described herein. Further, the Department may require the owner or operator of a contaminated site to restore the ground water quality to a level that maintains and supports the existing and classified uses (except classified uses within mixing zones, as described in this regulation). For purposes of this section, the term operator means any person in control of, or having responsibility for, the operation of on-site activities or property and owner means a person or a previous person who has assumed legal ownership of a property through the provisions of a contract of sale or other legally binding transfer of ownership. The term owner also means any person who owned, operated, or otherwise controlled activities at such site before the title or control of which was conveyed to a unit of State or local government due to bankruptcy, foreclosure, tax delinquency, abandonment, or similar means. However, nothing in this section shall be construed to supersede specific statutory or regulatory provision that relieves owners or operators of certain contaminated sites from liability for restoration of groundwater, including, without limitation, S.C. Code '44-2-80 (b) and (c). The term does not include a unit of State or local government which acquired

ownership or control involuntarily through bankruptcy, tax delinquency, abandonment, or other circumstances in which the government involuntarily acquires title by virtue of its function as sovereign. The exclusion provided under this paragraph shall not apply to any State or local government which has caused or contributed to the release or threatened release of a contaminant from the site, and such a State or local government shall be subject to these provisions in the same manner and to the same extent, both procedurally and substantively, as any nongovernmental entity.

5. A ground water monitoring program approved by the Department may be required for any existing or proposed disposal system or other activities to determine the ground water quality affected by such systems or activities. Such monitoring program may be required through the Department's permitting and certification programs.

6. Those ground waters which are classified Class GA or Class GC after petition and proper administrative procedures other than Class GB shall be described by location and listed in Regulation 61-69.

7. **Class GA** are those ground waters that are highly vulnerable to contamination because of the hydrological characteristics of the areas under which they occur and that are also characterized by either of the following two factors:

   a. Irreplaceable, in that no reasonable alternative source of drinking water is available to substantial populations; or

   b. Ecologically vital, in that the ground water provides the base flow for a particularly sensitive ecological system that, if polluted, would destroy a unique habitat.

8. The standards below protect these ground waters:

Quality Standards for Class GA Ground Waters	
ITEMS	**STANDARDS**
a. Treated wastes, toxic wastes, deleterious substances, or constituents thereof.	None allowed.

9. **Class GB**. All ground waters of the State, unless classified otherwise, which meet the definition of underground sources of drinking water (USDW) as defined in Section B.

Quality Standards for Class GB Ground Waters	
ITEMS	**STANDARDS**
a. Inorganic chemicals.	Maximum contaminated levels as set forth in R.61-58, State Primary Drinking Water Regulations.
b. Organic chemicals.	Maximum contaminated levels as set forth in R.61-58, State Primary Drinking Water Regulations.
c. Man-made	Not to exceed concentrations or amounts such as to

radionuclides, priority pollutant volatile organic compounds, herbicides, polychlorinated biphenyls, and other synthetic organic compounds not specified above, treated wastes, thermal wastes, colored wastes or other wastes of constituents thereof.	interfere with the use actual or intended, as determined by the Department.

10. **Class GC** are those ground waters not considered potential sources of drinking water and of limited beneficial use, i.e., ground waters that exceed a concentration of 10,000 mg/l total dissolved solids or are otherwise contaminated beyond levels that allow cleanup using methods reasonably employed in public water system treatment. These ground waters also must not migrate to Class GA or Class GB ground waters or have a discharge to surface water that could cause degradation.

Quality Standards for Class GC Ground Waters	
ITEMS	**STANDARDS**
a. Treated wastes, toxic wastes, deleterious substances, or constituents thereof.	None which interfere with any existing use of an underground source of drinking water.

I. SEVERABILITY.

Should any section, paragraph, or other part of this regulation be declared invalid for any reason, the remainder shall not be affected.

APPENDIX: WATER QUALITY NUMERIC CRITERIA FOR THE PROTECTION OF AQUATIC LIFE AND HUMAN HEALTH

This appendix contains three charts (priority pollutants, nonpriority pollutants, and organoleptic effects) of numeric criteria for the protection of human health and aquatic life. The appendix also contains three attachments which address hardness conversions and application of ammonia criteria. Footnotes specific to each chart follow the chart. General footnotes pertaining to all are at the end of the charts prior to the attachments. The numeric criteria developed and published by EPA are hereby incorporated into this regulation. Please refer to the text of the regulation for other general information and specifications in applying these numeric criteria.

PRIORITY TOXIC POLLUTANTS

Priority Pollutant		CAS Number	Freshwater Aquatic Life		Saltwater Aquatic Life		Human Health			FR Cite/ Source
			CMC (µg/L)	CCC (µg/L)	CMC (µg/L)	CCC (µg/L)	For Consumption of: Water & Organism (µg/L)	Organism Only (µg/L)	MCL (µg/L)	
1	Antimony	7440360					5.6 B, ee	640 B, ee	6 ee	65FR66443 SDWA
2	Arsenic	7440382	340 A, D, K	150 A, D, K	69 A, D, Y	36 A, D, Y	10 C	10 C	10 C	65FR31682 57FR60848 SDWA
3	Beryllium	7440417					J, ee	J, ee	4 ee	65FR31682 SDWA
4	Cadmium	7440439	0.53 D, E, K	0.10 D, E, K	43 D, Y	9.3 D, Y	J, ee	J, ee	5 ee	65FR31682 SDWA
5a	Chromium III	16065831	580 D, E, K	28 D, E, K			J, ee	J, ee	100 Total ee	EPA820/B-96-001 65FR31682 SDWA
5b	Chromium VI	18540299	16 D, K	11 D, K	1,100 D, Y	50 D, Y	J, ee	J, ee	100 Total ee	65FR31682 SDWA
6	Copper	7440508	3.8 D, E, K, Z, ll	2.9 D, E, K, Z, ll	5.8 D, Z, Y, cc	3.7 D, Z, Y, cc	1,300 T, ee			65FR31682

Priority Pollutant		CAS Number	Freshwater Aquatic Life		Saltwater Aquatic Life		Human Health			FR Cite/ Source
			CMC (µg/L)	CCC (µg/L)	CMC (µg/L)	CCC (µg/L)	For Consumption of: Water & Organism (µg/L)	Organism Only (µg/L)	MCL (µg/L)	
7	Lead	7439921	14 D, E, Y	0.54 D, E, Y	220 D, Y	8.5 D, Y				65FR31682
8	Mercury	7439976	1.6 D, K, dd	0.91 D, K, dd	2.1 D, bb, dd	1.1 D, bb, dd	0.050 B, ee	0.051 B, ee	2 ee	65FR31682 SDWA
9	Nickel	7440020	150 D, E, K	16 D, E, K	75 D, Y	8.3 D, Y	610 B, ee	4, 600 B, ee		65FR31682
10	Selenium	7782492	L, Q, S	5.0 S	290 D, aa	71 D, aa	170 Z, ee	4,200 ee	50 ee	65FR31682 65FR66443 SDWA
11	Silver	7440224	0.37 D, E, G		2.3 D, G					65FR31682
12	Thallium	7440280					0.24	0.47	2 ee	68FR75510 SDWA
13	Zinc	7440666	37 D, E, K	37 D, E, K	95 D, Y	86 D, Y	7,400 T, ee	26,000 T, ee		65FR31682 65FR66443
14	Cyanide	57125	22 K, P	5.2 K, P	1 P, Y	1 P, Y	140 ee, jj	140 ee, jj	200 ee	EPA820/B-96-001 57FR60848 68FR75510 SDWA
15	Asbestos	1332214							7 million fibers/L I, ee	57FR60848
16	2, 3, 7, 8-TCDD (Dioxin)	1746016						0.046 ppq O, C	30ppq O, C	State Standard SDWA
17	Acrolein	107028	3	3			6 ee, nn	9 ee, nn		74FR27535 74FR46587
18	Acrylonitrile	107131					0.051 B, C	0.25 B, C		65FR66443

