United States
Environmental Protection
Agency

Office of Water
Planning and Standard
Washington DC 20460

December 1979

Water

EPA

Bacteria

Water Quality Standards Criteria Digest A Compilation of State/Federal Criteria

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ENVIRONMENTAL PROTECTION AGENCY
WATER QUALITY STANDARDS
CRITERIA DIGEST - CORRECTIONS

In December 1979, EPA published four documents containing the summaries of State Water Quality Standards. In those four documents a number of errors appeared which need correction. These corrections are listed below.

ACIDITY-ALKALINITY (pH)

1. Idaho. Page 7: add as the first phrase the following general statement - Values for all waters are to be within the range of 6.5 - 9.0.

2. Mississippi. Page 11: delete the criteria and uses for agriculture, industrial, and navigation.

BACTERIA

1. Alabama. Page 1: for F & WL, change the geometric mean of 100/100 to 1,000/100.

2. Florida. Page 9: for PWS change 1,000/100 fecal coliforms to 1,000/100 total fecal coliforms.

3. Nevada. Page 19: (a) second paragraph, change intrastate to interstate. (b) under the more stringent criteria, change interstate to intrastate and add Class B with Class A.

4. Tennessee. Page 29: for PWS, change total to fecal, and for F & WL replace "no criteria" with "same as Class 1."

5. Utah. Page 31: Continues as:

Utah (cont'd) Class C (PWS after treatment; recreation, excepting swimming unless natural purification action results in quality consistent with class "CR" standard and swimming is specifically approved by State board of health): Monthly arithmetic mean total coliforms not to exceed 5,000/100, except 20% of samples may exceed this if no more than 5% exceed 20,000/100, and monthly arithmetic mean coliforms shall not exceed 2,000/100.

Class CR (swimming): Monthly arithmetic mean coliforms not exceed 1,000/100; no more than 20% exceed this and no more than 5% exceed 4,000/100; and monthly arithmetic mean fecal coliforms exceed 200/100, provided no more than 10% exceed 400/100.

Class D (limited irrigation, not including lawns, rec. areas, dairy pastures, root crops or low growing crops for human consumption): Monthly arithmetic mean coliforms not exceed 5,000/100, except 20% of samples may exceed this if no more than 5% exceed 20,000/100.

Vermont

Class A (PWS with disinfection): Total coliforms not exceed 100/100. Fecal coliform: none attributable to discharge of domestic or industrial wastes.

Class B (PWS with treatment; bathing): Total coliforms not exceed 500/100. Fecal coliform not exceed 200/100.

Class C (secondary contact recreation): Fecal coliforms not to exceed 1,000/100.

Virginia

In all surface waters, except those areas where public or leased private shellfish beds are present, the fecal coliform bacteria shall not exceed a log mean of 200/100 ml with not more than 10% of total samples during any 30-day period exceeding 400/100 ml. Evaluation should be determined by either multi-tube fermentation for marine waters or membrane filtration method for freshwaters and should be based upon not less than 10% of samples taken over not more than a 30-day period.

Shellfish - In all open ocean or estuarine waters capable of propagating shellfish or in specific areas where public or leased private shellfish beds are present, and including those waters on which condemnation or restricted classifications are established by State Department of Health, the following standard will aply: the median fecal coliform value for a sampling station shall not exceed an MPN of 14/100 of samples and not more than 10% of the samples shall exceed 43 for a 5-tube, 3-dilution test or 49 for a 3-tube, 3-dilution test.

DISSOLVED OXYGEN

1. Idaho. Page 8: substitute the given criteria with the following:

   Cold Water Fishery - exceed 6 mg/l at all times, minimum daily average will be 7 mg/l.

   Warm Water Fishery - exceed 5 mg/l at all times, minimum daily average will be 6 mg/l.

   Miscellaneous - Salmonid Spawning; exceed 90% of saturation or 6 mg/l, whichever is greater.

2. Mississippi. Page 13: Substitute the given criteria with the following:

   Dissolved oxygen concentrations shall be maintained at a daily average of not less than 5. mg/l with an instantaneous nimimum of not less than 4.0 mg/l in streams; shall be maintained at a daily average of not less than 5.0 mg/l with an instantaneous minimum of not less than 4.0 mg/l in estuaries and in the tidally-affected portions of streams; and shall be maintained at a daily average of not less than 5.0 mg/l with an instantaneous minimum of not less than 4.0 mg/l in the epilimnion (i.e., the surface layer of lakes and impounments that are thermally stratified, or 5 feet from the water's surface (mid-depth if the lake or impoundment is less than 10 feet deep at the point of sampling) for lakes, and impoundments that are not stratified.

   Epilimnion samples may be collected at the approximate mid-point of that zone (i.e., the mid point of the distance or if the epilimnion is more than 5 feet in depth, then at 5 feet from the water's surface.

   (Applicable to all classes).

3. Oregon. Page 17: Replace the Cold Water Fishery criteria of 75% with 90% and delete the phrase "or 5-7 mg/l."

DISSOLVED SOLIDS

1. Arizona. Page 1: Delete the phrase for no requirements. Also, in the last sentence of paragraph change "goals" to "standards."

2. Kentucky. Page 10: Delete the use and criteria for industrial water supply.

3. North Carolina. Page 16: Replace the phrase for no requirements with Class A-II: total dissolved solids - 500 mg/l; sulfates - 250 mg/l.

INTRODUCTION

This digest was compiled to provide general information to the public as well as to Federal, State, and local officials. It contains excerpts from the individual State-Federal water quality standards establishing pollutant specific criteria for navigable surface waters. The water quality standards program is implemented by the U.S. Environmental Protection Agency where responsibility for providing water quality recommendations, approving State-adopted standards for navigable waters, evaluating adherence to the standards, and overseeing enforcement of standards compliance, has been mandated by Congress.

The standards program, a nationwide strategy for surface water quality management, contains two major elements: the use (recreation, drinking water, fish and wildlife propagation, industrial, or agricultural) to be made of the navigable water; and criteria to protect these uses.

Water quality criteria (numerical or narrative specifications) for physical, chemical, temperature, and biological constituents are stated in the July 1976 U.S. Environmental Protection Agency publication Quality Criteria for Water (QCW), order # 055-001-01049-4, price $3.50, available from the Government Printing Office, Washington, D.C. The 1976 QCW, commonly referred to as the "Red Book," is the most current compilation of scientific information used by the Agency as a basis for assessing water quality. This publication is subject to periodic updating and revisions in light of new scientific and technical information.

Fecal coliform bacterial criteria, which are the subject of this digest, are set to protect human health from diseases associated with using contaminated water. The risk of waterborne infectious diseases to human health is usually assessed by quantifying the concentration of some indicator microorganism that indicates the presence of fecal material in the water. Waterborne disease is then defined within the bounds of a concentration of indicator above which the health risk is unacceptably high. Bacteria of the fecal coliform group are considered to be the primary indicators of fecal contamination since they are usually associated in high numbers with the gastrointestinal track and feces of warm blooded animals.

Though a scientific and direct relationship between the water quality criteria for fecal coliform bacteria and microbial disease transferred by direct (i.e., swimming, drinking or shellfish consumption) or indirect (i.e., fishing, cattle watering) is lacking, the epidemiological evidence, though inadequate in many respects, suggests that some relationship exists. The most supportive information for this relationship is the continued reporting of gastrointestinal diseases in recreational shellfishing areas when bacterial concentrations are more than the fecal coliform bacteria

criteria given in the 1976 QCW. Therefore, fecal coliform bacteria are used as an indicator of the possible presence of pathogens in water and the risk of diseases. The criteria for this parameter as recommended by the 1976 QCW are:

Bathing Waters

Based on a minimum of five samples taken over a 30-day period, the fecal coliform bacterial level should not exceed a log mean of 200 per 100 ml, nor should more than 10 percent of the total samples taken during any 30-day period exceed 400 per 100 ml.

Shellfish Harvesting Waters

The median fecal coliform bacterial concentration should not exceed 14 MPN per 100 ml with not more than 10 percent of samples exceeding 43 MPN per 100 ml for the taking of shellfish.

Since water quality standards are revised from time to time, following procedures set forth in the Clean Water Act, individual entries in this digest may be superseded. This digest will be updated periodically. Because this publication is intended for use only as a general information reference, the reader needs to refer to the current approved water quality standards to obtain the latest information for special purposes and applications. These can be obtained from the State water pollution control agencies or the EPA Regional Offices.

Individual State-adopted criteria follow:

KEY

PWS	Public Water Supply
Rec.	Recreation
F&WL	Fish and Wildlife
Ind.	Industrial
Agric.	Agricultural
Mg/l	Milligrams per Liter
SAR	Sodium Absorption Ratio

(For explanation of use classifications, see EPA publication, General Stream Use Designations.)

