RESOLUTION OF THE
RESOURCES AND DEVELOPMENT COMMITTEE
OF THE 23rd NAVAJO NATION COUNCIL --- FIRST YEAR, 2015

AN ACTION

RELATING TO THE RESOURCES AND DEVELOPMENT COMMITTEE; APPROVING AMENDMENTS TO RCJY-48-10, THE NAVAJO NATION PRIMARY DRINKING WATER REGULATIONS

BE IT ENACTED:

Section One. Findings

A. Pursuant to 22 N.N.C. § 2507 (D)(1), the Director of the Navajo Nation Environmental Protection Agency is authorized to promulgate such regulations from time to time as may be necessary to carry out the provisions of the Navajo Nation Safe Drinking Water Act.

B. Pursuant to 2 N.N.C. § 2507 (D)(5), regulations shall be effective in accordance with their terms after approval by the Resources and Development Committee (formerly the Resources Committee) of the Navajo Nation Council.

C. On July 8, 2010, the Resources Committee approved RDCJY-48-10, the Navajo Nation Primary Drinking Water Regulations, attached hereto as Exhibit B.

Section Two. Approval of Amendments

The Navajo Nation hereby approves amendments to RCJY-48-10 (Exhibit B) the Amendments to the Navajo Nation Primary Water Regulations, attached hereto as Exhibit A.

CERTIFICATION

I, hereby, certify that the foregoing resolution was duly considered by the Resources and Development Committee of the 23rd Navajo Nation Council at a duly called meeting at Mexican Water Chapter House, Mexican Water, Navajo Nation (Utah), at which quorum was present and that same was passed by a vote of 5 in favor, 0 opposed, 0 abstain this 26th day of May, 2015.

Benjamin Bennett, Vice Chairperson
Resources and Development Committee
Of the 23rd Navajo Nation Council

Motion: Honorable Benjamin Bennett
Second: Honorable Leonard Tsosie
Vote: 5-0 (Vice Chairman Not Voting)

Navajo Nation Primary Drinking Water Regulations

AMENDMENTS

2015

Part III
SANITARY SURVEYS

§301 PURPOSE

Sanitary surveys, or on-site inspections, are conducted to evaluate public water systems for delivery of safe drinking water by assessing operation and maintenance practices, providing technical assistance, and determining compliance with the NNSDWA and the NNPDWR.

§302 AUTHORITY

Pursuant to the NNSDWA § 107(A), 22 N.N.C. § 2507(A), the Director has the authority to require PWSs to respond to significant deficiencies found in a sanitary survey, to conduct a Composite Correction Program (CCP), and to assure that PWSs implement any follow-up recommendations that result from the CCP.

§303 GUIDELINES FOR SANITARY SURVEYS

Sanitary surveys, or on-site inspections, will be performed by the PWSSP, in accordance with the United States Environmental Protection Agency, Region 9's *Conducting Sanitary Surveys of Public Water Systems Guidance*.

§304 SANITARY SURVEYS

A. Groundwater systems must provide the Director, at his/her request, any existing information that will enable the Director to conduct a sanitary survey.

B. For the purposes of this part, a "sanitary survey" as conducted by the Director, includes but is not limited to, an onsite review of the water source(s) (identifying sources of contamination by using results of source water assessments or other relevant information, where available), facilities, equipment, operation, maintenance, and monitoring compliance of a public water system to evaluate the adequacy of the system, its sources, and operations and the distribution of safe drinking water.

C. The sanitary survey must include an evaluation of the applicable components listed in paragraphs (C)(1) through (8) of this section:

1. Source,
2. Treatment,
3. Distribution system,
4. Finished water storage,
5. Pumps, pump facilities, and controls,
6. Monitoring, reporting, and data verification,
7. System management and operation, and
8. Operator compliance with PWSSP requirements.

§ 305 SCHEDULING OF SANITARY SURVEYS

A. The PWSSP will schedule surveys of all public water systems, as follows:

1. Each public water system that utilizes a groundwater source(s) will be surveyed, or inspected, on a two to five year frequency based on the compliance status.

2. Every surface water treatment plant will be inspected on an annual basis. The distribution system extending from the treatment plant will be inspected on a two to five year frequency.

3. Every public water system that utilizes unfiltered Groundwater Under the Direct Influence of Surface Water will be inspected annually.

   a. The public water system must be subject to an annual on-site inspection to assess the watershed control program and disinfection treatment process. Either the Director or a person approved by the Director must conduct the on-site inspection. The inspection must be conducted by competent individuals such as sanitary and civil engineers, sanitarians, or technicians who have experience and knowledge about the operation and maintenance of a public water system, and who have a sound understanding of public health principles and waterborne diseases. A report of the on-site inspection summarizing all findings must be prepared every year and forwarded to the Director. The on-site inspection must indicate to the Director's satisfaction that the watershed control program and disinfection treatment process

are adequately designed and maintained. The onsite inspection must include:

i. A review of the effectiveness of the watershed control program;

ii. A review of the physical condition of the source intake and how well it is protected;

iii. A review of the public water system's equipment maintenance program to ensure there is low probability for failure of the disinfection process;

iv. An inspection of the disinfection equipment for physical deterioration;

v. A review of operating procedures;

vi. A review of data records to ensure that all required tests are being conducted and recorded and disinfection is effectively practiced; and

vii. Identification of any improvements which are needed in the equipment, public water system maintenance and operation, or data collection.

4. Consecutive water systems will be inspected on a two to five year basis.

5. TNCWSs using only protected and disinfected ground water, as defined by the Director, must undergo subsequent sanitary surveys at least every ten years after the initial sanitary survey. The Director must review the results of each sanitary survey to determine whether the existing monitoring frequency is adequate and what additional measures, if any, the system needs to undertake to meet drinking water standards.