Priority Pollutant		CAS Number	Freshwater Aquatic Life		Saltwater Aquatic Life		Human Health			FR Cite/ Source
			CMC (µg/L)	CCC (µg/L)	CMC (µg/L)	CCC (µg/L)	For Consumption of: Water & Organism (µg/L)	Organism Only (µg/L)	MCL (µg/L)	
19	Benzene	71432					2.2 B, C	51 B, C	5 C	IRIS 01/19/00 65FR66443 SDWA
20	Bromate	15541454							10 C	SDWA
21	Bromoform	75252					4.3 B, C	140 B, C	80 Total THMs C	65FR66443 SDWA
22	Bromoacetic acid	79083							60 Total HAA5 C,mm	SDWA
23	Carbon Tetrachloride	56235					0.23 B, C	1.6 B, C	5 C	65FR66443 SDWA
24	Chlorite	67481							100	SDWA
25	Chlorobenzene	108907					130T, ee	1,600 T, ee	100 T, ee	68FR75510 SDWA
26	Chlorodibromomethane	124481					0.40 B, C	13 B, C	80 Total THMs C	65FR66443 SDWA
27	Chloroform	67663					5.7 B, C, hh	470 B, C, hh	80 Total THMs C	62FR42160 SDWA
28	Dibromoacetic acid	631641							60 Total HAA5 C, mm	SDWA
29	Dichloroacetic acid	79436							60 Total HAA5 C,mm	SDWA
30	Dichlorobromomethane	75274					0.55 B, C	17 B, C	80 Total THMs C	65FR66443 SDWA
31	1, 2-Dichloroethane	107062					0.38 B, C	37 B, C	5 C	65FR66443 SDWA

Priority Pollutant		CAS Number	Freshwater Aquatic Life		Saltwater Aquatic Life		Human Health			FR Cite/ Source
			CMC (µg/L)	CCC (µg/L)	CMC (µg/L)	CCC (µg/L)	For Consumption of: Water & Organism (µg/L)	Organism Only (µg/L)	MCL (µg/L)	
32	1, 1-Dichloroethylene	75354					330 ee	7,100 ee	7 C	68FR75510 SDWA
33	1, 2-Dichloropropane	78875					0.50 B, C	15 B, C	5 C	65FR66443 SDWA
34	1, 3-Dichloropropene	542756					0.34 ee	21 ee		68FR75510
35	Ethylbenzene	100414					530 ee	2,100 ee	700 ee	68FR75510 SDWA
36	Methyl Bromide	74839					47 B, ee	1,500 B, ee		65FR66443
37	Methylene Chloride	75092					4.6 B, C	590 B, C	5 C	65FR66443 SDWA
38	Monochloroacetic acid	79118							60 Total HAA5 C,mm	SDWA
39	1, 1, 2, 2-Tetrachloroethane	79345					0.17 B, C	4.0 B, C		65FR66443
40	Tetrachloroethylene	127184					0.69 C	3.3 C	5 C	65FR66443 SDWA
41	Toluene	108883					1,300 ee	15,000 ee	1000 ee	68FR75510 SDWA
42	1,2-Trans-Dichloroethylene	156605					140 ee	10,000 ee	100 ee	68FR75510 SDWA
43	Trichloroacetic acid	79039							60 Total HAA5 C,mm	SDWA

Priority Pollutant		CAS Number	Freshwater Aquatic Life		Saltwater Aquatic Life		Human Health			FR Cite/ Source
			CMC (µg/L)	CCC (µg/L)	CMC (µg/L)	CCC (µg/L)	For Consumption of: Water & Organism (µg/L)	Organism Only (µg/L)	MCL (µg/L)	
44	1, 1, 1-Trichloroethane	71556					J, ee	J, ee	200 ee	65FR31682 SDWA
45	1, 1, 2-Trichloroethane	79005					0.59 B, C	16 B, C	5 C	65FR66443 SDWA
46	Trichloroethylene	79016					2.5 C	30 C	5 C	65FR66443 SDWA
47	Vinyl Chloride	75014					0.025 kk	2.4 kk	2 C	68FR75510 SDWA
48	2-Chlorophenol	95578					81 B, T, ee	150 B, T, ee		65FR66443
49	2, 4-Dichlorophenol	120832					77 B, T, ee	290 B, T, ee		65FR66443
50	2, 4-Dimethylphenol	105679					380 B, T, ee	850 B, T, ee		65FR66443
51	2-Methyl- 4, 6-Dinitrophenol	534521					13 ee	280 ee		65FR66443
52	2, 4-Dinitrophenol	51285					69 B, ee	5,300 B, ee		65FR66443
53	Pentachlorophenol	87865	19 F, K	15 F, K	13 Y	7.9 Y	0.27 B, C	3.0 B, C, H	1 C	65FR31682 65FR66443 SDWA
54	Phenol	108952					10,000 T, ee, nn	860,000 T, ee, nn		74FR27535 74FR46587
55	2, 4, 6-Trichlorophenol	88062					1.4 B, C, T	2.4 B, C		65FR66443

Priority Pollutant		CAS Number	Freshwater Aquatic Life		Saltwater Aquatic Life		Human Health			FR Cite/ Source
			CMC (µg/L)	CCC (µg/L)	CMC (µg/L)	CCC (µg/L)	For Consumption of: Water & Organism (µg/L)	Organism Only (µg/L)	MCL (µg/L)	
56	Acenaphthene	83329					670 B, T, ee	990 B, T, ee		65FR66443
57	Anthracene	120127					8,300 B, ee	40,000 B, ee		65FR66443
58	Benzidine	92875					0.000086 B, C	0.00020 B, C		65FR66443
59	Benzo (a) Anthracene	56553					0.0038 B, C	0.018 B, C		65FR66443
60	Benzo (a) Pyrene	50328					0.0038 B, C	0.018 B, C	0.2 C	65FR66443 SDWA
61	Benzo (b) Fluoranthene	205992					0.0038 B, C	0.018 B, C		65FR66443
62	Benzo (k) Fluoranthene	207089					0.0038 B, C	0.018 B, C		65FR66443
63	Bis-2-Chloroethyl Ether	111444					0.030 B, C	0.53 B, C		65FR66443
64	Bis-2-Chloroisopropyl Ether	108601					1,400 B, ee	65,000 B, ee		65FR66443
65	Bi-s2-Ethylhexyl Phthalate (DEHP)	117817	V	V	V	V	1.2 B, C	2.2 B, C	6 C	65FR66443 SDWA
66	Butylbenzene Phthalate	85687	ii	ii	ii	ii	1,500 B, ee	1,900 B, ee		65FR66443
67	2-Chloronaphthalene	91587					1,000 B, ee	1,600 B, ee		65FR66443