BACTERIA

Alabama	PWS: 2,000/100 ml, nor exceed a maximum of 4,000/100 ml in any sample. Primary contact recreation: 100/100 geometric mean fecal coliforms in coastal waters. 200/100 fecal coliforms in fresh water. Where the geometric mean exceeds these levels, bacterial quality is acceptable only if a second detailed sanitary survey and evaluation discloses no significant public health risk. F&WL: Geometric mean fecal coliforms 1,000/100; no sample to exceed 2,000/100. Shellfish: National Shellfish Sanitation Program Manual of Operations, Sanitation of Shellfish Growing Areas limits incorporated by reference.
Alaska	(PWS without treatment): Less than 20/100 fecal coliform on 5 samples in 30 days or 40/100 for 10% of samples. Groundwater less than 1/100 (membrane filter) 3 f.c./100 by MPN. Class B (PWS with treatment): Monthly average less than 2,000/100 total coliform; not more than 20% of samples should exceed this number. Class C (Primary contact rec.): Monthly average less than 20/100 fecal coliform, with 10% of samples not to exceed 40 f.c./100. Class D (F&WL): NA Class E (Shellfish): NA Class F (Agricultural): Average less than 200/100 with 10% of samples not to exceed 400/100. Class G (Industrial): 200/100 with 10% 400 f.c./100 (5 samples).
American Samoa	In all waters, the number of fecal coliform bacteria shall not exceed an arithmetic mean of 100 per 100 millileters nor exceed 200/100 milliliters in more than 10% of samples during any 30-day period. In areas where shellfish are collected, coliform concentration shall comply with U.S. Public Health Service Shellfish Standards, in its latest revision.
Arizona	A (Domestic & Industrial & Agricultural): All waters except primary contact recreation, geometric mean 1,000/100 fecal coliforms, nor more than 10% of samples exceed 2,000/100.

Arizona (Cont'd) B (Primary contact recreation): Geometric mean 200/100 fecal coliforms, nor more than 10% of samples exceed 400/100.

Arkansas 1) Class AA and A Waters - Based on a minimum of not less than 5 samples taken over not more than a 30-day period, the fecal coliform content shall not exceed a log mean of 200/100 ml nor shall more than 10% of total samples during any 30-day period exceed 400/100 ml.

2) Class B Waters - The fecal coliform content shall not exceed a log mean of 1,000/100 ml, nor equal or exceed 2,000/100 ml in more than 10 percent of the samples taken in any 30-day period.

In all streams, for purposes of routine monitoring and evaluation, fewer numbers of samples collected over longer periods may be used. When such routine monitoring indicates a possible problem area, a sampling program following the requirements given above for Classes AA and A waters will be undertaken.

California

(1A) Klamath River Basin
(1B) North Coastal Basin

The bacteriological quality of waters of the north coastal region shall not be degraded beyond natural background levels. In no case shall coliform concentrations in waters of the north coastal region exceed the following:

In waters designated for contact recreation (REC 1), the median fecal coliform concentration based on a minimum of not less than 5 samples for any 30-day period shall not exceed 50/100 ml, nor shall more than 10% of total samples during any 30-day period exceed 400/100 ml.

At all areas where shellfish may be harvested for human consumption (SHELL), the median total coliform concentration throughout the water column for any 30-day period shall not exceed 70/100 ml nor shall more than 10% of the samples collected during any 30-day period exceed 230/100 ml for a 5-tube decimal dilution test or 330/100 ml when a 3-tube decimal dilution test is uses.

(2) Basin

In tidal waters designated for contact recreation (REC-1), the total coliform concentration, based on a minimum of not less than 5 consecutive samples, shall not exceed a median value of 240/100 ml, nor shall any sample exceed a total coliform concentration of 10,000/100 ml. In addition, the fecal coliform concentration, based on a minimum of 5 consecutive samples, shall not exceed a median value of 50/100 ml, nor shall any sample exceed a maximum fecal coliform concentration of 400/100 ml.

At all areas where shellfish may be harvested for human consumption (SHELL), the median total coliform concentration throughout the water column for any 30-day period shall not exceed 70/100 ml nor shall more than 10% of the samples collected during any 30-day period exceed 230/100 ml when a 3-tube decimal dilution test is used.

In nontidal waters designated for contact recreation (REC 1), the fecal coliform concentration based on a minimum of not less than 5 samples for any 30-day period shall not exceed a log mean of 200/100 ml, nor shall more than 10% of samples during any 30-day period exceed 400/100 ml.

In nontidal waters designated for noncontact recreation (REC-2) and not designated for contact recreation (REC-1), the average fecal coliform concentration for any 30-day period shall not exceed 2,000/100 ml nor shall more than 10% of samples collected during any 30-day period exceed 4,000/100 ml.

In nontidal waters used for domestic drinking water supply (MUN), the arithmetic average of at least 5 samples collected over a 30-day interval shall not exceed a total coliform concentration of 100 per 100 ml or a fecal coliform of 20 per 100 ml.

(3) Central Coastal Basin
Objectives for inland surface waters, enclosed bays and estuaries.

In waters designated for contact recreation (REC-1) the fecal coliform concentration, based on a minimum of not less than 5 samples for any 30-day period, shall not exceed a log mean of 200/100 ml, nor shall more than 10% of total samples during any 30-day period exceed 400/100 ml.

In waters designated for noncontact recreation (REC-2) and not designated for contact recreation (REC-1), the fecal coliform concentrations based on a minimum of not less than 5 samples for any 30-day period shall not exceed a kg mean of 2,000/100 ml, nor shall more than 10% of samples collected during any 30-day period exceed 4,000/100 ml.

At all areas where shellfish may be harvested for human consumption (SHELL), the median total coliform concentration throughout the water column for any 30-day period shall not exceed 70/100 ml, nor shall more than 10% of the samples collected during any 30-day period exceed 230/100 ml for a 5-tube decimal dilution test or 330/100 ml when a 3-tube decimal dilution test is used.

(4A) Santa Clara River Basin (Same as 3)

(4B) Los Angeles River Basin
Objectives for inland surface waters, enclosed bays and estuaries.

In waters designated for contact recreation (REC-1), the fecal coliform concentration based on a minimum of not less than 5 samples for any 30-day period, shall not exceed a log mean of 200/100 ml, nor shall more than 10% of total samples during any 30-day period exceed 400/100 ml.

In waters designated for noncontact recreation (REC-2) and not designated for contact recreation (REC-1) the average fecal coliform concentration for any 30-day period shall not exceed 2,000/100 ml nor shall more than 10% of samples collected during any 30-day period exceed 4,000/100 ml.

At all areas where shellfish may be harvested for human consumption (SHELL), the median total coliform concentration throughout the water column for any 30-day period shall not exceed 70/100 ml nor shall more than 10% of the

samples obtained during any 30-day period exceed 230/100 ml for a 5-tube decimal dilution test or 330/100 ml when a 3-tube decimal dilution test is used.

Where whole fish handling occurs (Fish Harbor in Los Angeles Inner Harbor) the maximum number of E. coli organisms shall be less than 7 per ml. Not more than 5 percent of the samples shall exceed 7 E. coli per ml.

(5A,B,C) Sacramento-San Joaquin Delta

This includes water quality objectives that apply to all inland surface waters (excluding the Delta) of the basins, and objectives that apply only to specific surface water bodies.

In waters designated for contact recreation (REC-1), the fecal coliform concentration based on a minimum of not less than 5 samples for any 30-day period shall not exceed a geometric mean of 200/100 ml, nor shall more than 10% of the total number of samples taken during any 30-day period exceed 400/100 ml.

The following objective applies to the water body specified:

Folsom Lake

The fecal coliform concentration based on a minimum of not less than 5 samples for any 30-day period shall not exceed a geometric mean of 100/100 ml, nor shall more than 10% of the total number of samples taken during any 30-day period exceed 200/300 ml. This presents specific numeric objectives which apply to the waters of the Sacramento-San Joaquin Delta. All waters lying within the legal boundaries of the Delta are covered by these objectives unless otherwise specified.

(5D) Tulare Lake Basin

In waters designated for contact recreation (REC-1), the fecal coliform concentration based on a minimum of not less than 5 samples for any 30-day period, shall not exceed a geometric mean of 200/100 ml, nor shall more than 10% of total samples during any 30-day period exceed 400/100 ml.

(Same as 1A - REC-1)

(6A) North Lahontan Basin

Waters shall not contain concentrations of coliform organisms attributable to human wastes. Also in waters designated for contact recreation (REC-1), the fecal coliform concentration based on a minimum of not less than 5 samples for any 30-day period, shall not exceed a log mean of 200/100 ml, nor shall more than 10% of total samples during any 30-day period exceed 400/100 ml, with the following exceptions:

Eagle Lake
Susan River
Lake Tahoe
Truckee River
East Fork Carson River
West Fork Carson River
East Walker River

West Walker River
Lake Topaz
Bryant Creek

The fecal coliform concentration for these waters and their tributaries, based on a minimum of not less than 5 samples for any 30-day period, shall not exceed a log mean of 20/100 ml, nor shall more than 10% of total samples during any 30-day period exceed 40/100 ml.

In waters designated for noncontact recreation (REC-2) and not designated for contact recreation (REC-1), the average fecal coliform concentration for any 30-day period shall not exceed 2,000/100 ml nor shall more than 10% of samples collected during any 30-day period exceed 4,000/100 ml.