6. In conducting a sanitary survey of a system using groundwater, information on sources of contamination within the delineated wellhead protection area, pursuant to §1700 of these regulations, that was collected in the course of developing and implementing the program will be considered instead of collecting new information, if the information was collected since the last time the system was subject to a sanitary survey.

§ 306 **REPORTING**

1. A report of findings will be sent to the owner/operator within 30 days after the inspection has been completed. The report will outline the compliance status with the NNSDWA and the NNPDWR and any other deficiencies pertaining to the infrastructure, operation, and maintenance that may affect the delivery of safe drinking water. A courtesy copy will be forwarded to persons who participated in the sanitary survey.

2. The owner/operator shall respond to the report of findings and submit a compliance schedule that addresses each deficiency within45 days after the date of inspection.

§ 307 **INSPECTIONS OF NONCOMPLYING PUBLIC WATER SYSTEMS**

A. Public water systems that have been determined by the PWSSP to be in noncompliance will be inspected annually, or more frequently as needed, to bring the system into compliance.

B. The PWSSP will conduct follow-up inspections of systems in noncompliance. PWSSP will provide technical assistance to owners/operators in order to achieve compliance.

PART IV
SAMPLING AND ANALYTICAL REQUIREMENTS

§ 401 PURPOSE

The purpose of this part is to ensure that all sampling and analytical requirements are consistent with the NNSDWA and the NNPDWR. A monitoring schedule may be prepared by the Navajo PWSSP staff for use by the public water system owner/operator to ensure compliance with the monitoring requirements.

NOTE: Analytical methodologies for each contaminant group are listed in Appendix A.

§ 402 CERTIFIED LABORATORIES

A. For the purpose of determining compliance with §§ 404 through 415, Appendix A, C, and D, samples may be considered only if they have been analyzed by a laboratory approved by the EPA, except that measurements for alkalinity, calcium, conductivity, disinfectant residual, orthophosphate, pH, silica, temperature and turbidity may be performed by any person acceptable to the ~~EPA~~ NNEPA.

B. Nothing in these regulations shall be construed to preclude the Director or authorized representative(s) from taking samples or from using the results from such samples to determine compliance by a public water system owner or operator with applicable requirements of these regulations.

§ 403 SITE-SAMPLING PLAN REQUIREMENTS

All public water systems must collect total coliform samples at sites which are representative of water throughout the distribution system according to a written site-sampling plan. These site-sampling plans are subject to NNEPA review and approval. Public water systems must update their existing site-sampling plans upon promulgation of these regulations and every two years thereafter.

§ 404 MICROBIOLOGICAL SAMPLING AND ANALYTICAL REQUIREMENTS

This section describes the total coliform sampling and analytical requirements for all types of public water systems.

A. ROUTINE SAMPLING

1. The monitoring frequency for total coliforms for public water systems is based on the population served by the system, see Table 400.1.

TABLE 400.1 MINIMUM NUMBER OF TOTAL COLIFORM SAMPLES BASED ON POPULATION

POPULATION SERVED	MINIMUM NUMBER OF SAMPLES PER MONTH	POPULATION SERVED	MINIMUM NUMBER OF SAMPLES PER MONTH
25 to 1,000[1]	1	59,001 to 70,000	70
1,001 to 2,500	2	70,001 to 83,000	80
2,501 to 3,300	3	83,001 to 96,000	90
3,301 to 4,100	4	96,001 to 130,000	100
4,101 to 4,900	5	130.001 to 220,000	120
4,901 to 5,800	6	220,001 to 320,000	150
5,801 to 6,700	7	320,001 to 450,000	180
6,701 to 7,600	8	450,001 to 600,000	210
7,601 to 8,500	9	600,001 to 780,000	240
8,501 to 12,900	10	780,001 to 970,000	270
12,901 to 17,200	15	970,001 to 1,230,000	300
17,201 to 21,500	20	1,230,001 to 1,520,000	330
21,501 to 25,000	25	1,520,001 to 1,850,000	360
25,001 to 33,000	30	1,850,001 to 2,270,000	390
33,001 to 41,000	40	2,270,001 to 3,020,000	420
41,001 to 50,000	50	3,020,001 to 3,960,000	450
50,001 to 59,000	60	3,960,001 or more	480

[1]Includes public water systems which have at least 15 service connections, but serve fewer than 25 persons.

2. All public water systems must collect samples at regular time intervals throughout the month.

   a. Systems that use groundwater and serve 4,900 persons or fewer may collect all required samples on a single day only if they are taken from different sites.

   b. Systems serving 4,901 persons or more shall not collect all required samples on a single day.

   c. Systems that use Groundwater Under the Direct Influence of Surface Water shall not collect all required samples on a single day.

3. This subsection applies to a public water system that uses surface water or ground water under the direct influence of surface water and does not practice filtration in compliance with Part VIII - General Requirements for Surface Water Treatment.

   a. Each day the turbidity level of the source water exceeds 1 NTU, as specified in Appendix D § 801-D(C)(2), the system must collect at least one sample to be analyzed for the presence of total coliforms:

      i. The sample shall be collected near the first service connection.

      ii. The system shall collect this coliform sample within 24 hours of the first turbidity level exceedance.

   b. If the public water system, for logistical reasons outside the system's control, cannot have the sample analyzed within 30 hours of collection, the owner/operator shall contact the Director and request for a time extension.

   c. Sample results from this coliform sampling shall be included in determining compliance with the MCL for total coliforms in § 205.

4. The monitoring frequency for total coliforms for non-community water systems is as follows:

   a. A non-community water system using only ground water (except GWUDI) and serving 1,000 persons or fewer must monitor each calendar quarter that the system provides water to the public, except that the Director may reduce this monitoring frequency, in writing, if a sanitary survey shows that the system is free of sanitary defects.