Priority Pollutant		CAS Number	Freshwater Aquatic Life		Saltwater Aquatic Life		Human Health			FR Cite/ Source
			CMC (µg/L)	CCC (µg/L)	CMC (µg/L)	CCC (µg/L)	For Consumption of: Water & Organism (µg/L)	Organism Only (µg/L)	MCL (µg/L)	
68	Chrysene	218019					0.0038 B, C	0.018 B, C		65FR66443
69	Dibenzo(a,h)Anthracene	53703					0.0038 B, C	0.018 B, C		65FR66443
70	1, 2-Dichlorobenzene	95501					420 ee	1,300 ee	600 ee	68FR75510 SDWA
71	1, 3-Dichlorobenzene	541731					320 ee	960 ee		65FR66443
72	1, 4-Dichlorobenzene	106467					63 ee	190 ee	75 ee	68FR75510 SDWA
73	3, 3'-Dichlorobenzidine	91941					0.021 B, C	0.028 B, C		65FR66443
74	Diethyl Phthalate	84662	ii	ii	ii	ii	17,000 B, ee	44,000 B, ee		65FR66443
75	Dimethyl Phthalate	13113	ii	ii	ii	ii	270,000 B, ee	1,100,000 B, ee		64FR66443
76	Di-n-butyl Phthalate	84742	ii	ii	ii	ii	2,000 B, ee	4,500 B, ee		65FR66443
77	2, 4-Dinitrotoluene	121142					0.11 C	3.4 C		65FR66443
78	1, 2-Diphenylhydrazine	122667					0.036 B, C	0.20 B, C		65FR66443
79	Fluoranthene	206440					130 B, ee	140 B, ee		65FR66443

Priority Pollutant		CAS Number	Freshwater Aquatic Life		Saltwater Aquatic Life		Human Health			FR Cite/ Source
			CMC (µg/L)	CCC (µg/L)	CMC (µg/L)	CCC (µg/L)	For Consumption of: Water & Organism (µg/L)	Organism Only (µg/L)	MCL (µg/L)	
80	Fluorene	86737					1,100 B, ee	5,300 B, ee		65FR66443
81	Hexachlorobenzene	118741					0.00028 B, C	0.00029 B, C	1 C	65FR66443 SDWA
82	Hexachlorobutadiene	87683					0.44 B, C	18 B, C		65FR66443
83	Hexachlorocyclo-pentadiene	77474					40 T, ee	1100 T, ee	50 ee	68FR75510 SDWA
84	Hexachloroethane	67721					1.4 B, C	3.3 B, C		65FR66443
85	Indeno 1,2,3(cd) Pyrene	193395					0.0038 B, C	0.018 B, C		65FR66443
86	Isophorone	78591					35 B, C	960 B, C		65FR66443
87	Nitrobenzene	98953					17 B, ee	690 B, H, T, ee		65FR66443
88	N-Nitrosodimethylamine	62759					0.00069 B, C	3.0 B, C		65FR66443
89	N-Nitrosodi-n-Propylamine	621647					0.0050 B, C	0.51 B, C		65FR66443
90	N-Nitrosodiphenylamine	86306					3.3 B, C	6.0 B, C		65FR66443
91	Pyrene	129000					830 B, ee	4,000 B, ee		65FR66443

Priority Pollutant		CAS Number	Freshwater Aquatic Life		Saltwater Aquatic Life		Human Health			FR Cite/ Source
			CMC (µg/L)	CCC (µg/L)	CMC (µg/L)	CCC (µg/L)	For Consumption of: Water & Organism (µg/L)	Organism Only (µg/L)	MCL (µg/L)	
92	1, 2, 4-Trichlorobenzene	120821					35 ee	70 ee	70 ee	68FR75510 SDWA
93	Aldrin	309002	3.0 G, X		1.3 G, X		0.000049 B, C	0.000050 B, C		65FR31682 65FR66443
94	alpha-BHC	319846					0.0026 B, C	0.0049 B, C		65FR66443
95	beta-BHC	319857					0.0091 B, C	0.017 B, C		65FR66443
96	gamma-BHC (Lindane)	58899	0.95 K		0.16 G		0.98 ee	1.8 ee	0.2 C	65FR31682 68FR75510 SDWA
97	Chlordane	57749	2.4 G	0.0043 G, X	0.09 G	0.004 G, X	0.00080 B, C	0.00081 B, C	2 C	65FR31682 65FR66443 SDWA
98	4, 4'-DDT	50293	1.1 G, gg	0.001 G, X, gg	0.13 G, gg	0.001 G, X, gg	0.00022 B, C	0.00022 B, C		65FR31682 65FR66443
99	4, 4'-DDE	72559					0.00022 B, C	0.00022 B, C		65FR66443
100	4, 4'-DDD	72548					0.00031 B, C	0.00031 B, C		65FR66443
101	Dieldrin	60571	0.24 K	0.056 K, N	0.71 G	0.0019 G, X	0.000052 B, C	0.000054 B, C		65FR31682 65FR66443
102	alpha-Endosulfan	959988	0.22 G, W	0.056 G, W	0.034 G, W	0.0087 G, W	62 B, ee	89 B, ee		65FR31682 65FR66443

Priority Pollutant		CAS Number	Freshwater Aquatic Life		Saltwater Aquatic Life		Human Health			FR Cite/ Source
			CMC (µg/L)	CCC (µg/L)	CMC (µg/L)	CCC (µg/L)	For Consumption of: Water & Organism (µg/L)	Organism Only (µg/L)	MCL (µg/L)	
103	beta-Endosulfan	33213659	0.22 G, W	0.056 G, W	0.034 G, W	0.0087 G, W	62 B, ee	89 B, ee		65FR31682 65FR66443
104	Endosulfan Sulfate	1031078					62 B, ee	89 B, ee		65FR31682 65FR66443
105	Endrin	72208	0.086 K	0.036 K, N	0.037 G	0.0023 G, X	0.059 ee	0.060 ee	2 ee	68FR75510 SDWA
106	Endrin Aldehyde	7421934					0.29 B, ee	0.30 B, H, ee		65FR66443
107	Heptachlor	76448	0.52 G	0.0038 G, X	0.053 G	0.0036 G, X	0.000079 B, C	0.000079 B, C	0.4 C	65FR31682 65FR66443 SDWA
108	Heptachlor Epoxide	1024573	0.52 G, U	0.0038 G, U, X	0.053 G, U	0.0036 G, U, X	0.000039 B, C	0.000039B, C	0.2 C	65FR31682 65FR66443 SDWA
109	Polychlorinated Biphenyls PCBs	--		0.014 M, X		0.03 M, X	0.000064 B, C, M	0.000064 B, C, M	0.5 C	65FR31682 65FR66443 SDWA
110	Toxaphene	8001352	0.73	0.0002 X	0.21	0.0002 X	0.00028 B, C	0.00028 B, C	3 C	65FR31682 65FR66443 SDWA