(6B) South Lahontan Basin

Waters shall not contain concentrations of coliform organisms attributable to human wastes. Also, in waters designated for contact recreation (REC-1), the fecal coliform concentration based on a minimum of not less than 5 samples for any 30-day period shall not exceed a log mean of 200/100 ml, nor shall more than 10% of total samples during any 30-day period exceed 400/100 ml.

In waters designated for noncontact recreation (REC-2) and not designated for contact recreation (REC-1), the average fecal coliform concentration for any 30-day period shall not exceed 2,000/100 ml nor shall more than 10% of samples collected during any 30-day period exceed 4,000/100 ml.

(7A) West Colorado River Basin

In waters designated for contact recreation (REC-1), the fecal coliform concentration based on a minimum of not less than 5 samples for any 30-day period shall not exceed a log mean of 200/100 ml, nor shall more than 10% of total samples during any 30-day period exceed 400/100 ml. These bacteriological values are to be used as maximum allowables for the purpose of upgrading the bacteriological quality of those REC 1 waters whose fecal coliform levels are generally in excess of the above as of the effective date of this plan. Existing fecal coliform levels shall be maintained or shall be lowered where feasible in those REC 1 waters whose existing fecal coliform levels are generally below the listed levels as of the effective date of this plan.

In waters designated for noncontact recreation (REC-2) and not designated for contact recreation (REC-1), the average fecal coliform concentration for any 30-day period shall not exceed 2,000/100 ml nor shall more than 10% of samples collected during any 30-day period exceed 4,000/100 ml.

(7B) East Colorado River Basin

In waters designated for contact recreation (REC-1), the fecal coliform concentrations based on a minimum of not less than 5 samples for any 30-day period shall not exceed a log mean of 200/100 ml, nor shall more than 10% of total samples during any 30-day period exceed 400/100 ml. These bacteriological values are to be used as maximum allowables for the purpose of upgrading the bacteriological quality of those REC-1 waters whose fecal coliform levels are generally in excess of the above as of the effective date of this plan. Existing fecal coliform levels shall be maintained or shall be lowered where feasible, in those REC-1 waters whose existing fecal coliform levels are generally below the listed levels as of the effective date of this plan.

In waters designated for noncontact recreation (REC-2) and not designated for contact recreation (REC-1), the average fecal coliform concentration for any 30-day period shall not exceed 2,000/100 ml nor shall more than 10% of samples collected during any 30-day period exceed 4,000/100 ml.

(8) Santa Ana River Basin

The following water quality objectives apply to all inland surface waters, enclosed bays, and estuaries of the Basin.

1. Bacteriological Characteristics

a. At all areas where shellfish may be harvested for human consumption the following bacteriological objectives shall be maintained throughout the water column: (includes Sunset Bay Tidal Flat areas; Bolsa Bay; Newport Bay, Upper and Lower; and San Gabriel River Tidal Prism between Marina Drive to above Coyote Creek):

The median total coliform concentration shall not exceed 70 per 100 ml, and not more than 10% of the samples shall exceed 230 per ml for a 5-tube decimal dilution test or 330 per 100 ml, where the 3-tube decimal dilution test is used.

b. Within bay and tidal prism waters in water-contact sports areas (includes Sunset Bay; Huntington Harbor: Bolsa Bay; Newport Bay, Upper and Lower; and Tidal Prisms: Santa Ana River; Newport Shores Marina, South of Highland Street; and San Gabriel River, between mouth and Marine Drive), the following bacteriological water quality objectives shall be maintained through the water column:

(1) Samples of water from each sampling station shall have a concentration of coliform organisms less than 1,000 per 100 ml (10 per ml), provided that not more than 20% of the samples at any sampling station in any 30-day period, may exceed 1,000 per 100 ml (10 per ml), and provided further that no single sample when verified by a repeat sample taken within 48 hours shall exceed 10,000 per 100 ml (100 per ml); and

(2) Fecal coliform concentrations based on a minimum of not less than 5 samples for any 30-day period shall not exceed a log mean of 200 per 100 ml nor shall the fecal coliform concentration of more than 10% of the total samples during any 30-day period exceed 400 per 100 ml (as determined by multiple tube fermentation procedure).

c. Inland Surface Waters

(1) For all waters which are a direct source for municipal or domestic supply the concentration of coliform organisms shall be less than 100 per 100 ml.

(2) For all waters designated for beneficial use REC-1 (Water Contact Recreation) the recreation of fecal coliform organisms, based on a minimum

of not less than five samples for any 30-day period, shall not exceed a log mean of 200/100 ml nor shall more than 10% of the total samples during any 30-day period exceed 400/100 ml.

(3) For all waters designated for beneficial use REC-2 (Non Body Contact Recreation) the average fecal coliform concentration for any 30-day period shall not exceed 2,000/100 ml nor shall more than 10% of samples collected during any 30-day period exceed 4,000/100 ml.

(9) San Diego Basin

In waters designated for contact recreation (REC-1), the fecal coliform concentration based on a minimum of not less than 5 samples for any 30-day period shall not exceed a log mean of 200/100 ml, nor shall more than 10% of total samples during any 30-day perod exceed 400/100 ml.

In waters designated for noncontact recreation (REC-2) and not designated for contact recreation (REC-1), the average fecal coliform concentration for any 30-day period shall not exceed 2,000/100 ml nor shall more than 10% of samples collected during any 30-day period exceed 4,000/100 ml.

At all areas where shellfish may be harvested for human consumption (SHELL), the median total coliform concentration throughout the water column for any 30-day period shall not exceed 70/100 ml nor shall more than 10% of the samples collected during any 30-day period exceed 230/100 ml for a 5-tube decimal dilution test or 330/100 ml when a 3-tube decimal dilution test is used.

In bays and estuaries, the most probable number of coliform organisms in the upper 60 feet of the water column shall be less than 1,000 per 100 ml (10 per ml), provided that not more than 20% of the samples at any sampling station, in any 30-day period may exceed 1,000 per 100 ml (10 per ml), and provided further that no single sample when verified by a repeat sample taken within 48 hours shall exceed 10,000 per 100 (100 per ml).

In San Diego Bay where bay waters are used for whole fish handling, the density of E. coli shall not exceed 7 per ml in more than 20% of any 20 consecutive samples of bay water.

Ocean Plan:

1. Within a zone bounded by the shoreline and a distance of 1,000 feet from the shoreline or the 30-foot depth contour, whichever is further from the shoreline, and in areas outside this zone used for body-contact sports, the following bacteriological objectives shall be maintained throughout the water column:

(a) Samples of water from each sampling station shall have a concentration of coliform organisms less than 1,000 per 100 ml (10 per ml), provided that not more than 20% of the samples at any sampling station in any 30-day period may exceed 1,000 per 100 ml (10 per ml), and provided further that no single sample when verified by a repeat sample taken within 48 hours shall exceed 10,000 per 100 ml (100 per ml).

Colorado	Class A (PWS): Log mean 1,000/100 total coliforms, nor exceed 2,000/100 in more than 10% of samples during month. Class B.1 (Cold water fishery): Same as A Class B.2 (Warm water fishery): Same as A Class B.3 (Body contact sports): Monthly average 1,000/100 total coliform, nor exceed this in more than 20% of samples, nor exceed 2,400/100 in any sample. Also, 100/100 fecal coliforms and 20/100 fecal streptococcus (both as average of 5 samples within month).
Connecticut	Classes A and AA (PWS): Median 100/100 total coliform nor more than 500/100 in more than 10% of samples. Class B (Bathing): Median 1000/100 total coliforms, nor exceed 2,400/100 in more than 20% of samples. Class C (F&WL, secondary contact recreation): 30-day average 5,000/100 total coliform, nor exceed this in more than 20% of samples. Class SA (shell): Not to exceed median MPN of 70/100 total coliforms, nor exceed in more than 10% of samples MPN of 230 for 5-tube decimal dilution or 330 for 3-tube decimal dilution. Class SB (Restr. Shell., Rec.): Not to exceed median of 700/100; not more than 2,300 in more than 10% of samples. Class SC (F,WL, Shell Habitat): 30-day average 5,000/100 total coliform nor exceed this in more than 20% of samples.
Delaware	9A - General criteria for all non-tidal portions of stream basins (segments). Fecal Coliform (except Naaman's Creek Segment* see fecal coliform criteria for Delaware River above RM 595. See 9D) — The fecal coliform levels shall not exceed a log mean of 200/100 ml. Samples shall be taken at such frequency and location as to permit valid interpretations. 9C - Specific criteria for all tidal portions of basins except Delaware River and Chesapeake and Delaware Canal, but including Atlantic Ocean and Delaware Bay below RM 48.2 in addition to general criteria in 9A. Any repeated indicator/criteria found here supersedes that of 9A. Fecal coliform (for tidal portions of Christina and Brandywine, see fecal coliform criteria for Delaware River above RM 59.5 (See 9D) — The fecal coliform levels shall not exceed a log mean of 200/100 ml such frequency and location as to permit valid interpretation. Total Coliform (for shellfish waters) — The following recommended standards of the State Board of Health will govern. The coliform median MPN of the water shall not exceed 70 per 100 ml, and not have more than 10% of the samples ordinarily exceed an MPN of

Delaware (cont'd)	230 per 100 ml for a 5-tube decimal dilution test (or 330 per 100 ml where the 3-tube decimal test is used) in those portions of the area most probably exposed to fecal contamination during the most favorable hydrographic and pollution conditions in designated shellfish areas. Samples shall be taken at such frequency and location as to permit valid interpretation.