      The Director cannot reduce the monitoring frequency for a non-community water system using only ground water (except GWUDI) and serving 1,000 persons or fewer to less than once/year.

   b. A non-community water system using only ground water (except GWUDI) and serving more than 1,000 persons during any month must monitor at the same frequency as a like-sized community water system, as specified in subsection (A)(1) of this section, except the Director may reduce this monitoring frequency, in writing, for any month the system serves 1,000 persons or fewer.

      The Director cannot reduce the monitoring frequency to less than once/year.

   c. A non-community water system using surface water, in total or in part, must monitor at the same frequency as a like-sized CWS as specified in subsection (A)(1) of this section, regardless of the number of persons it serves.

   d. A non-community water system using ground water under the direct influence of surface water, as defined in §104, must monitor at the same frequency as a like-sized CWS as specified in subsection (A)(1) of this section. The system must begin monitoring at this frequency beginning six months after the Director determines that the ground water is under the direct influence of surface water.

6. Special purpose samples, such as those taken to determine whether disinfection practices are sufficient following pipe placement, replacement, or repair, shall not be used to determine compliance with the MCL for total coliforms in § 205.

7. Repeat samples taken pursuant to subsection (B) of this section are not considered special purpose samples, and must be used to determine compliance with the MCL for total coliforms in § 205.

B. REPEAT SAMPLING

1. If a routine sample is total coliform-positive, the public water system must collect a set of repeat samples within 24 hours of being notified of the positive result.

   The Director may extend the 24-hour limit, on a case-by-case basis, if the system has a logistical problem in collecting the repeat samples within 24 hours that is beyond its control. In the case of an extension, the Director must specify how much time the system has to collect the repeat samples.

   a. Public water systems which collect two or more routine samples per month must collect a minimum of three repeat samples for each total coliform-positive sample found.

   b. Public water systems which collect one routine sample per month or fewer must collect a minimum of four repeat samples for each total coliform-positive found.

2. The system must collect at least one repeat sample from:

   a. the sampling tap where the original total coliform-positive sample was taken; and

   b. at least one repeat sample at a tap within five service connections upstream of the original sampling site; and

   c. at least one repeat sample at a sampling tap within five service connections downstream of the original sampling site.

   If a total coliform-positive sample is at the beginning or end of the distribution system, the owner/operator shall notify the Director. Upon notification, the Director will designate other sampling points to satisfy the number of repeat sample requirements.

3. Public water systems must collect all repeat samples on the same day.

   a. Except with the Director's approval, public water systems with a single service connection may collect:

      i. repeat samples each day for four consecutive days to meet the number of repeat sample requirements; or

      ii. a larger volume repeat sample(s) in one or more sample containers of any size, as long as the total volume collected is at least to 400 ml (300 ml for systems which collect more than one routine sample per month).

4. If one or more repeat samples in one set is total coliform-positive, the public water system must collect an additional set of repeat samples in the manner specified in subsections (B)(1) through (3) of this section.

   a. The additional samples must be collected within 24 hours of being notified of the positive result, unless the Director extends the limit as provided in subsection (B)(1) of this section.

   b. The water system must repeat this process until:

      i. either total coliforms are not detected in one complete set of repeat samples; or

      ii. the system determines that the MCL for total coliforms in § 205 has been exceeded and notifies the Director.

5. If a system collecting less than five routine samples per month has one or more total coliform-positive samples and the Director does not invalidate the sample(s) under subsection (D) of this section, then the water system must collect at least five routine samples during the next month the system provides water to the public.

   The Director may waive this requirement if (a) or (b) below are met:

   a. The Director may waive the requirement to collect five routine samples if the PWSSP performs a site visit before the end of the next month the system provides water

to the public. Although a sanitary survey need not be performed, the site visit must be sufficiently detailed to allow the Director to determine whether additional monitoring and/or any corrective action is needed. The Director cannot approve an employee of the public water system to perform this site visit, even if the employee is an agent approved by the Director to perform sanitary surveys; or

b. The Director may waive the requirement to collect five routine samples if the Director has determined why the sample was total coliform-positive and establishes that the system has corrected the problem or will correct the problem before the end of the next month the system serves water to the public.

i. The Director must document this decision to waive the following month's additional monitoring requirement in writing and make this document available to the EPA and the public.

ii. The written documentation must describe the specific cause of the total coliform-positive sample and what action the system has taken, and/or will take, to correct this problem.

iii. The Director cannot waive the requirement to collect five routine samples the next month the system provides water to the public solely on the grounds that all repeat samples are total coliform-negative.

iv. Under this subsection, a system must still take at least one routine sample before the end of the next month it serves water to the public and use it to determine compliance with the MCL for total coliforms in § 205, unless the Director has determined that the system has corrected the contamination problem before the system took the set of repeat samples required in subsections (B)(1) through (4) of this section, and all repeat samples were total coliform-negative.

c. The Director cannot waive the requirement for a system to collect repeat samples in subsections (B)(1) through (4) of this section.

6. After a system collects a routine sample and before it learns the results of the analysis of that sample, if it collects another routine sample(s) from within five adjacent service connections of the initial sample, and the initial sample, after analysis, is found to contain total coliforms, then the system may count the subsequent sample(s) as a repeat sample instead of as a routine sample.

7. Results of all routine and repeat samples not invalidated by the Director must be included in determining compliance with the MCL for total coliforms in § 205.

C. REDUCED MONITORING

If a community water system serving 25 to 1,000 persons has no history of total coliform contamination in its current configuration and a sanitary survey conducted in the past five years shows that the system is supplied solely by a protected groundwater source and is free of sanitary defects, the Director may reduce the monitoring frequency to less than one sample per quarter. The Director must approve the reduced monitoring frequency in writing.

D. INVALIDATION OF TOTAL COLIFORM SAMPLES

A total coliform-positive sample invalidated under this subsection (D) does not count towards meeting the minimum sampling requirements of this section.