Footnotes:

A This water quality criterion was derived from data for arsenic (III), but is applied here to total arsenic, which might imply that arsenic (III) and arsenic (V) are equally toxic to aquatic life and that their toxicities are additive. In the arsenic criteria document (EPA 440/5-84-033, January 1985), Species Mean Acute Values are given for both arsenic (III) and arsenic (V) for five species and the ratios of the SMAVs for each species range from 0.6 to 1.7. Chronic values are available for both arsenic (III) and arsenic (V) for one species; for the fathead minnow, the chronic value for arsenic (V) is 0.29 times the chronic value for arsenic (III). No data are known to be available concerning whether the toxicities of the forms of arsenic to aquatic organisms are additive.

B This criterion has been revised to reflect The Environmental Protection Agency's q1* or RfD, as contained in the Integrated Risk Information System (IRIS) as of May 17, 2002. The fish tissue bioconcentration factor (BCF) from the 1980 Ambient Water Quality Criteria document was retained in each case.

C This criterion is based on carcinogenicity of 10^{-6} risk. As prescribed in Section E of this regulation, application of this criterion for permit effluent limitations requires the use annual average flow or comparable tidal condition as determined by the Department.

D Freshwater and saltwater criteria for metals are expressed in terms of total recoverable metals. As allowed in Section E of this regulation, these criteria may be expressed as dissolved metal for the purposes of deriving permit effluent limitations. The dissolved metal water quality criteria value may be calculated by using these 304(a) aquatic life criteria expressed in terms of total recoverable metal, and multiplying it by a conversion factor (CF). The term "Conversion Factor" (CF) represents the conversion factor for converting a metal criterion expressed as the total recoverable fraction in the water column to a criterion expressed as the dissolved fraction in the water column. (Conversion Factors for saltwater CCCs are not currently available. Conversion factors derived for saltwater CMCs have been used for both saltwater CMCs and CCCs). See "Office of Water Policy and Technical Guidance on Interpretation and Implementation of Aquatic Life Metals Criteria", October 1, 1993, by Martha G. Prothro, Acting Assistant Administrator for Water, available from the Water Resource center, USEPA, 401 M St., SW, mail code RC4100, Washington, DC 20460; and 40CFR§131.36(b)(1). Conversion Factors can be found in Attachment 1 – Conversion Factors for Dissolved Metals.

E The freshwater criterion for this metal is expressed as a function of hardness (mg/L) in the water column. The value given here corresponds to a hardness of 25 mg/L as expressed as $CaCO_3$. Criteria values for other hardness may be calculated from the following: CMC (dissolved) = $\exp\{m_A [\ln(\text{hardness})] + b_A\}$ (CF), or CCC (dissolved) = $\exp\{m_C [\ln(\text{hardness})] + b_C\}$ (CF) and the parameters specified in Attachment 2 – Parameters for Calculating Freshwater Dissolved Metals Criteria That Are Hardness-Dependent. As noted in footnote D above, the values in this appendix are expressed as total recoverable, the criterion may be calculated from the following: CMC (total) = $\exp\{m_A [\ln(\text{hardness})] + b_A\}$, or CCC (total) = $\exp\{m_C [\ln(\text{hardness})] + b_C\}$.

F Freshwater aquatic life values for pentachlorophenol are expressed as a function of pH, and are calculated as follows: CMC = exp(1.005(pH)-4.869); CCC = exp(1.005(pH)-5.134). Values displayed in table correspond to a pH of 7.8.

G This criterion is based on 304(a) aquatic life criterion issued in 1980, and was issued in one of the following documents: Aldrin/Dieldrin (EPA 440/5-80-019), Chlordane (EPA 440/5-80-027), DDT (EPA 440/5-80-038), Endosulfan (EPA 440/5-80-046), Endrin (EPA 440/5-80-047), Heptachlor (440/5-80-052), Hexachlorocyclohexane (EPA 440/5-80-054), Silver (EPA 440/5-80-071). The Minimum Data Requirements and derivation procedures were different in the 1980 Guidelines than in the 1985 Guidelines. For example, a "CMC" derived using the 1980 Guidelines was derived to be used as an instantaneous maximum. If assessment is to be done using an averaging period, the values given should be divided by 2 to obtain a value that is more comparable to a CMC derived using the 1985 Guidelines.

H No criterion for protection of human health from consumption of aquatic organisms excluding water was presented in the 1980 criteria document or in the *1986 Quality Criteria for Water*. Nevertheless, sufficient information was presented in the 1980 document to allow the calculation of a criterion, even though the results of such a calculation were not shown in the document.

I This criterion for asbestos is the Maximum Contaminant Level (MCL) developed under the Safe Drinking Water Act (SDWA) and the National Primary Drinking Water Regulation (NPDWR).

J EPA has not calculated a 304(a) human health criterion for this contaminant. The criterion is the Maximum Contaminant Level developed under the Safe Drinking Water Act (SDWA) and the National Primary Drinking Water Regulation (NPDWR).

K This criterion is based on a 304(a) aquatic life criterion that was issued in the *1995 Updates: Water Quality Criteria Documents for the Protection of Aquatic Life in Ambient Water*, (EPA-820-B-96-001, September 1996). This value was derived using the GLI Guidelines (60FR15393-15399, March 23, 1995; 40CFR132 Appendix A); the difference between the 1985 Guidelines and the GLI Guidelines are explained on page iv of the 1995 Updates. None of the decisions concerning the derivation of this criterion were affected by any considerations that are specific to the Great Lakes.

L The CMC = 1/[(f1/CMC1) + (f2/CMC2)] where f1 and f2 are the fractions of total selenium that are treated as selenite and selenate, respectively, and CMC1 and CMC2 are 185.9 µg /l and 12.82 µg /l, respectively.

M This criterion applies to total PCBs, (e.g., the sum of all congener or all isomer or homolog or Aroclor analyses.)

N The derivation of the CCC for this pollutant did not consider exposure through the diet, which is probably important for aquatic life occupying upper trophic levels.

O This state criterion is also based on a total fish consumption rate of 0.0175 kg/day.

P This water quality criterion is expressed asµg free cyanide (as CN)/L.

Q This value was announced (61FR58444-58449, November 14, 1996) as a proposed GLI 303 I aquatic life criterion

S This water quality criterion for selenium is expressed in terms of total recoverable metal in the water column. It is scientifically acceptable to use the conversion factor (0.996 – CMC or 0.922 – CCC) that was used in the GLI to convert this to a value that is expressed in terms of dissolved metal.

T The organoleptic effect criterion is more stringent than the value for priority toxic pollutants.