9D - Specific criteria for Delaware River (from Pa.-Del. line, RM 78.8 to Liston Point (RM 48.2) in addition to the general criteria of 9A. Repeated indicator/criteria here supersede those of 9A.

Fecal Coliform (above RM 59.5)	The fecal coliform shall not exceed a log mean of 770/100 ml. Samples shall be taken at such frequency and location as to permit valid interpretation.
Fecal Coliform (below RM 59.5)	The fecal coliform levels shall not exceed a log mean of 200/100 ml. Samples shall be taken at such frequency and location as to permit valid interpretation.

District of Columbia	Criteria are assigned to specific waters. Potomac River, Md. to Key Bridge--Primary contact recreation as a future anticipated use (1975): Fecal coliform not to exceed 240/100 in 90% of samples. Potomac River, Key Bridge to D.C.-Prince George's County Line--Secondary contact recreation: Fecal coliforms not to exceed a geometric mean of 1,000/100 nor equal or exceed 2,000/100 in more than 10% of samples. Rock Creek (wading in upper reaches): Fecal coliform not to exceed 200/100; not applicable during or immediately following rainfall. Anacostia River and Oxon Run are 1,000/100 ml.
Florida	(PWS): Monthly average 1,000/100 total fecal coliforms: nor exceed this number in more than 20% of the samples per month; nor exceed 2,400/100 on any day. Fecal coliform shall not exceed 200/100 ml (log mean), nor shall 10% exceed 400/100 ml. (Shellfish): Median coliform not exceed 70/100, not more than 10% of samples exceed 230/100 in areas most probably exposed to fecal contamination during most unfavorable hydrographic and pollution conditions. Fecal - 14/100 ml; 10% not exceeding 43/100 ml.

Florida (cont'd)	(Body contact recreation/Fish and Wildlife): Monthly average 1,000/100 total coliform; nor exceed this number in more than 20% of samples; nor exceed 2,400/100 ml on any day. Fecal - 200/100 ml; 10% 400/100 ml; 800/100 ml any one day.
Guam	Concentrations of fecal coliform at any point shall not be increased from natural conditions at any time. Fecal coliform bacteria content shall not exceed an arithmetic mean of 200 per 100 ml during any 30-day period nor shall any sample exceed 400 per 100 ml at any time. The median coliform bacteria content shall not exceed 70 per 100 ml during any 30-day period nor shall any sample exceed 230 per 100 ml at any time. Where shellfish are collected for human consumption, the microbiological standard for A or AA waters shall apply. To determine compliance with the above microbiological requirements where a "30-day period" is specified, a minimum of ten samples shall be collected at aproximately equal intervals.
Georgia	Class (1) (PWS) (a) (Requiring disinfection only): Mean 50/100 fecal coliforms; not exceed 200/100 in more than 5% of samples during 90 days. (b) (Requiring treatment): Mean 1,000/100 fecal coliforms on at least 4 samples within 30 days; not exceed 4,000/100. Class (2) (Recreation) (a) if naturally over 200/100 ml ave. may be 300/100 ml (lakes); ave. of 500/100 ml (rivers). (b) Coastal Waters - 100/100 ml (c) Other - 200/100 ml. Class (3) (F & WL): Same as (1)(b). Shellfish: Consistent with National Shellfish Sanitation Program. Urban Streams: 2,000/100 ml ave.; not to exceed 5,000/100 ml. Class (4) (Agriculture): Mean 5,000/100 fecal coliforms; based on 4 samples - 30 day period. Class (5) (Ind.): No coliform criteria. Class (6) (Nav.): Same as (4).

A (nearly pristine): Median 70/100 total coliforms; nor exceed 230/100 at any time.

Class A, 1 and 2 (all recreation; aesthetics): Total coliform median 1,000/100, nor more than 10% of samples exceed 2,400/100. Fecal coliforms: Arithmetic average 200/100 during 30 days, nor more than 10% exceed 400/100. Drinking and food processing following simple chlorination, fecal coliform arithmetic mean 200/100.

Class B (small boat harbors-commercial, bait fishing): Fecal coliform arithmetic average 400/100; nor more than 10% exceed 1,000/100.

Idaho

Bacteria criteria are adopted for individual waters.
Most rivers: Average 1,000/100 fecal coliform; 20% of samples not to exceed 2,400/100.
Lower Snake, Palouse, Spokane and Moyie Rivers: Average 240/100 fecal coliforms; Pend Oreille River, Pend Oreille Lake, Priest Lake and Coeur D'Alene Lake: Average 240/100 along shore line of lakes, 50/100 in main body of lake or stream.

Illinois

General Standards Based on a minimum of 5 samples taken over not more than a 30-day period, fecal coliforms (STORET Number 31616) shall not exceed a geometric mean of 200 per 100 ml, nor shall more than 10% of the samples during any 30 day period exceed 400 per 100 ml.

Lake Michigan Based on minimum of 5 samples taken over not more than a 30 day period, fecal coliforms (STORET Number 31616) shall not exceed a geometric mean of 20 per 100 ml.

Secondary Contact and Indigenous Aquatic Life Based on a minimum of 5 samples taken over not more than a 30-day period, fecal coliforms (STORET Number 31616) shall not exceed a geometric mean of 1,000 per 100 ml, nor shall more than 10% of the samples during any 30-day period exceed 2,000 per 100 ml.

Indiana

SPC 1R-4, General Standards

(Bacterial Quality for Whole Body Contact)

Criteria for maintaining whole body contact recreation at any point in the waters outside of the mixing zone is that the fecal coliform bacteria content (either MPN or MF count) shall not exceed 200 per 100 ml as a geometric mean based on not less than 5 samples per month; nor exceed 400 per 100 ml in more than 1 sample during the month. The months of April through October, inclusive, are designated as the whole body contact recreational season. During the remainder of the year, Section 6(f) will apply.

(Bacterial Quality for Partial Body Contact)

Criteria for maintaining partial body contact recreation at any point in the waters outside of the mixing zone is that

Indiana (cont'd)

the fecal coliform bacteria content (either MPN or MF count) shall not exceed 1,000 per 100 ml as a geometric mean based on not less than 5 samples per month; nor exceed 2,000 per 100 ml in more than 1 sample.

(Water Quality for Potable Supply)

Following standards are established to protect the water quality at the point at which water is withdrawn for treatment and distribution as a potable supply:

(Bacteria) The coliform bacteria group shall not exceed 5,000 per 100 ml as a monthly average value (either MPN or MF count); nor exceed this number in more than 20% of the samples examined during any month; nor exceed 20,000 per 100 ml in more than 5% of such samples.

SPC 4R-2, Lake Michigan and Contiguous Harbor Areas

(Fecal Coliform Bacteria) The fecal coliform content for whole body contact recreation shall not exceed 200/100 ml as a monthly geometric mean based on not less than 5 samples per month; nor exceed 400/100 ml in more than 10% of all samples taken during a month. (MPN or MF count/100 ml.) The fecal coliform content in the open water of Lake Michigan shall not exceed a geometric mean of 20 per 100 ml.

SPC 7R-3, Grand Calumet River and Indiana Harbor Ship Canal

(Fecal Coliform Bacteria) The fecal coliform bacteria content (either MPN or MF count) shall not exceed a geometric mean of 1,000 per 100 ml, nor exceed 2,000 per 100 ml in more than 10% of the samples, except during periods of storm water runoff.

SPC 10R-2, Wolf Lake

(Fecal Coliform Bacteria) The fecal coliform content (either MPN or MF count) in Wolf Lake proper and Wolf Lake Channel shall not exceed 200 per 100 ml as a geometric mean based on not less than 5 samples; nor exceed 400 per 100 ml in more than 10% of the samples.

SPC 12R, Salmonid Fishes

<u>Rearing or Imprinting Areas</u>

1. Trail Creek <u>and</u> <u>tributaries</u> upstream of U.S. Highway 35.

2. Little Calumet River and tributaries upstream (easterly) of the Wagner Road Bridge. The Wagner Road Bridge is located downstream of Chesterton at the southeast corner of the southwest quarter, Section 26, T 37 N, R 6 W, Porter County, Indiana.

Indiana(Cont'd) 3. Kintzele Ditch (Black Ditch) from Beverly Drive downstream to Lake Michigan.

4. Salt Creek above its confluence with the Little Calumet River.

Fecal Coliform Bacteria: The fecal coliform bacteria content (either MPN or MF count) shall not exceed a geometric mean of 200 per 100 ml, nor exceed 400 per 100 ml in more than 10% of the samples.

Iowa

Full body contact: From April 1 - October 31, 200/100 ml fecal coliform except when water is materially affected by surface run-off. No discharge potentially containing pathogens may increase the count of 200/100 ml f.c.

Partial body contact: April 1 - October 31: 2,000/100 ml fecal coliform.