1. The Director may invalidate a total coliform-positive sample only if the following conditions are met:

a. The laboratory establishes that improper sample analysis caused the total coliform-positive result; or

b. The Director, on the basis of the results of repeat samples collected as required by subsections (B)(1) through (4) of this section, determines that the total coliform-positive sample resulted from a domestic or other non-distribution system plumbing problem. The Director cannot invalidate a sample on the basis of a repeat sample result unless all repeat sample(s) collected at the same tap as the original total coliform-positive sample are also total coliform-positive, and all repeat

samples collected within five service connections of the original tap are total coliform-negative (e.g., the Director cannot invalidate a total coliform-positive sample on the basis of repeat samples if all the repeat samples are total coliform-negative, or if the public water system has only one service connection); or

c. The Director has substantial grounds to believe that a total coliform-positive result is due to a circumstance or condition which does not reflect water quality in the distribution system. In this case, the system must still collect all repeat samples required under subsections (B)(1) through (4) of this section, and use them to determine compliance with the MCL for total coliforms in § 205.

i. To invalidate a total coliform-positive sample under this subsection, the decision with the rationale for the decision must be documented in writing, approved and signed by the Director.

ii. The Director shall make this document available to EPA and the public.

iii. The written documentation must state the specific cause of the total coliform-positive sample, and what action the system has taken, or will take, to correct this problem.

iv. The Director may not invalidate a total coliform-positive sample solely on the grounds that all repeat samples are total coliform-negative.

2. A laboratory must invalidate a total coliform sample (unless total coliforms are detected) if the sample;

a. produces a turbid culture in the absence of gas production using an analytical method where gas formation is examined (e.g., the Multiple-Tube-Fermentation Technique); or

b. produces a turbid culture in the absence of an acid reaction in the Presence-Absence (P-A) Coliform Test; or

c. exhibits confluent growth with an analytical method using a membrane filter (e.g., Membrane Filter Technique); or

d. produces colonies too numerous to count with an analytical method using a membrane filter (e.g., Membrane Filter Technique).

If a laboratory invalidates a sample due to (a) through (d) of the above, then the system must collect another sample from the original sample location within 24 hours of being notified of the interference problem, and have it analyzed for the presence of total coliforms. The system must continue to resample within 24 hours and have the samples analyzed until it obtains a valid result. The Director may waive the 24-hour time limit on a case-by-case basis.

E. FECAL COLIFORMS/*ESCHERICHIA coli (E.coli)* TESTING

1. If any routine or repeat sample is total coliform-positive, the system must analyze the same total coliform-positive culture medium to determine if fecal coliforms are present, or the system may test for *E. coli* in lieu of fecal coliforms.

If fecal coliforms or *E. coli* are present, the system must notify the Director by the end of the business day when the system is notified of the test result, unless the system is notified of the result after the Director's office is closed, in which case the system must notify the Director before the end of the next business day.

2. The Director has the discretion to allow a public water system, on a case-by-case basis, to forgo fecal coliform or *E. coli* testing on a total coliform-positive sample if that system assumes that the total coliform-positive sample is fecal coliform-positive or *E. coli*-positive. Accordingly, the system must notify the Director as specified in subsection (E)(1) of this section and the provisions of § 205 shall apply.

F. RESPONSE TO VIOLATION

1. A public water system which has exceeded the MCL for total coliforms and other

microbiological contaminants in § 205 must report the violation to the Director no later than the end of the next business day after learning of the violation, and must notify the public in accordance with § 604.

2. A public water system which has failed to comply with a coliform sampling requirement, including the sanitary survey requirement, must report the sampling violation to the Director within ten days after the system discovers the violation, and must notify the public in accordance with § 604.

§ 405 SAMPLING AND ANALYTICAL REQUIREMENTS FOR INORGANIC CHEMICALS

CWSs and NTNCWSs shall conduct sampling and analyses to determine compliance with the MCLs (antimony, arsenic, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, selenium and thallium) specified in § 203 in accordance with this section.

Each public water system shall sample at the time designated by the Director during each three-year compliance period.

A. Sampling and analyses shall be conducted as follows:

1. Groundwater systems shall take a minimum of one sample at every entry point to the distribution system which is representative of each well after treatment and have the sample(s) analyzed. The system shall take each sample at the same sampling point unless conditions make another sampling point more representative of each source or treatment plant.

2. Surface water systems shall take a minimum of one sample at every entry point to the distribution system after any application of treatment or in the distribution system at a point which is representative of each source after treatment and have the sample(s) analyzed. The system shall take each sample at the same sampling point unless conditions make another sampling point more representative of each source or treatment plant.

   NOTE: For purposes of this subsection surface water systems include systems with a combination of surface and groundwater sources.

3. If a system draws water from more than one source and the sources are combined before entering the distribution system, the system must obtain a sample at an entry point to the distribution system during periods of normal operation (i.e., all the sources are in use and ample time is allowed for water from the furthest source to reach the sampling point).

B. The frequency of sampling and analyses conducted to determine compliance with the MCLs specified in § 203 for antimony, arsenic, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, selenium and thallium shall be as follows:

1. Groundwater systems shall take one sample at each sampling point once every three years. Surface water systems, combined surface/ground water systems or GWUDI shall take one sample annually at each sampling point.

2. All new systems or systems that use a new source of water and that will begin operation after January 22, 2004 must demonstrate compliance with the arsenic MCL within a period of time specified by the Director. The system must also comply with the initial sampling frequencies specified by the Director to ensure a system can demonstrate compliance with the arsenic MCL. Routine and increased monitoring frequencies shall be conducted in accordance with the requirements in this section.