U This value was derived from data for heptachlor and the criteria document provides insufficient data to estimate the relative toxicities of heptachlor and heptachlor epoxide.

V There is a full set of aquatic life toxicity data that show that DEHP is not toxic to aquatic organisms at or below its solubility limit.

W This value was derived from data for endosulfan and is most appropriately applied to the sum of alpha-endosulfan and beta-endosulfan.

X This criterion is based on a 304(a) aquatic life criterion issued in 1980 or 1986, and was issued in one of the following documents: Aldrin/Dieldrin (EPA440/5-80-019), Chlordane (EPA 440/5-80-027), DDT (EPA 440/5-80-038), Endrin (EPA 440/5-80-047), Heptachlor (EPA 440/5-80-052), Polychlorinated Biphenyls (EPA 440/5- 80-068), Toxaphene (EPA 440/5-86-006). This CCC is based on the Final Residue value procedure in the 1985 Guidelines. Since the publication of the Great Lakes Aquatic Life Criteria Guidelines in 1995 (60FR15393-15399, March 23, 1995), the EPA no longer uses the Final Residue value procedure for deriving CCCs for new or revised 304(a) aquatic life criteria.

Y This water quality criterion is based on a 304(a) aquatic life criterion that was derived using the 1985 Guidelines (*Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and Their Uses*, PB85-227049, January 1985) and was issued in one of the following criteria documents: Arsenic (EPA 440/5-84-033), Cadmium (EPA 440/5-84-032), Chromium (EPA 440/5-84-029), Copper (EPA 440/5-84-031), Cyanide (EPA 440/5-84-028), Lead (EPA 440/5-84-027), Nickel (EPA 440/5-86-004), Pentachlorophenol (EPA 440/5-86-009), Toxaphene, (EPA 440/5-86-006), Zinc (EPA 440/5-87- 003).

Z When the concentration of dissolved organic carbon is elevated, copper is substantially less toxic and use of Water-Effect Ratios might be appropriate.

aa The selenium criteria document (EPA 440/5-87-006, September 1987) provides that if selenium is as toxic to saltwater fishes in the field as it is to freshwater fishes in the field, the status of the fish community should be monitored whenever the concentration of selenium exceeds 5.0 □g/L in salt water because the saltwater CCC does not take into account uptake via the food chain.

bb This water quality criterion was derived on page 43 of the mercury criteria document (EPA 440/5-84-026, January 1985). The saltwater CCC of 0.025 ug/L given on page 23 of the criteria document is based on the Final Residue value procedure in the 1985 Guidelines. Since the publication of the Great Lakes Aquatic Life criteria Guidelines in 1995 (60FR15393-15399, March 23, 1995), the EPA no longer uses the Final Residue value procedure for deriving CCCs for new or revised 304(a) aquatic life criteria.

cc This water quality criterion was derived in *Ambient Water Quality Criteria Saltwater Copper Addendum* (Draft, April 14, 1995) and was promulgated in the Interim Final National Toxics Rule (60FR22228-222237, May 4, 1995).

dd This water quality criterion was derived from data for inorganic mercury (II), but is applied here to total mercury. If a substantial portion of the mercury in the water column is methylmercury, this criterion will probably be under protective. In addition, even though inorganic mercury is converted to methylmercury and methylmercury bioaccumulates to a great extent, this criterion does not account for uptake via the food chain because sufficient data were not available when the criterion was derived.

ee This criterion is a noncarcinogen. As prescribed in Section E of this regulation, application of this criterion for determining permit effluent limitations requires the use of 7Q10 or comparable tidal condition as determined by the Department.

gg This criterion applies to DDT and its metabolites (i.e., the total concentration of DDT and its metabolites should not exceed this value).

hh Although a new RfD is available in IRIS, the surface water criteria will not be revised until the National Primary Drinking Water Regulations: Stage 2 Disinfectants and Disinfection Byproducts Rule (Stage 2 DBPR) is completed, since public comment on the relative source contribution (RSC) for chloroform is anticipated.

ii Although EPA has not published a completed criteria document for phthalate, it is EPA's understanding that sufficient data exist to allow calculation of aquatic life criteria.

jj This recommended water quality criterion is expressed as total cyanide, even though the IRIS RfD the EPA used to derive the criterion is based on free cyanide. The multiple forms of cyanide that are present in ambient water have significant differences in toxicity due to their abilities to liberate the CN-moiety. Some complex cyanides require even more extreme conditions than refluxing with sulfuric acid to liberate the CN-moiety. Thus, these complex cyanides are expected to have little or no 'bioavailalbility' to humans. If a substantial fraction of the cyanide present in a water body is present in a complexed form (e.g.,$FE_4[FE(CN)_6]_3$), this criterion may be overly conservative.

kk This recommended water quality criterion was derived using the cancer slope factor of 1.4 (Linear multi-stage model (LMS) exposure from birth).

ll Freshwater copper criteria may be calculated utilizing the procedures identified in EPA-822-R-07-001.

mm HAA5 means five haloacetic acids (monochloracitic acid, dichloroacetic acid, trichloroacetic acid, bromoacetic acid and dibromoaccetic acid).

nn This criterion has been revised to reflect the EPA's cancer slope factor (CSF) or reference dose (RfD), as contained in the Integrated Risk Information System (IRIS) as of (Final FR Notice June 10, 2009). The fish tissue bioconcentration factor (BCF) from the 1980 Ambient Water Quality Criteria document was retained in each case.

NON PRIORITY POLLUTANTS

	Non Priority Pollutant	CAS Number	Freshwater Aquatic Life		Saltwater Aquatic Life		Human Health			FR Cite/Source
			CMC (µg/L)	CCC (µg/L)	CMC (µg/L)	CCC (µg/L)	For Consumption of: Water & Organism (µg/L)	Organism Only (µg/L)	MCL (µg/L)	
1	Alachlor								2 M	SDWA
2	Ammonia	7664417	CRITERIA ARE pH AND TEMPERATURE DEPENDENT - SEE DOCUMENT FOR DETAILS C							EPA822-R99-014 EPA440/5-88-004
3	Aesthetic Qualities		NARRATIVE STATEMENT AND NUMERIC CRITERIA – SEE TEXT							Gold Book
4	Atrazine								3 M	SDWA
5	Bacteria		FOR PRIMARY CONTACT RECREATION AND SHELLFISH USES – SEE TEXT							Gold Book
6	Barium	7440393					1,000 A, L		2,000 L	Gold Book
7	Carbofuran	1563662							40 L	SDWA
8	Chlorine	7782505	19	11	13	7.5			G	Gold Book SDWA
9	Chlorophenoxy Herbicide 2, 4, 5, -TP	93721					10 A, L		50 L	Gold Book SDWA
10	Chlorophenoxy Herbicide 2, 4-D	94757					100 A, L		70 L	Gold Book SDWA
11	Chlorophyll *a*		NARRATIVE STATEMENT AND NUMERIC CRITERIA – SEE TEXT							State Standard
12	Chloropyrifos	2921882	0.083 F	0.041 F	0.011 F	0.0056 F				Gold Book
13	Color		NARRATIVE STATEMENT – SEE TEXT							State Standard