Kansas

Recreation including fishing: 2,000/100 fecal coliform per sample.

Body contact recreation: Monthly log mean fecal coliforms 200/100; no more than 10% of samples per month exceed 400/100 fecal coliforms.

Kentucky

PWS: Monthly arithmetical average 5,000/100 total coliforms;not exceed this number in more than 20% of the samples; nor exceed 20,000/100 in more than 5% of the samples.

Recreation including body contact: Average 1,000/100 total coliforms; not exceed this number in 20% of the samples; nor exceed 2,400/100 on any day. If the level of total is exceeded, then fecal coliforms standard to be used: During May-Oct., 200/100 fecal coliform monthly geometric mean, nor exceed 400/100 in more than 10% of the samples, and during Nov.-Apr. 1,000/100 fecal coliforms monthly geometric mean nor exceed 2,000/100 in more than 10% of the samples.

Aquatic life for Federally promulgated streams: 2,000/100 ml nor exceed a maximum of 4,000/100 ml.

Louisiana

Standard #1

PRIMARY CONTACT RECREATION - Based on a minimum of not less than 5 samples taken over not more than a 30-day period, the fecal coliform content shall not exceed a log mean of 200/100 ml nor shall more than 10% of the total samples during any 30-day period exceed 400/100 ml.

Louisiana (cont'd)	Standard #2	SECONDARY CONTACT RECREATION - Based on a minimum of not less than 5 samples taken over not more than a 30-day period, the fecal coliform content shall not exceed a log mean of 1,000/100 ml nor shall more than 10% of the total samples during any 30-day period equal or exceed 2,000/100 ml.
	Standard #3	PUBLIC WATER SUPPLY - The monthly arithmetic average of total coliform MPN (most probable number) shall not exceed 10,000/100 ml nor shall the monthly arithmetic average of fecal coliforms exceed 2,000/100 ml.
	Standard #4	SHELLFISH PROPAGATION - The monthly total coliform median MPN (most probable number) shall not exceed 70 per 100 ml and not more than 10% of the samples ordinarily exceed an MPN of 230/100 ml.
Maine	Freshwater	
	Class A	(PWS after disinfection; water contact recreation) - 100/100 total coliform bacteria.
	Class GP-A	(PWS after disinfection; water contact recreation) - 20/100 fecal coliform bacteria.
	Class B-1	GP-B - (PWS after treatment; water contact recreation; fish and wildlife) - 60/100 fecal coliform bacteria.
	Class B-2	(PWS after treatment; water contact recreation; fish and wildlife) - 200/100 fecal coliform bacteria.
	Class C	(Fish and wildlife) - 1,000/100 fecal coliform bacteria.
	Class D	(Power; navigation) - Only in those amounts which Commission determines will not indicate a condition harmful to public health or impair assigned uses.
	Marine Water	
	Class SA	(Shellfish harvesting direct human consumption; water contact recreation; fish and wildlife) - Median total coliform 70/100 nor more than 10% of samples exceed 230/100. Median fecal coliform 14/100 nor more than 10% of samples exceed 43/100.

Maine (cont'd)	Class SB-1	(Uses same as SA) - Shellfish growing areas same as SA. Non-shellfish growing areas: median total coliform 240/100 nor more than 10% of samples exceed 500/100. Median fecal coliform 50/100 nor more than 10% exceed 150/100.
	Class SB-2	(Uses same as SA) - Shellfish growing areas same as SA. Non-shellfish growing areas: median total coliform 500/100 nor more than 10% of samples exceed 1,000/100. Median fecal coliform 100/100 nor more than 10% exceed 200/100.
	Class SC	(Shellfish harvesting for consumption after depuration; fish and wildlife) - Shellfish growing areas: median total coliform 700/100 nor more than 10% of samples exceed 2,300/100. Median fecal coliform 150/100 nor more than 10% of samples exceed 500/100. Non-shellfish growing areas: median total coliform 1,500/100 nor more than 10% of samples exceed 5000/100. Median fecal coliform 300/100 nor more than 10% exceed 1,000/100.
	Class SD	(Power; navigation; ind.) - Only in those amounts which Commission determines will not indicate a condition harmful to public health or impair assigned uses.
Maryland	Class A	Not greater than log mean of 200/100 ml (all waters except SHW).
	Class B	Not greater than MPN of 70/100 ml as a median; not greater than 10% highest MPN of 230/100 ml (SHW).
	Class C	(F & WL): Same as B (water contact recreation).
Massachusett	Class A	(PWS): Not exceed log mean 50/100 total coliform.
	Class B	(Water contact; PWS with treatment): Not exceed log mean 200/100 fecal coliforms, nor exceed 400/100 in more than 10% of samples.
	Class C	(recreational boating, F & WL): Not exceed log mean 1,000/100 fecal coliform, nor exceed 2,500/100 in more than 10% of samples.

Massachusetts (cont'd)

Class SA (body contact sports, shellfish): Median total coliforms MPN 70/100, not exceed 230/100 in more than 10% of samples during month.

Class SB (bathing, F & WL, restricted shellfish): Median total coliforms MPN 700/100, not exceed 1,000/100 in more than 20% of samples during month.

Class SC (recreational boating, F & WL): Shall not exceed log mean 1,000/100 fecal coliform, nor exceed 2,500/100 in more than 10% of samples.

Michigan

Fecal coliform.

(1) Waters of the State protected for total body contact recreation shall contain not more than 200 fecal coliforms per 100 milliliters; and all other waters of the State shall contain not more than 1,000 fecal coliforms per 100 milliliters. These concentrations may be exceeded if due to uncontrollable non-point sources.

(2) Compliance with the fecal coliform standards prescribed by subrule (1) shall be determined on the basis of the geometric average of any series of 5 or more consecutive samples taken over not more than a 30-day period.

Minnesota

1. Domestic Consumption

Class A Total coliform organisms	1 most probable number per 100 milliliters.
Class B Fecal coliform organisms	10 most probable number per 100 milliliters.
Class C Fecal coliform organisms	200 most probable number per 100 milliliters.
Class D Fecal coliform organisms	200 most probable number per 100 milliliters.

Minnesota (cont'd)

2. Fisheries and Recreation

Class A
Fecal coliform organisms - 200 most probable number per 100 milliliters as a monthly geometric mean based on not less than 5 samples per month, nor exceed 400 most probable number per 100 milliliters in more than 10% of all samples during the month.

Class B
Fecal coliform organisms - 200 most probable number per 100 milliliters as a monthly geometric mean based on not less than 5 samples per month, nor equal or exceed 2,000 most probable number per 100 milliliters in more than 10% of all samples during any month.

Class C
Fecal coliform organisms - 200 most probable number per 100 milliliters as a geometric mean or exceed 2,000 most probable number per 100 milliliters in more than 10% of all samples.

3. *Industrial Consumption*
Classes A, B, and C
Fecal coliform organisms - 200 most probable number per 100 milliliters.

4. Agriculture and Wildlife
Class A
Fecal coliform organisms - 200 most probable number per 100 milliliters.

Class B
Fecal coliform organisms - 200 most probable number per 100 milliliters.

5. Navigation and Waste Disposal
Fecal coliform organisms - 200 most probable number per 100 milliliters.

Mississippi	Class 1	PWS: Monthly average fecal coliforms not exceed 2,000/100, based on at least 5 samples a month, nor exceed 4,000/100 any 1 sample.
	Class 2	Shellfish: MPN shall not exceed 14/100 ml, nor more than 10% ordinarily exceed an MPN of 43/100 ml in areas most probably exposed to fecal contamination during most unfavorable hydrographic and pollutional conditions.
	Class 3	Recreation (include body contact): Monthly average fecal coliforms not exceed 200/100, nor exceed this in more than 20% of the samples, nor exceed 400/100 at any time.
	Class 4	Fish and wildlife: Fecal coliforms shall not exceed a geometric mean of 2,000/100 ml, nor shall 10% of the samples exceed 4,000/100 ml.
Missouri	Full body contact: Fecal coliform shall not exceed 200/100 ml geometric mean during recreational season (April 1 - October 31).	
Montana	Class A	(PWS after disinfection): Average total coliform less than 50/100.
	Class A	(PWS after disinfection & removal of natural impurities): Average total coliform less than 50/100 as result of domestic sewage.
	Class B	(PWS after treatment): Average total coliforms less than 1,000/100 where demonstrated to be result of domestic sewage; not more than 20% of samples to exceed this value.
		All other classifications: Same as B.
Nebraska	Class 1	Full body contact sport: Not exceed geometric mean 200/100 ml fecal coliform and not exceed 400/100 ml in more than 10% of samples.
	Class 2	Partial body contact: Not to exceed geometric mean of 1,000/100 ml and less than 10% will be greater than 2,000/100 ml fecal coliform.

Nevada Fecal Coliform (applies to various interstate waters) - The annual geometric mean shall not exceed 100 per 100 milliliters nor shall the number of fecal coliform in a single sample exceed 200 per 100 milliliters.

Fecal Coliform (applies to various interstate waters) - The annual geometric mean shall not exceed 200 per 100 milliliters nor shall the number of fecal coliform in a single sample exceed 400 per 100 milliliters.