C. Composite Samples for Inorganic Chemicals:

Composite samples from a maximum of five samples is allowed, provided that the public water system notify the Director in writing and that the detection limit of the method used for analysis is less than one-fifth of the MCL. Detection limits for each analytical method and MCLs for each inorganic contaminant are listed in Appendix A, Table 400-A-2. Compositing of samples must be done in the laboratory.

1. If the concentration in the composite sample is greater than or equal to one-fifth of the MCL of any inorganic chemical, then a follow-up sample must be taken within 14 days at each sampling point included in the composite. These samples must be analyzed for the contaminants which exceeded one-fifth of the MCL in the composite sample.

2. If the population served by the system is greater than 3,300 persons, then compositing may

only be allowed by the Director at sampling points within a single system.

In systems serving less than or equal to 3,300 persons, compositing may be allowed among different systems provided that the 5-sample limit is maintained.

3. If duplicates of the original sample taken from each sampling point used in the composite are available, then the system may use the duplicates instead of resampling. The duplicates must be analyzed and the results reported to the Director within 14 days after completing analysis of the composite sample, provided the holding time of the sample is not exceeded.

D. Confirmation Samples:

1. If analytical results indicate an exceedance of the MCL for antimony, arsenic, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, selenium or thallium:

a. The public water system must collect one sample as soon as possible after the initial sample was taken (but not to exceed two weeks) at the same sampling point.

E. Compliance with the MCLs listed in § 203 shall be determined based on analytical result(s) obtained at each sampling point.

1. For public water systems which collect more than one sample per year, compliance with the MCLs for antimony, arsenic, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, selenium or thallium is determined by a running annual average at any sampling point.

a. If the average at any sampling point is greater than the MCL, then the system is out of compliance.

b. If any one sample would cause the annual average to be exceeded, then the system is out of compliance immediately.

c. Any sample below the method detection limit shall be calculated as zero for the purpose of determining the annual average.

d. If a system fails to collect the required number of samples, compliance (average concentration) will be based on the total number of samples collected.

2. For public water systems which are sampling annually, or less frequently, the system is out of compliance with the MCLs for antimony, arsenic, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, selenium, or thallium if the level of a contaminant at any sampling point is greater than the MCL. If a confirmation sample is required by the Director, the determination of compliance will be based on the average of the two samples. If a public water system fails to collect the required number of samples, compliance (average concentration) will be based on the total number of samples collected.

a. Arsenic sampling results will be reported to the nearest 0.001 mg/L

3. If a public water system has a distribution system separable from other parts of the distribution system with no interconnections, the Director may allow the public water system to give public notice to only the area served by that portion of the distribution system which is out of compliance.

F. Response to Violations of the MCL for Inorganic Chemicals

1. Compliance with the MCLs listed in § 203 shall be determined based on analytical result(s) obtained at each sampling point as required in subsection (E) of this section.

2. The Director has the authority to determine compliance or initiate enforcement action based upon analytical results and other information compiled by his/her authorized representative(s).

3. If the result of an analysis indicates that the level of arsenic listed in § 203 exceeds the MCL, then;

a. the public water system owner or operator shall report to the Director within seven days, and

b. initiate three additional analyses at the same sampling point within one month.

4. When the average of four analyses made, pursuant to subsection (3) of this section, rounded to the same number of significant figures as the MCL for arsenic exceeds the MCL, the water system owner or operator shall:

a. notify the Director pursuant to § 502; and

b. give notice to the public pursuant to § 603.

Sampling after public notification shall be at a frequency designated by the Director and shall continue until the MCL has not been exceeded in two successive samples or until a sampling schedule as a condition to a variance, exemption or enforcement action shall become effective.

G. Waivers

1. The system may apply to the Director, in writing, for a waiver from the sampling frequencies specified in subsection (B)(1) of this section.

a. The Director may grant a public water system a waiver for sampling of "free" cyanide, provided that the Director determines that the water system is not vulnerable due to lack of any industrial source of cyanide.

2. A condition of the waiver shall require that a public water system take a minimum of one sample while the waiver is effective. The term during which the waiver is effective shall not exceed one nine-year compliance cycle.

3. The Director may grant a waiver provided surface water systems have sampled annually for at least three years and groundwater systems have conducted a minimum of three rounds of sampling. Both surface and groundwater systems shall demonstrate that all previous analytical results were below the MCL.

4. Systems that use a new water source are not eligible for a waiver until three rounds of sampling from the new source have been completed.

5. In determining the appropriate reduced sampling frequency, the Director shall consider:

a. Reported concentrations from all previous sampling;

b. The degree of variation in reported concentrations; and

c. Other factors which may affect contaminant concentrations such as changes in groundwater pumping rates, changes in the system's configuration, changes in the system's operating procedures, or changes in stream flows or characteristics.

6. A decision by the Director to grant a waiver shall be made in writing and shall set forth the basis for the determination. The public water system shall specify the basis for its request. The Director shall review and, where appropriate, revise its determination of the appropriate sampling frequency when the system submits new sampling data or when other data relevant to the system's appropriate sampling frequency become available.

7. Systems which exceed the MCLs as calculated in subsection (E)(1) of this section shall sample quarterly beginning in the next quarter after the violation occurred.

8. The Director may decrease the quarterly sampling requirement to the frequencies specified in subsections (B)(1) and (G)(1) of this section provided that the system is reliably and consistently below the MCL. In no case can the Director make this determination unless a groundwater system takes a minimum of two quarterly samples and a surface water system takes a minimum of four quarterly samples.

§ 406 SAMPLING AND ANALYTICAL REQUIREMENTS FOR ASBESTOS

A. Sampling and analyses shall be conducted as follows:

The frequency of sampling conducted to determine compliance with the MCL for asbestos specified in § 203 shall be conducted as follows:

1. Each CWS and NTNCWS is required to sample for asbestos during the first three-year compliance period of each nine-year compliance cycle.