Non Priority Pollutant		CAS Number	Freshwater Aquatic Life		Saltwater Aquatic Life		Human Health			FR Cite/Source
			CMC (µg/L)	CCC (µg/L)	CMC (µg/L)	CCC (µg/L)	For Consumption of: Water & Organism (µg/L)	Organism Only (µg/L)	MCL (µg/L)	
14	Dalapon	75990							200 L	SDWA
15	Demeton	8065483		0.1 E		0.1 E				Gold Book
16	1,2-Dibromo-3-chloropropane (DBCP)	96128							0.2 M	SDWA
17	Di(2-ethylhexyl) adipate	103231							400 L	SDWA
18	Dinoseb	88857							7 L	SDWA
19	Dinitrophenols	25550587					69 L	5,300 L		65FR66443
20	Nonylphenol	1044051	28	6.6	7.0	1.7				71FR9337
21	Diquat	85007							20 L	SDWA
22	Endothall	145733							100 L	SDWA
23	Ether, Bis Chloromethyl	542881					0.00010 D, M	0.00029 D, M		65FR66443
24	Cis-1, 2-dichloroethylene	156592							70 L	SDWA
25	Ethylene dibromide								0.05 M	SDWA

Non Priority Pollutant		CAS Number	Freshwater Aquatic Life		Saltwater Aquatic Life		Human Health			FR Cite/Source
			CMC (µg/L)	CCC (µg/L)	CMC (µg/L)	CCC (µg/L)	For Consumption of: Water & Organism (µg/L)	Organism Only (µg/L)	MCL (µg/L)	
26	Fluoride	7681494							4000 L	SDWA
27	Glyphosate	1071836							700 L	SDWA
28	Guthion	86500		0.01 E		0.01 E				Gold Book
29	Hexachlorocyclo-hexane-Technical	319868					0.0123 L	0.0414 L		Gold Book
30	Malathion	121755		0.1 E		0.1 E				Gold Book
31	Methoxychlor	72435		0.03 E		0.03 E	100 A, L		40 L	Gold Book SDWA
32	Mirex	2385855		0.001 E		0.001 E				Gold Book
33	Nitrates	14797558					10, 000 L		10, 000 L	SDWA Gold Book
34	Nitrites	14797650							1,000 L	SDWA
35	Nitrogen, Total		NARRATIVE STATEMENT AND NUMERIC CRITERIA - SEE TEXT							State Standard
36	Nitrosamines						0.0008 L	1.24 L		Gold Book
37	Nitrosodibutylamine, N	924163					0.0063 A, M	0.22 A, M		65FR66443

Non Priority Pollutant		CAS Number	Freshwater Aquatic Life		Saltwater Aquatic Life		Human Health			FR Cite/Source
			CMC (µg/L)	CCC (µg/L)	CMC (µg/L)	CCC (µg/L)	For Consumption of: Water & Organism (µg/L)	Organism Only (µg/L)	MCL (µg/L)	
38	Nitrosodiethylamine, N	55185					0.0008 A, M	1.24 A, M		Gold Book
39	Nitrosopyrrolidine, N	930552					0.016 M	34 M		65FR66443
40	Oil and Grease		NARRATIVE STATEMENT – SEE TEXT							Gold Book
41	Oxamyl	23135220							200 L	SDWA
42	Oxygen, Dissolved	7782447	WARMWATER, COLDWATER, AND EXCEPTIONS FOR NATURAL CONDITIONS - SEE TEXT K							Gold Book State Standard
43	Diazinon	333415	0.17	0.17	0.82	0.82				71FR9336
44	Parathion	56382	0.065 H	0.013 H						Gold Book
45	Pentachlorobenzene	608935					1.4 E	1.5 E		65FR66443
46	pH		SEE TEXT I							Gold Book State Standard
47	Phosphorus, Total		NARRATIVE STATEMENT AND NUMERIC CRITERIA - SEE TEXT							State Standard
48	Picloram	1918021							500 L	SDWA
49	Salinity		NARRATIVE STATEMENT - SEE TEXT							Gold Book
50	Simazine	122349							4 L	SDWA

Non Priority Pollutant		CAS Number	Freshwater Aquatic Life		Saltwater Aquatic Life		Human Health			FR Cite/Source
			CMC (µg/L)	CCC (µg/L)	CMC (µg/L)	CCC (µg/L)	For Consumption of: Water & Organism (µg/L)	Organism Only (µg/L)	MCL (µg/L)	
51	Solids,Suspended,and Turbidity		NARRATIVE STATEMENT AND NUMERIC CRITERIA - SEE TEXT							Gold Book State Standard
52	Styrene	100425							100 L	SDWA
53	Sulfide-Hydrogen Sulfide	7783064		2.0 E		2.0 E				Gold Book
54	Tainting Substances		NARRATIVE STATEMENT - SEE TEXT							Gold Book
55	Temperature		SPECIES DEPENDENT CRITERIA - SEE TEXT J							Red Book
56	1, 2, 4, 5-Tetrachlorobenzene	95943					0.97 D	1.1 D		65FR66443
57	Tributyltin (TBT)	688733	0.46	0.063	0.37	0.010				EPA 822-F-00-008
58	2, 4, 5-Trichlorophenol	95954					1,800 B, D	3,600 B, D		65FR66443
59	Xylenes, Total								10, 000 L	SDWA
60	Uranium								30	SDWA
61	Beta particles and photon emitters								4 Millirems/ yr	SDWA
62	Gross alpha particle activity								15 picocuries per liter (pCi/l)	SDWA

	Non Priority Pollutant	CAS Number	Freshwater Aquatic Life		Saltwater Aquatic Life		Human Health			FR Cite/Source
							For Consumption of:			
			CMC (µg/L)	CCC (µg/L)	CMC (µg/L)	CCC (µg/L)	Water & Organism (µg/L)	Organism Only (µg/L)	MCL (µg/L)	
63	Radium 226 and Radium 228 (combined)								5 pCi/l	SDWA

Footnotes:

A This human health criterion is the same as originally published in the Red Book which predates the 1980 methodology and did not utilize the fish ingestion BCF approach. This same criterion value is now published in the Gold Book.

B The organoleptic effect criterion is more stringent than the value presented in the non priority pollutants table.

C According to the procedures described in the *Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and Their Uses*, except possibly where a very sensitive species is important at a site, freshwater aquatic life should be protected if both conditions specified in Attachment 3 - Calculation of Freshwater Ammonia Criterion are satisfied.

D This criterion has been revised to reflect The Environmental Protection Agency's q1* or RfD, as contained in the Integrated Risk Information System (IRIS) as of April 8, 1998. The fish tissue bioconcentration factor (BCF) used to derive the original criterion was retained in each case.

E The derivation of this value is presented in the Red Book (EPA 440/9-76-023, July, 1976).

F This value is based on a 304(a) aquatic life criterion that was derived using the 1985 Guidelines (*Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and Their Uses*, PB85-227049, January 1985) and was issued in the following criteria document: Chloropyrifos (EPA 440/5-86-005).