Fecal Coliform - The more stringent of the following apply:

Applies to various Interstate waters	The fecal coliform concentration shall not exceed a geometric mean of 1,000 per 100 milliliters nor shall more than 20% of total samples exceed 2,400 per 100 milliliters. The annual geometric mean of fecal coliform concentration shall not exceed that characteristic of natural conditions by more than 200 per 100 milliliters nor shall the number of fecal coliform in a single sample exceed that characteristic of natural conditions by more than 400 per 100 milliliters.
Fecal Coliform Interstate Class A waters & Class B waters	The fecal coliform concentration, based on a minimum of 5 samples during any 30-day period shall not exceed a geometric mean of 200 per 100 milliliters, nor shall more than 10% of total samples during any 30-day period exceed 400 per 100 milliliters.
Fecal Coliform Intrastate Class C waters	The more stringent of the following apply: The fecal coliform concentration shall not exceed a geometric mean of 1,000 per 100 milliliters nor shall more than 20% of total samples exceed 2,400 per 100 milliliters. The annual geometric mean of fecal coliform concentration shall not exceed that characteristic of natural conditions by more than 200 per 100 milliliters nor shall the number of fecal coliform in a single sample exceed that characteristic of natural conditions by more than 400 per 100 milliliters.
Fecal Coliform Intrastate Class C waters	The fecal coliform concentration, based on a minimum of 5 samples during any 30-day period, shall not exceed a geometric mean of 200 per 100 milliliters, nor shall more than 10% of total samples during any 30-day period exceed 400 per 100 milliliters. This is applicable only to those waters used for primary contact recreation.

New Hampshire Class A (highest quality; PWS after disinfection): 50/100 total coliforms.

Class B (bathing, fish and wildlife): 240/100 total coliforms freshwater; 70/100 total coliform for shellfish- growing waters.

Class C (recreational boating, fish and wildlife): 1,000/100 total coliforms, nor shall exceed 2,500/100 total coliforms waters affected by combined sewer overflows.

New Jersey Class FW-1 - Natural conditions

FW-2,FW-3,TW-1 (primary contact recreation) - Monthly geometric mean fecal coliform 200/100 ml.

TW-1,CW-1,CW-2 (shellfishing) - National Shellfish Sanitation Program limits.

CW-1 (primary contact recreation) - Monthly geometric mean fecal coliform 50/100 ml.

TW-2 (secondary contact recreation) - Monthly geometric average fecal coliform 770/100 ml.

TW-3 (secondary contact recreation) - Monthly geometric average fecal coliform 1,500/100 ml.

CW-2 (secondary contact recreation) - Monthly geometric average fecal coliform 200/100 ml.

Class FW - Central Pine Barrens - Monthly geometric mean fecal coliform 200/100 ml, not more than 10% greater than 400/100 ml.

Class Lower Mullica and Wading Rivers - same as FW-Central Pine Barrens.

New Mexico Criteria are assigned by river basin. The criteria listed below are representative.

Pecos River (irrig., recreation, F & WL): Geometric average fecal coliform 200/100 or 100/100.

Canadian River (PWS, fishery): Arithmetic average fecal coliforms 2,000/100; where body contact recreation, same as Pecos River.

New York Class N - Natural conditions

AA - Monthly median total coliform 50/100 ml, not more than 20% greater than 240/100 ml.
A - Monthly median total coliform 5,000/100 ml, not more than 20% greater than 20,000/100 ml. Monthly geometric mean fecal coliform 200/100 ml.

B&SB - Monthly median TC 2,400/100 ml, not more than 20% greater than 5,000/100 ml. Monthly geometric mean fecal coliform 200/100 ml when disinfection required.

New York (cont'd)	C&SC - Monthly geometric mean TC 10,000/100 ml, FC 2,000/100 ml when disinfection required. D&SD - No standard. SA (shellfish) - Median MPN for TC 70/100 ml. A - Special - Monthly geometric mean total coliform 1,000/100 ml. Monthly geometric mean fecal coliform 200/100 ml. AA - Special - Natural conditions I - same as SC
North Carolina	Class A-I (PWS): Monthly average total coliforms 50/100. Class A-II(PWS after treatment): Monthly average total coliforms 5,000/100 nor exceed this in more than 20% of the samples, nor exceed 20,000/100 in more than 5% of the samples. Fecal coliforms not exceed monthly log mean of 1,000/100, nor exceed 2,000/100 in more than 20% of samples (not applicable during or immediately following rainfall). Class B (bathing): Monthly log mean fecal coliforms not exceed 200/100 nor exceed 400/100 in more than 20% of samples (not applicable during or immediately following rainfall). Applicable only during the months of May thru September. During other months the standard shall be the same as Class C. Class C (F & WL): Monthly log mean fecal coliforms not exceed 1,000/100, nor exceed 2,000/100 in more than 20% of samples (not applicable during or immediately following rainfall). In certain stream segments where uncontrollable non-point source pollution prevents the attainment of the standards, exceptions will be given on a case-by-case basis. SA (shell): Median total coliforms not exceed 70/100, nor more than 10% of samples exceed 230/100 (5-tube) or 330/100 (3-tube) in areas most probably exposed to fecal contamination during most unfavorable hydrographic and pollution conditions. SB (bathing): Same as B. SC (F & WL, boating): Same as C.
North Dakota	Criteria are assigned by river basin. The criteria listed below are representative. Red River of the North: Monthly arithmetic average total coliform 5,000/100, nor exceed this in more than 20% of samples, nor exceed 10,000/100 in more than 5% of samples. Average arithmetic monthly total coliforms not exceed 1,000/100 in Lake Ashtabula and Homme Dam Reservoirs. James River (PWS, ind., rec., F & WL): Average arithmetic monthly not exceed 1,000/100 total coliforms in the Jamestown Reservoir. Average arithmetic monthly not exceed 3,000/100 in the river nor exceed this number in more than 20% of samples, nor exceed 7,500/100 in more than 5% of samples.

North Dakota (cont'd)

Footnote 1, all areas: In general, waters with coliform count of 1,000/100 or less are considered relatively safe for swimming. Natural physical characteristics of the river banks and bed and natural water turbidities in the area must also be considered.

Ohio

BATHING WATERS

These are waters suitable for swimming where a lifeguard and/or bathhouse facilities are present, during the recreation season.

Fecal coliform - Geometric mean fecal coliform content (either MPN or MF), based on not less than 5 samples within a 30-day period shall not exceed 200 per 100 ml and shall not exceed 400 per 100 ml in more than 10% of the samples taken during any 30-day period.

PRIMARY CONTACT RECREATION

These are waters suitable for full body contact recreation, such as, but not limited to: swimming and scuba diving with minimal threat to public health as a result of water quality, during the recreation season.

Fecal coliform - Geometric mean fecal coliform content (either MPN or MF), based on not less than 5 samples within a 30-day period shall not exceed 1,000 per 100 ml and shall not exceed 2,000 per 100 ml in more than 10% of the samples taken during any 30-day period.

SECONDARY CONTACT RECREATION

These are waters suitable for partial body contact recreation, such as, but not limited to: canoeing and wading with minimal threat to public health as a result of water quality during the recreation season.

Fecal coliform - shall not exceed 5,000 per 100 ml (either MPN or MF) in more than 10% of the samples taken during any 30-day period.

Lake Erie, outside of the excepted areas

Fecal coliform - Geometric mean fecal coliform content (either MPN or MF), based on not less than 5 samples within a 30-day period shall not exceed 200 per 100 ml and shall not exceed 400 per 100 ml in more than 10% of the samples taken during any 30-day period.

Ohio (Cont'd) Lake Erie, within excepted areas - Same as primary contact recreation.

OHIO RIVER

Bacteria:

(1) Fecal coliform for primary recreation: Content (either MPN or MF count) shall not exceed 200/100 ml as a monthly geometric mean based on not less than 5 samples per month; nor exceed 400 per 100 ml in more than 10% of all samples taken during month; these limits are applicable to waters designated for recreational use during the recreation season.

(2) Fecal coliform for potable water supply: Fecal coliform content (either MPN or MF count) shall not exceed 2,000/100 ml as a monthly geometric mean based on not less than 5 samples per month.

MAHONING RIVER BASIN

The Mahoning River upstream of the Leavittsburg Dam and all tributaries except Little Squaw Creek downstream of Highway I-80; Hines Run downstream of Lowellville Road; Mosquito Creek downstream of Federal Street in Niles; the last 200 yards of Yellow Creek.

For Public Water Supply

Waters designated as a source of public water supply will be of such quality that Federal Drinking Water Standards for finished water can be met by conventional treatment which includes coagulation, filtration and disinfection.

The following criteria are applicable to stream waters used as a potable supply:

Bacteria: Coliform group not to exceed 5,000 per 100 ml as monthly average value (either MPN or MF count); nor exceed this number in more than 20% of the samples examined during any month; nor exceed 20,000 per 100 ml in more than 5% of such samples.