B. Confirmation Sampling for Asbestos

1. If the initial sample exceeds the MCL for asbestos, then the public water system must collect a confirmation sample immediately after the initial asbestos sample was taken (but not to exceed two weeks) at the same sampling point.

C. Compliance with the MCL for Asbestos

1. For public water systems which collect more than one sample per year, compliance with the MCLs for asbestos is determined by a running annual average at any sampling point.

   a. If the average at any sampling point is greater than the MCL, then the system is out of compliance.

   b. If any one sample would cause the annual average to be exceeded, then the system is out of compliance immediately.

   c. Any sample below the detection limit shall be calculated as zero for the purpose of determining the annual average.

   d. If a system fails to collect the required number of samples, compliance (average concentration) will be based on the total number of samples collected.

2. For systems which are sampling annually, or less frequently, the system is out of compliance with the MCLs for asbestos if the level of the contaminant at any sampling point is greater than the MCL. If a confirmation sample is required by the Director, the determination of compliance will be based on the average of the two samples. If a public water system fails to collect the required number of samples, compliance (average concentration) will be based on the total number of samples collected.

3. If a public water system has a distribution system separable from other parts of the distribution system with no interconnections, the Director may allow the system to give public notice to only the area served by that portion of the system which is out of compliance.

D. Response to Violations of the MCL for Asbestos

1. A system which exceeds the MCLs as determined in subsection (C) of this section shall sample quarterly beginning in the next quarter after the violation occurred.

2. The Director may decrease the quarterly sampling requirement to the frequency specified in subsection (A) of this section provided the Director has determined that the system is reliably and consistently below the MCL. In no case can the Director make this determination unless a groundwater system takes a minimum of two quarterly samples and a surface (or combined surface/ground) water system takes a minimum of four quarterly samples.

3. The Director has the authority to determine compliance or initiate enforcement action based upon analytical results and other information compiled by his/her authorized representative(s).

E. Waivers

1. The public water system may apply to the Director to waive the asbestos requirement based on the following conditions;

   a. the system is not vulnerable to asbestos contamination in its source water; and/or

   b. contamination due to corrosion of asbestos-cement pipe(s).

2. If the Director grants the waiver, then the system is not required to sample during that specified nine-year compliance cycle. A waiver remains in effect until the completion of the nine-year compliance cycle.

   a. Systems not receiving a waiver must sample and analyze in accordance with the provisions of subsection (A) of this section.

3. A system vulnerable to asbestos contamination due solely to corrosion of asbestos-cement pipe shall take one sample at a tap served by asbestos-cement pipe and where asbestos contamination is most likely to occur.

4. A system vulnerable to asbestos contamination due solely to source water shall sample in accordance with the provisions of subsection (A) of this section.

5. A system vulnerable to asbestos contamination due to both its source water supply and corrosion of asbestos-cement pipe shall take one sample at a tap served by asbestos-cement pipe and where asbestos contamination is most likely to occur.

§ 407 SAMPLING AND ANALYTICAL REQUIREMENTS FOR NITRATE

All public water systems shall collect a sample at each entry point to the distribution system after treatment to determine compliance with the MCL for nitrate in § 203.

A. Sampling and analyses shall be conducted as follows:

1. All public water systems served by groundwater systems shall sample annually. Surface water systems, combined surface and groundwater systems, or GWUDI shall take one sample quarterly.

2. For all public water systems, the repeat sampling frequency for groundwater systems shall be quarterly for at least one year following any one sample in which the concentration is greater than or equal to fifty percent (≥50%) of the MCL. The Director may allow a groundwater system to reduce the sampling frequency to annually after four consecutive quarterly samples are reliably and consistently below the MCL.

3. For CWSs and NTNCWSs, the Director may allow a surface water system, combined surface and groundwater systems, or GWUDI to reduce the sampling frequency to annually if all analytical results from four consecutive quarters are less than fifty percent (<50 %) of the MCL. A surface water system shall return to quarterly sampling if any one sample is ≥50 % of the MCL.

4. After the completed round of quarterly sampling, each CWS and NTNCWS which is sampling annually shall take subsequent samples during the quarter(s) which previously resulted in the highest analytical result.

B. Confirmation samples for Nitrate

1. If analytical results indicate an exceedance of the MCL for Nitrate:

a. The public water system shall collect a confirmation sample within 24 hours upon notification of the analytical result(s).

b. Systems unable to comply with the 24-hour sampling requirement must:

i. immediately notify persons served by the public water system in accordance with § 603 and 604 and meet other Tier 1 public notification requirements under Part VI of these regulations; and,

ii. collect and analyze a confirmation sample within two weeks of notification of the analytical results of the first sample.

2. If a Director-required confirmation sample is taken for Nitrate, then the results of the initial and confirmation sample shall be averaged. The resulting average shall be used to determine the system's compliance in accordance with subsection (C) of this section. The Director has the discretion to delete results of obvious sampling errors.

C. Compliance with the MCL for Nitrate

1. Compliance with the MCL for nitrate is determined based on one sample, if the levels are below the MCL. If the levels of nitrate exceed the MCL in the initial sample, a confirmation sample is required and compliance shall be determined based on the average of the initial and confirmation samples.

2. If a public water system has a distribution system separable from other parts of the distribution system with no interconnections, the Director may allow the system to give public notice to only the area served by that portion of the distribution system which is

out of compliance.

D. Response to Violations of the MCL for Nitrate

1. The Director may require more frequent sampling or may require confirmation samples for results that exceed the MCL.

2. The Director has the authority to determine compliance or initiate enforcement action based upon analytical results and other information compiled by the Director's authorized representative(s).

3. If the result of an analysis indicates that the level of nitrate listed in § 203 exceeds the MCL, the public water system owner or operator shall:

   a. report to the Director within seven days; and

   b. initiate three additional analyses at the same sampling point within one month.