G A more stringent Maximum Residual Disinfection Level (MRDL) has been issued by EPA under the Safe Drinking Water Act. Refer to S.C. Regulation 61-58, *State Primary Drinking Water Regulations*.

H This value is based on a 304(a) aquatic life criterion that was issued in the *1995 Updates: Water Quality Criteria Documents for the Protection of Aquatic Life in Ambient Water* (EPA-820-B-96-001). This value was derived using the GLI Guidelines (60FR15393-15399, March 23, 1995; 40CFR132 Appendix A); the differences between the 1985 Guidelines and the GLI Guidelines are explained on page iv of the 1995 Updates. No decision concerning this criterion was affected by any considerations that are specific to the Great Lakes.

I South Carolina has established some site-specific standards for pH. These site-specific standards are listed in S.C. Regulation 61-69, *Classified Waters*.

J U.S. EPA, 1976, Quality Criteria for Water 1976.

K South Carolina has established numeric criteria in Section G for waters of the State based on the protection of warmwater and coldwater species. For the exception to be used for waters of the State that do not meet the numeric criteria established for the waterbody due to natural conditions, South Carolina has specified the allowable deficit in Section D.4. and used the following document as a source. U.S. EPA, 1986, Ambient Water Quality Criteria for Dissolved Oxygen, EPA 440/5-86-003, National Technical Information Service, Springfield, VA. South Carolina has established some site-specific standards for DO. These site-specific standards are listed in S.C. Regulation 61-69*, Classified Waters*.

L This criterion is a noncarcinogen. As prescribed in Section E of this regulation, application of this criterion for determining permit effluent limitations requires the use of 7Q10 or comparable tidal condition as determined by the Department

M This criterion is based on an added carcinogenicity risk. As prescribed in Section E of this regulation, application of this criterion for permit effluent limitations requires the use annual average flow or comparable tidal condition as determined by the Department.

ORGANOLEPTIC EFFECTS

Pollutant		CAS Number	Organoleptic Effect Criteria (µg/L)	FR Cite/Source
1	Acenaphthene	83329	20	Gold Book
2	Chlorobenzene	108907	20	Gold Book
3	3-Chlorophenol		0.1	Gold Book
4	4-Chlorophenol	106489	0.1	Gold Book
5	2, 3-Dichlorophenol		0.04	Gold Book
6	2, 5-Dichlorophenol		0.5	Gold Book
7	2, 6-Dichlorophenol		0.2	Gold Book
8	3, 4-Dichlorophenol		0.3	Gold Book
9	2, 4, 5-Trichlorophenol	95954	1	Gold Book
10	2, 4, 6-Trichlorophenol	88062	2	Gold Book
11	2, 3, 4, 6-Tetrachlorophenol		1	Gold Book
12	2-Methyl-4-Chlorophenol		1,800	Gold Book
13	3-Methyl-4-Chlorophenol	59507	3,000	Gold Book
14	3-Methyl-6-Chlorophenol		20	Gold Book
15	2-Chlorophenol	95578	0.1	Gold Book
16	Copper	7440508	1,000	Gold Book
17	2, 4-Dichlorophenol	120832	0.3	Gold Book

Pollutant		CAS Number	Organoleptic Effect Criteria (µg/L)	FR Cite/Source
18	2, 4-Dimethylphenol	105679	400	Gold Book
19	Hexachlorocyclopentadiene	77474	1	Gold Book
20	Nitrobenzene	98953	30	Gold Book
21	Pentachlorophenol	87865	30	Gold Book
22	Phenol	108952	300	Gold Book
23	Zinc	7440666	5,000	45FR79341

Footnote:

These criteria are based on organoleptic (taste and odor) effects. Because of variations in chemical nomenclature systems, this listing of pollutants does not duplicate the listing in Appendix A of 40 CFR Part 423. Also listed are the Chemical Abstracts Service (CAS) registry numbers, which provide a unique identification for each chemical.

WATER QUALITY CRITERIA ADDITIONAL NOTES

1. Criteria Maximum Concentration and Criterion Continuous Concentration
The Criteria Maximum Concentration (CMC) is an estimate of the highest concentration of a material in surface water to which an aquatic community can be exposed briefly without resulting in an unacceptable effect. The Criterion Continuous Concentration (CCC) is an estimate of the highest concentration of a material in surface water to which an aquatic community can be exposed indefinitely without resulting in an unacceptable effect. The CMC and CCC are just two of the six parts of a aquatic life criterion; the other four parts are the acute averaging period, chronic averaging period, acute frequency of allowed exceedence, and chronic frequency of allowed exceedence.

2. Criteria for Priority Pollutants, Non Priority Pollutants and Organoleptic Effects
This appendix lists all priority toxic pollutants and some nonpriority toxic pollutants, and both human health effect and organoleptic effect criteria issued pursuant to CWA §304(a), the SDWA, and the NPDWR. Blank spaces indicate that EPA has no CWA §304(a) criteria recommendations. Because of variations in chemical nomenclature systems, this listing of toxic pollutants does not duplicate the listing in Appendix A of 40CFR Part 423.

3. Human Health Risk
The human health criteria for the priority and non priority pollutants are based on carcinogenicity of 10^{-6} risk.

4. Water Quality Criteria published pursuant to Section 304(a) or Section 303(c) of the CWA
Many of the values in the appendix were published in the California Toxics Rule. Although such values were published pursuant to Section 303(c) of the CWA, they represent the EPA's most recent calculation of water quality criteria.

5. Calculation of Dissolved Metals Criteria
The 304(a) criteria for metals are shown as total recoverable metals. As allowed in Section E of this regulation, these criteria may be expressed as dissolved metals. Dissolved metals criteria may be calculated in one of two ways (please refer to Attachments). For freshwater metals criteria that are hardness-dependent, the dissolved metal criteria may be calculated using a hardness of 25 mg/l as expressed as $CaCO_3$. Saltwater and freshwater metals' criteria that are not hardness-dependent are calculated by multiplying the total recoverable criteria before rounding by the appropriate conversion factors. The final metals' criteria in the table are rounded to two significant figures. Information regarding the calculation of hardness dependent conversion factors are included in the footnotes.

6. Chemical Abstract Services Number
The Chemical Abstract Services number (CAS) for each pollutant is provided (where available).

7. Gold Book Reference
The Gold Book reference listed in the appendix refers to the May 1, 1986 EPA publication EPA 440/5-86-001.

8. Federal Register Reference
The FR listed in the appendix refers to the appropriate *Federal Register* listing. and source refers to the origin of the value. Many of the numeric values contained in this appendix have been modified, revised, or altered and therefore, the source as listed may not be the same as it appears in this table. Also, South Carolina may have selected to use a different value or may have promulgated a different value in its previous iterations of this regulation, so differences from these sources should be expected.

9. Maximum Contaminant Levels
The appendix includes Maximum Contaminant Levels (MCLs) developed under the Safe Drinking Water Act (SDWA) and the National Primary Drinking Water Regulation (NPDWR).