For Recreation

The following criterion is for evaluation of conditions for waters designated to be used for recreational purposes:

(i) Primary Contact - (Swimming and Waterskiing)

Ohio (con'd)

Bacteria: The fecal coliform content (either MPN or MF count) not to exceed 200 per 100 ml as a monthly geometric mean based on not less than 5 samples per month; nor exceed 400 per 100 ml in more than 10% of all samples taken during a month.

(ii) Secondary Contact - (Boating, Fishing and Wading)

Bacteria: The fecal coliform content (either MPN or MF count) not to exceed 1,000 per 100 ml as a monthly geometric mean based on not less than 5 samples per month; nor exceed 2,000 per 100 ml in more than 10% of all samples taken during a month.

MAHONING RIVER - LOWER MAIN STEM AND CERTAIN TRIBUTARIES

Reach No.		Mile Points from Mouth Beginning	Ending
1	Leavittsburg Dam to Main St. in Warren	46.08	38.08
2	Main St. in Warren to the Lowellville Dam	38.08	12.81
3	Lowellville Dam to the Ohio-Pa. State line	12.81	11.61

CERTAIN TRIBUTARIES TO WHICH THIS REGULATION APPLIES ARE:

(a) Mosquito Creek from Federal Street in Niles to its mouth.

(b) Little Squaw Creek from Highway I-80 to its mouth.

(c) Hines Run, from Lowellville Road to its mouth.

(d) Yellow Creek, the last 200 yards to its mouth.

For Public Water Supply

(i) Water classified as a source of public water supply will be of such quality that Federal Drinking Water Standards for finished water can be met: For classification PWS_0 by conventional treatment which includes coagulation, filtration, and disinfection;

(ii) For classification PWS_1 by one or a combination of the following practices in conjunction with conventional treatment;

Ohio (cont'd)

(a) selective withdrawal and control of raw water.

(b) lime-soda softening

(c) activated carbon

bacteria: coliform group not to exceed 2,000 (for PWS_0), 5,000 (for PWS_1) per 100 ml as a monthly geometric mean (either MPN or MF count); or exceed this number in more than 20% of the samples examined during any month; nor exceed 20,000 per 100 ml in more than 5% of such samples.

For Body Contact Recreation

Waters classified in the two subcategories of body contact recreation will be suitable for recreation in (Rpc) or on (Rsc) the waters, and will not threaten the public's health and safety in such uses.

The following criteria apply to the respective subcategories:

(a) Primary contact recreation - Rpc. (swimming and water skiing)

Bacteria: The fecal coliform content (either MPN or MF count) not to exceed 1,000 per 100 ml as a monthly geometric mean based on not less than 5 samples per month; nor exceed 2,000 per 100 ml in more than 10% of all samples taken during a month.

(b) Secondary contact recreation - Rsc. (boating and fishing)

Bacteria: The fecal coliform content (either MPN or MF count) not to exceed 2,000 per 100 ml as a monthly geometric mean based on not less than 5 samples per month; nor exceed 3,000 per 100 ml in more than 10% of all samples taken during a month.

Ohio (Cont'd) LOWER CUYAHOGA RIVER

(1) Geometric mean fecal coliform content (either MPN or MF count), based on not less than 5 samples within a 30-day period, shall not exceed 200 per 100 ml.

(2) Fecal coliform content (either MPN or MF count) shall not exceed 400 per/100 ml in more than 10% of the samples taken during any 30- day period.

That portion of the Lower Cuyahoga river from the Cleveland Southerly Sewage Treatment Plant to the mouth of the Cuyahoga River is hereby classified as appropriate for industrial water supply and secondary contact recreational uses.

Recreation Season is the period from 1 May to 15 October.

Oklahoma

In all waters designated as Emergency Public and Private Water Supplies, it is desirable that the monthly arithmetic mean of total coliform, as determined by multiple tube fermentation or membrane filter procedures, shall not exceed 10,000/100 ml, and that the monthly arithmetic mean of fecal coliform not exceed 2,000/100 mg.

In waters designated for Public and Private Water Supplies and Primary Body Contact Recreation, the bacteria of the fecal coliform group shall not exceed a monthly geometric mean of 200/100 ml, as determined by multiple tube fermentation or membrane or membrane filter procedures based on a minimum of not less than five (5) samples taken over not more than a thirty (30) day period. Further, in no more than 10% of the total samples during any thirty (30) day period shall the bacteria of the fecal coliform group exceed 400/100 ml.

Oregon

General Water Quality Standards: No discharge which will cause in any waters:. . . Bacterial pollution . . . deleterious to waters used for domestic purposes, livestock waters, irrigation, bathing, or shellfish propagation, or be otherwise injurious to public health. Special standards for Goose Lake, Klamath River, Multnomah Channel, Willamette River, Grande Ronde River, Walla Walla River and Snake River: Coliforms where associated with fecal sources, average not to exceed 1,000/100, with 20% of samples not to exceed 2,400/100.

Oregon (cont'd) Special standards for Columbia River: From eastern Oregon-Washington boundary to Hwy. 5 bridge between Vancouver and Portland: Average not to exceed 240/100 fecal coliform nor exceed this in more than 20% of samples. From bridge to mouth, same as special standard for Goose Lake, etc.

Special standards for marine and estuarine water: For shellfish, median not exceed 70/100. For others, same as upper Columbia.

Pennsylvania

Class f_1 - The fecal coliform density in 5 consecutive samples shall not exceed a geometric mean of 200 per 100 ml.

f_2 - (Coliforms/100 ml) - Not more than 5,000/100 ml as a monthly average value, nor more than this number in more than 20% of the samples collected during any month, nor more than 20,000/100 ml in more than 5% of the sample.

f_3 - (Coliforms/100 ml) - Not more than 5,000/100 ml as a monthly geometric mean.

f_4 - (Fecal coliforms/100 ml)-Maximum geometric mean of 770/100 ml; samples shall be taken at a frequency and location to permit valid interpretation.

Puerto Rico

Class SA (existing phenomena): Monthly geometric mean fecal coliform 70/100 ml, not more than 20% greater than 200/100 ml.

Class SB (shellfish): Median value total coliform 70/100 ml, not more than 20% greater than 230/100 ml (bathing): Monthly geometric mean fecal coliform 200/100 ml, not more than 20% greater than 400/100 ml.

Class SC (secondary contact recreation): Monthly geometric mean fecal coliform 2,000/100 ml, not more than 20% greater than 4,000/100 ml. Monthly geometric mean total coliform 10,000/100 ml.

Class SD (PWS): same as SC.

Rhode Island

Class A (uniformly excellent; all uses): Total coliforms not to exceed median 100/100, nor more than 10% of samples exceed 500/100.

Class B (primary contact recreation): Total coliforms not exceed median of 1,000/100 nor more than 2,400/100 in more than 20% of samples.

Rhode Island (cont'd)	Class C (secondary contact recreation): None in concentrations that would impair assigned uses.
	Class D (navigation, etc.): Same as C.
	Class SA (shell.): Total coliforms not to exceed median MPN of 70/100, nor more than 10% of samples exceed 230/100 (5-tube) or 330/100 (3-tube).
	Class SB (primary contact recreation; restricted shell. area): Total coliforms not to exceed median 700/100, nor more than 2,300 in more than 10% of the samples.
	Class SC (secondary contact recreation; fish and shellfish habitat): Same as C.
	Class SD (navigation, industry, etc.): Same as C.
	NOTE: Bacteria surveys of sea waters should include sampling during periods of most unfavorable hydrographic and pollution conditions.
South Carolina	Class AA (PWS with only disinfection and pH adjustment): Fecal coliforms not exceed 20/100 monthly arithmetic average.
	Class A (swimming): Fecal coliforms not exceed geometric mean 200/100, nor more than 10% of samples during 30 days exceed 400/100.
	Class B (PWS, fish survival, industry, agriculture, secondary contact recreation): Fecal coliforms not exceed geometric mean 1,000/100 ml nor exceed 2,000/100 in more than 20% of samples (not applicable during or following rainfall).
	Class SAA (outstanding, salt): median of 70/100 ml; nor shall more than 10% of 5 samples exceed a MPN of 230/100 ml; or current Dept. of Health and Env. Control & U.S. FDA standards.
	Class SA (shellfish): Same as SAA.
	Class SB (bathing): Same as A.
	Class SC (all uses except shellfish mkt. and bathing): Same as B.

South Dakota

Class 1 (PWS): Total coliforms not exceed MPN or MF (Millipore Filter) of 5,000/100 monthly average, nor exceed this in more than 20% of samples, nor exceed 20,000/100 in more than 5% of samples.

Class 2 (fish life propagation): No criteria.

Class 3(a) (immersion sports): Fecal coliform not exceed 200/100 monthly average, nor exceed this in more than 20% of samples, nor exceed 400/100 on any day during the recreation season.

Class 3(b) (limited contact recreation): Fecal coliforms 1,000/100 monthly average, nor exceed this in more than 20% of samples, nor exceed 2,000/100 on any day during the recreation season.

Class 4 (wildlife): No criteria.

Class 5 (irrigation--applicable during the irrigation season only, and only to waters used to irrigate root crops and recreation areas): Fecal coliforms not exceed 1,000/100 monthly average, nor exceed 2,000/100 in any sample.