4. When the average of four analyses made pursuant to subsection (3) of this section, rounded to the same number of significant figures as the MCL for nitrate exceeds the MCL, the public water system owner or operator shall:

   a. notify the Director pursuant to § 502; and

   b. give notice to the public pursuant to § 603.

   Sampling after public notification shall be at a frequency designated by the Director and shall continue until the MCL has not been exceeded in two successive samples or until a sampling schedule as a condition to a variance, exemption or enforcement action shall become effective.

5. The provisions of subsections (3) and (4) of this section notwithstanding, compliance with the MCL for nitrate shall be determined on the basis of the mean of two analyses. When a level exceeding the MCL for nitrate is found, a second analysis shall be initiated within twenty-four hours, and if the mean of the two analyses exceeds the MCL, the public water system owner or operator shall report the findings to the Director pursuant to § 502 and shall notify the public pursuant to § 603.

E. Waivers

There are no waivers of the nitrate sampling requirements.

§ 408 SAMPLING AND ANALYTICAL REQUIREMENTS FOR NITRITE

All public water systems shall sample to determine compliance with the MCL for nitrite in § 203.

A. Sampling and analyses shall be conducted as follows:

1. All public water systems served by groundwater shall sample at a frequency specified by the Director. Surface water systems, combined surface and groundwater systems, or GWUDI shall take one sample annually.

2. All public water systems shall take one sample at each entry point to the distribution system after treatment.

B. Confirmation samples for Nitrite

1. If analytical results indicate an exceedance of the MCL for Nitrite:

   a. The public water system must collect a confirmation sample within 24 hours upon receiving the analytical result(s).

   b. Systems unable to comply with the 24-hour sampling requirement must:

      i. immediately notify persons served by the public water system in accordance with § 605 and 606 and meet other Tier 1 public notification requirements under Part VI of these regulations; and,

ii. collect and analyze a confirmation sample within two weeks of notification of the analytical results.

C. Compliance with the MCL for Nitrite

1. Compliance with the MCL for nitrite is determined based on one sample, if the levels are below the MCL. If the levels of nitrite exceed the MCL in the initial sample, a confirmation sample is required and compliance shall be determined based on the average of the initial and confirmation samples.

2. All public water systems where an analytical result for nitrite is <50 % of the MCL shall sample at the frequency specified by the Director.

3. The repeat sampling frequency for any public water system whose concentration is ≥50 % of the MCL, shall sample quarterly for at least one year. The Director may allow a system to reduce the sampling frequency to annually after determining the system is reliably and consistently below the MCL.

4. Public water systems which are sampling annually shall take each subsequent sample during the quarter(s) which previously resulted in the highest analytical result.

5. If a public water system has a distribution system separable from other parts of the distribution system with no interconnections, the Director may allow the system to give public notice to only the area served by that portion of the distribution system which is out of compliance.

D. Response to Violations of the MCL for Nitrite

1. The Director may require more frequent sampling or may require confirmation samples for results that exceed the MCL.

2. The Director has the authority to determine compliance or initiate enforcement action based upon analytical results and other information compiled by the Director's authorized representative(s).

E. Waivers

There shall be no waivers of the nitrite sampling requirements.

§ 409 SAMPLING AND ANALYTICAL REQUIREMENTS FOR VOLATILE ORGANIC CHEMICALS

CWSs and NTNCWSs shall conduct sampling and analyses to determine compliance with the MCLs listed in § 204, Table 200.3 (1) through (21), in accordance with this section.

Each public water system shall sample at the time designated by the Director during each three-year compliance period.

A. Sampling and analyses shall be conducted as follows:

1. Groundwater systems shall take a minimum of one sample at every entry point to the distribution system after treatment and have the samples analyzed (hereafter called a sampling point). Each sample must be taken at the same sampling point unless conditions make another sampling point more representative of each source, or treatment plant within the distribution system.

2. Surface water systems, or water systems using a combination of surface/ground or GWUDI, shall take a minimum of one sample at each entry point to the distribution system after treatment and have the samples analyzed.

Each sample must be taken at the same sampling point unless conditions make another sampling point more representative of each source, or treatment plant within the distribution system.

3. If a system draws water from more than one source and the sources are combined before entering the distribution system, the system must obtain a sample at an entry point to the distribution system during periods of normal operation (i.e., all the sources are in use and ample time is allowed for water from the furthest source to reach the sampling point).

4. Each CWS and NTNCWS shall take four consecutive quarterly samples for each contaminant listed

in § 204, Table 200.3 (2) through (21) during each three-year compliance period.

5. If the initial sampling for contaminants listed in § 204, Table 200.3 (1) through (21) have been conducted and the systems did not detect any contaminant listed in Table 200.3 (1) through (21), then each ground and surface water system shall take one sample annually beginning with the initial three-year compliance period.

6. After a minimum of three years of annual sampling, the Director may allow groundwater systems with no previous detection of any contaminant listed in § 204, Table 200.3 to take one sample during each three-year compliance period.

7. The Director may reduce the total number of samples a system must analyze by allowing the use of compositing. Composite samples from a maximum of five sampling points are allowed, provided that the detection limit of the method used for analysis is less than one-fifth of the MCL. Compositing of samples must be done in the laboratory and analyzed within 14 days of sample collection.

   a. If the concentration in the composite sample is greater than or equal to 0.0005 mg/L for any contaminant listed in § 204, Table 200.3 (1) through (21) then a follow-up sample must be taken and analyzed within 14 days from each sampling point included in the composite, and be analyzed for that contaminant.

   b. If duplicates of the original sample taken from each sampling point used in the composite are available, the system may use these instead of resampling. The duplicate must be analyzed and the results reported to the Director within 14 days after completing analysis of the composite sample, provided the holding time of the sample is not exceeded.

   c. If the population served by the system is > 3,300 persons, then compositing may only be permitted by the Director at sampling points within a single system. In systems serving ≤ 3,300 persons, the Director may permit compositing among different systems provided the 5-sample limit is maintained.