10. Organoleptic Effects
The appendix contains 304(a) criteria for pollutants with toxicity-based criteria as well as non-toxicity based criteria. The basis for the non-toxicity based criteria are organoleptic effects (e.g., taste and odor) which would make water and edible aquatic life unpalatable but not toxic to humans. The table includes criteria for organoleptic effects for 23

pollutants. Pollutants with organoleptic effect criteria more stringent than the criteria based on toxicity (e.g., included in both the priority and non-priority pollutant tables) are footnoted as such.

11. Category Criteria

In the 1980 criteria documents, certain water quality criteria were published for categories of pollutants rather than for individual pollutants within that category. Subsequently, in a series of separate actions, the EPA derived criteria for specific pollutants within a category. Therefore, in this appendix South Carolina is replacing criteria representing categories with individual pollutant criteria (e.g., 1, 3-dichlorobenzene, 1, 4-dichlorobenzene and 1, 2-dichlorobenzene).

12. Specific Chemical Calculations

A. Selenium

(1) Human Health

In the 1980 Selenium document, a criterion for the protection of human health from consumption of water and organisms was calculated based on a BCF of 6.0 l/kg and a maximum water-related contribution of 35 Φg Se/day. Subsequently, the EPA Office of Health and Environmental Assessment issued an errata notice (February 23, 1982), revising the BCF for selenium to 4.8 L/kg. In 1988, EPA issued an addendum (ECAO-CIN-668) revising the human health criteria for selenium. Later in the final National Toxic Rule (NTR, 57 FR 60848), EPA withdrew previously published selenium human health criteria, pending EPA review of new epidemiological data.

This appendix includes human health criteria for selenium, calculated using a BCF of 4.8 L/kg along with the current IRIS RfD of 0.005 mg/kg/day. South Carolina included these water quality criteria in the appendix because the data necessary for calculating a criteria in accordance with EPA's 1980 human health methodology are available.

(2) Aquatic Life

This appendix contains aquatic life criteria for selenium that are the same as those published in the CTR. In the CTR, EPA proposed an acute criterion for selenium based on the criterion proposed for selenium in the Water Quality Guidance for the Great Lakes System (61FR584440. The GLI and CTR proposals take into account data showing that selenium's two prevalent oxidation state in water, selenite and selenate, present differing potentials for aquatic toxicity, as well as new data indication that various forms of selenium are additive. The new approach produces a different selenium acute criterion concentration, or CMC, depending upon the relative proportions of selenite, selenate, and other forms of selenium that are present. EPA is currently undertaking a reassessment of selenium, and expects the 304(a) criterion for selenium will be revised based on the final reassessment (63FR26186). However, until such time as revised water quality criteria for selenium are published by the EPA, the water quality criteria in this appendix are EPA's current 304(a) criteria.

B. Chromium (III)

The aquatic life water quality criteria for chromium (III) included in the appendix are based on the values presented in the document titled: *1995 Updates: Water Quality Criteria Documents for the Protection of Aquatic Life in Ambient Water*.

C. PCBs

In this appendix, South Carolina is publishing aquatic life and human health criteria based on total PCBs rather than individual arochlors.

Attachment 1 - Conversion Factors for Dissolved Metals

Metal	Conversion Factor freshwater CMC	Conversion Factor freshwater CCC	Conversion Factor saltwater CMC	Conversion Factor saltwater CCC
Arsenic	1.000	1.000	1.000	1.000
Cadmium	1.136672-[(ln hardness)(0.041838)]	1.101672-[(ln hardness)(0.041838)]	0.994	0.994
Chromium III	0.316	0.860	--	--
Chromium VI	0.982	0.962	0.993	0.993
Copper	0.960	0.960	0.83	0.83
Lead	1.46203-[(ln hardness)(0.145712)]	1.46203-[(ln hardness)(0.145712)]	0.951	0.951
Mercury	0.85	0.85	0.85	0.85
Nickel	0.998	0.997	0.990	0.990
Selenium	--	--	0.998	0.998
Silver	0.85	--	0.85	--
Zinc	0.978	0.986	0.946	0.946

Attachment 2 - Parameters for Calculating Freshwater Dissolved Metals Criteria That Are Hardness-Dependent

Chemical	m_A	b_A	m_C	b_C	Freshwater Conversion Factors (CF)	
					Acute	Chronic
Cadmium	1.0166	-3.924	0.7409	-4.719	1.136672-[ln (hardness)(0.041838)]	1.101672-[ln (hardness)(0.041838)]
Chromium III	0.8190	3.7256	0.8190	0.6848	0.316	0.860
Copper	0.9422	-1.700	0.8545	-1.702	0.960	0.960
Lead	1.273	-1.460	1.273	-4.705	1.46203-[ln (hardness)(0.145712)]	1.46203-[ln (hardness)(0.145712)]
Nickel	0.8460	2.255	0.8460	0.0584	0.998	0.997
Silver	1.72	-6.52	--	--	0.85	--
Zinc	0.8473	0.884	0.8473	0.884	0.978	0.986

Hardness-dependent metals criteria may be calculated from the following:
CMC (total) = $\exp\{m_A [\ln(\text{hardness})] + b_A\}$, or CCC (total) = $\exp\{m_C [\ln(\text{hardness})] + b_C\}$
CMC (dissolved) = $\exp\{m_A [\ln(\text{hardness})] + b_A\}$ (CF), or CCC (dissolved) = $\exp\{m_C [\ln(\text{hardness})] + b_C\}$ (CF).

Attachment 3 - Calculation of Freshwater Ammonia Criterion

1. The one-hour average concentration of total ammonia nitrogen (in mg N/L) does not exceed, more than once every three years on the average, the CMC calculated using the following equation:

$$\text{CMC} = \frac{0.275}{1+10^{7.204-\text{pH}}} + \frac{39.0}{1+10^{\text{pH}-7.204}}$$

In situations where salmonids are absent, the CMC may be calculated using the following equation:

$$\text{CMC} = \frac{0.411}{1+10^{7.204-\text{pH}}} + \frac{58.4}{1+10^{\text{pH}-7.204}}$$

2. The thirty-day average concentration of total ammonia nitrogen (in mg N/L) does not exceed, more than once every three years on the average, the CCC calculated using the following equations:

When fish early life stages (ELS) are present:

$$\text{CCC} = \left(\frac{0.0577}{1+10^{7.688-\text{pH}}} + \frac{2.487}{1+10^{\text{pH}-7.688}}\right) \times \min\left(2.85, 1.45 \times 10^{0.028\times(25-\text{T})}\right)$$

When fish early life stages are absent:

$$\text{CCC} = \left(\frac{0.0577}{1+10^{7.688-\text{pH}}} + \frac{2.487}{1+10^{\text{pH}-7.688}}\right) \times 1.45 \times 10^{0.028\times(25-\max(\text{T},7))}$$

and the highest four-day average within the 30-day period does not exceed 2.5 times the CCC.

In the absence of information substantiating that ELS are absent, the ELS present equation will be used.