Class 6 (commerce & ind.): No criteria.

Class 7 (intermittent stream): Total coliform not exceed 20,000/100 monthly average, nor exceed in more than 20% of samples in month; nor exceed 50,000/100 in any sample.

Tennessee

Class 1 (PWS): Fecal coliform not exceed 1,000/100 monthly average (geometric mean) based on at least 10 samples of a period not more than 30 days, samples being collected at intervals not less than 12 hours. Fecal coliform shall not exceed 5,000/100 in any individual sample.

Class 2 (Ind.): No criteria.

Class 3 (F & WL): Same as Class 1.

Class 4 (Rec.): Fecal coliform not exceed 200/100 as a geometric mean based on at least 10 samples of a period not more than 30 days, samples being collected at intervals not less than 12 hours. For water contact rec., fecal coliform not exceed 1,000/100 in any individual sample. Water areas near outfalls of domestic sewage treatment plants are not considered suitable for water contact recreation.

Texas

a. Contact recreation waters

Surface waters suitable for contact recreation shall not exceed a logarithmic mean (geometric mean) fecal coliform content from a representative sampling of not less than 5 samples collected over not more than 30 days, as determined by either multiple-tube fermentation or membrane filter techniques, of 200/100 ml, nor shall more than 10% of total samples during any 30-day period exceed 400/100 ml.

Simple compliance with bacteriological standards does not insure that waters are safe for primary contact recreation, such as swimming. Longstanding public health principles mandate that watershed sanitary surveys be conducted in order to adequately evaluate the sanitary hazards potentially present on any natural watercourse.

b. Noncontact recreation waters

Surface waters for general or noncontact recreation should, with specific and limited exceptions, be suitable for human use in recreation activities not involving significant risks of ingestion. These waters shall not exceed a logarithmic mean (geometric mean) fecal coliform content of 2,000/100 ml, nor equal or exceed 4,000/100 ml in more than 10% of the samples, except in specified mixing zones adjacent to outfalls.

c. Domestic raw water supply

It is the goal that the chemical quality of all surface waters used for domestic raw water supply conform to the U. S. Public Health Service, Drinking Water Standards, revised 1962 or latest revision. However, it must be realized that some surface waters are being used that cannot meet these standards. Since in these cases it is the only source available, these surface waters may be deemed suitable for use as a domestic raw water supply, where the chemical constituents do not pose a potential health hazard.

Texas (cont'd)

National primary drinking water regulations are to be established by the Environmental Protection Agency pursuant to the Safe Drinking Water Act. These regulations shall specify a maximum contaminant level or require the use of specific treatment techniques for contaminants. Domestic raw water supply quality should be consistent with the findings of EPA regarding maximum contaminants and treatment techniques.

It is desirable that the total coliform content should not exceed 100/100 ml and the fecal coliform content 20/100 ml; however, domestic water supplies should not be considered unacceptable if an adequate number of samples show monthly arithmetic averages for total coliform to be less than 10,000/100 ml and fecal coliform to be less than 2,000/100 ml.

The evaluation of raw water cannot be reduced to simply counting bacteria of any kind and the foregoing must be used with judgment and discretion and this paragraph is not intended to limit the responsibilities and authorities of responsible local governments or local health agencies.

Trust Territories

There shall be no discharge of sewage, industrial wastes, or other wastes into waters designated for public or domestic water supply. To the extent that such discharges are now occurring and such discharges reach surface waters, fecal coliforms shall not exceed an arithmetic mean of 20/100 ml in any 30-day period. Fresh ground waters designated for public or domestic water supply shall be protected and preserved so that they will meet PHS Drinking Water Standards.

The fecal coliform limit in primary contact waters shall not exceed a log mean of 200/100 ml nor exceed 400/100 ml in more than 10% of samples during any 30-day period.

In shellfish areas, coliform concentrations shall comply with Public Health Service Shellfish Standards in its latest revision (shellfish).

Fecal coliform limits shall not exceed 2000/100 ml at any time or at any place.

Utah

Class A (PWS without treatment; recreation): Bacterial standards as prescribed for drinking water by PHS Drinking Water Standards, 1962.

Class B (PWS after disinfection; recreation): Monthly arithmetic mean coliforms not exceed 50/100 ml; 20% of samples may exceed this if no more than 5% exceed 100/100.

Utah (cont'd)

Class C (PWS after treatment; recreation, excepting swimming unless natural purification action results in quality consistent with class "CR" standard and swimming is specifically approved by State board of health): Monthly arithmetic mean total coliforms not to exceed 5,000/100, except 20% of samples may exceed this if no more than 5% exceed 20,000/100, and monthly arithmetic mean coliforms shall not exceed 2,000/100.

Class CR (swimming): Monthly arithmetic mean coliforms not exceed 1,000/100; no more than 20% exceed this and no more than 5% exceed 4,000/100; and monthly arithmetic mean fecal coliforms exceed 200/100, provided no more than 10% exceed 400/100.

Class D (limited irrigation, not including lawns, rec. areas, dairy pastures, root crops or low growing crops for human consumption): Monthly arithmetic mean coliforms not exceed 5,000/100, except 20% of samples may exceed this if no more than 5% exceed 20,000/100.

Vermont

Class A (PWS with disinfection): Total coliforms not exceed 100/100. Fecal coliform: none attributable to discharge of domestic or industrial wastes.

Class B (PWS with treatment; bathing): Total coliforms not exceed 500/100. Fecal coliform not exceed 200/100.

Class C (secondary contact recreation): Fecal coliforms not to exceed 1,000/100.

Virginia

In all surface waters, except those areas where public or leased private shellfish beds are present, the fecal coliform bacteria shall not exceed a log mean of 200/100 ml with not more than 10% of total samples during any 30-day period exceeding 400/100 ml. Evaluation should be determined by either multi-tube fermentation for marine waters or membrane filtration method for freshwaters and should be based upon not less than 10% of samples taken over not more than a 30-day period.

Shellfish - In all open ocean or estuarine waters capable of propagating shellfish or in specific areas where public or leased private shellfish beds are present, and including those waters on which condemnation or restricted classifications are established by State Department of Health, the following standard will aply: the median fecal coliform value for a sampling station shall not exceed an MPN of 14/100 of samples and not more than 10% of the samples shall exceed 43 for a 5-tube, 3-dilution test or 49 for a 3-tube, 3-dilution test.

Virgin Islands Class A (natural phenomena): No change.

Class B (primary contact recreation): Fecal coliforms not to exceed a geometric (log) mean of 70/100 ml by MF or MPN count.

Class C (secondary contact recreation): Fecal coliform not to exceed a geometric (log) mean od 1,000/100 ml by MF or MPN count.

Washington Statewide use classification system plus specific criteria for specific areas.

Class AA Extraordinary (all uses): Fecal coliforms not exceed median of 50/100 (fresh water) or 14/100 (marine) with less than 10% of samples exceeding 43/100 when associated with any fecal source.

Class A Excellent (PWS, swimming, shellfish reprod., rearing & harvest): Fecal coliforms not exceed median values of 100/100 (fresh water) with less than 10% of samples exceeding 200/100 when associated with any fecal source or same as AA (marine).

Class B Good (swimming, shellfish reproduction and rearing, and crustacea (crabs, shrimp, etc.) harvest): Fecal coliforms not exceed median values of 200/100, with less than 10% of samples exceeding 400/100 when associated with any fecal source.

Class C Fair (comm., nav., boating): Fecal coliforms not exceed median values of 200/100 when associated with any fecal source.

West Virginia Criteria are assigned by river basin.
Majority of river basins: Total coliforms not to exceed 1,000/100 monthly average, nor exceed this in 20% of samples, nor exceed 2,400/100 on any day.

Fecal coliform count shall not exceed 200/100 ml as a 30-day geometric mean based on not less than 5 samples during any 30-day period nor exceed 400/100 ml in more than 10% of all samples during any 30-day period.

Wisconsin Standards for Recreational Use. A sanitary survey and or evaluation to assure protection from fecal contamination is the chief criterion in determining the suitability of a surface water for recreational use. In addition, the following bacteriological guidelines are set forth:

> The membrane filter fecal coliform count shall not exceed 200 per 100 ml nor exceed 400 per 100 ml in more than 10% of all samples during any month.

Wisconsin (cont'd)

Intermediate Aquatic Life

Same as standards for recreational use.

Marginal Surface Waters

Same as standards for recreational use.

Wyoming

State established "Basic Water Quality Standards" plus standards for individual rivers.

Criteria assigned to specific areas: Fecal coliform not to exceed 200/100 as geometric mean of at least 5 samples, nor exceed 250/100 in any 1 sample.

During the recreation season (May 1 through September 30), wastes attributable to or influenced by the activities of man shall not be present in amounts which will cause fecal coliform concentrations to exceed a geometric mean of 200 fecal coliform groups per 100 milliliters (based on a minimum of not less than 5 samples obtained during separate 24-hour periods for any 30-day period), nor shall 10% of the samples exceed 400 groups per 100 milliliters during any 30-day period in the waters which have been identified as being suitable for full body contact recreation.

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