B. Confirmation samples for Volatile Organic Chemicals

1. The Director may require a confirmation sample for positive or negative results. If a confirmation sample is required by the Director, the result must be averaged with the first sampling result and the average is used for the compliance determination as specified in subsection (D) of this section. The Director will delete the results of obvious sampling errors from this calculation.

C. Detection Limits for Volatile Organic Chemicals

1. If a contaminant listed in Table 200.3 (2) through (21) is detected at a level exceeding 0.0005 mg/L in any sample, then:

   a. The system must sample quarterly at each sampling point which resulted in a detection.

   b. The Director may decrease the quarterly sampling requirement specified in subsection (C)(1)(a) of this section provided it has determined that the system is reliably and consistently below the MCL. In no case shall the Director make this determination unless a groundwater system takes a minimum of two quarterly samples and a surface water system takes a minimum of four quarterly samples.

   c. If the Director determines that the system is reliably and consistently below the MCL, the Director may allow the system to sample annually. Systems which sample annually must sample during the quarter(s) which previously yielded the highest analytical result.

   d. Systems which have three consecutive annual samples with no detection of a contaminant may apply to the Director for a waiver as specified in subsection (F)(2) of this section.

   e. Groundwater systems which have detected one or more of the following two-carbon organic compounds:

      i. trichloroethylene, tetrachloroethylene, 1,2-dichloroethane, 1,1,1-trichloroethane, cis-1,2-dichloroethylene,

trans-1,2-dichloroethylene, or 1,1-dichloroethylene, shall sample quarterly for vinyl chloride.

ii. A vinyl chloride sample shall be taken at each sampling point at which one or more of the two-carbon organic compounds was detected. If the results of the first analysis do not detect vinyl chloride, the Director may reduce the quarterly sampling frequency of vinyl chloride sampling to one sample during each three-year compliance period.

iii. Surface water systems are required to sample for vinyl chloride as specified by the Director.

D. Compliance with § 204, Table 200.3 (1) through (21) shall be determined based on the analytical results obtained at each sampling point. If one sampling point is in violation of an MCL, the system is in violation of the MCL.

1. For public water systems which collect more than one sample per year, compliance with the MCLs listed in § 204, Table 200.3 (1) through (21) is determined by a running annual average at each sampling point.

a. Systems monitoring annually or less frequently whose sample result exceeds the MCL must begin quarterly sampling. The system will not be considered in violation of the MCL until it has completed one year of quarterly sampling.

b. If any one sample would cause the annual average to exceed the MCL, then the system is out of compliance immediately.

c. If a system fails to collect the required number of samples, compliance will be based on the total number of samples collected.

d. Any sample below the detection limit shall be calculated at zero for the purpose of determining the annual average.

2. All new systems or systems that use a new source of water that begin operation after January 22, 2004 must demonstrate compliance with the MCL within a period of time specified by the Director. The system must also comply with the initial sampling frequencies specified by the Director to ensure a system can demonstrate compliance with the MCL. Routine and increased monitoring frequencies shall be conducted in accordance with the requirements in this section.

E. Response to Violations of the MCL for Volatile Organic Chemicals

1. Systems which violate the requirements of § 204, Table 200.3 (1) through (21), as determined by subsection (D) of this section, must sample quarterly. After a minimum of four consecutive quarterly samples which show the system is in compliance as specified in subsection (D) of this section and the system and the Director determines that the system is reliably and consistently below the MCL, the system may sample at the frequency and times specified in subsection (C)(1)(c) of this section.

2. The Director may increase required sampling where necessary to detect variations within the system.

F. Waivers

1. Each CWS and NTNCWS groundwater system which does not detect a contaminant listed in § 204, Table 200.3 (1) through (21) may apply to the Director for a waiver from the requirements of subsections (A)(5) and (6) of this section after completing the initial sampling of each nine-year compliance cycle. (For the purposes of this section detection is defined as ≥ to 0.0005 mg/L.)

a. A waiver shall be effective for no more than six years (two three-year compliance periods).

b. The Director may also issue waivers to small systems for the initial round of sampling for 1,2,4-trichlorobenzene.

2. The Director may grant a waiver after evaluating a vulnerability assessment survey which includes the following factor(s):

a. Knowledge of previous use (including transport, storage, or disposal) of the contaminant(s) within the watershed or zone of influence of the system. If a determination by the Director reveals no previous use of the contaminant(s) within the watershed or zone of influence, a waiver may be granted.

b. If previous use of the contaminant(s) is unknown or has been used previously, then the following factors shall be used to determine whether a waiver is granted.

i. Previous analytical results.

ii. The proximity of the system to a potential point or non-point source(s) of contamination. Point sources include, but are not limited to, spills and leaks of chemicals at or near a water treatment facility or at manufacturing, distribution, or storage facilities, or from hazardous and municipal waste landfills and other waste handling or treatment facilities.

iii. The environmental persistence and transport of the contaminants.

iv. The number of persons served by the water system and the proximity of a smaller system to a larger system.

v. How well the water source is protected against contamination whether it is a surface or groundwater system. Groundwater systems must consider factors such as depth of the well, the type of soil, and wellhead protection. Surface water systems must consider watershed protection.

3. As a condition of the waiver a groundwater system must:

a. Take one sample at each sampling point during the time the waiver is effective (i.e. one sample during two three-year compliance periods or six years); and

b. Update its vulnerability assessment survey every three years. If and when new potential sources of contamination have been identified to impact a drinking water source, then the vulnerability assessment survey must be updated and submitted to the Director.

c. Based on this vulnerability assessment the Director must reconfirm that the system is not vulnerable.

d. If the Director does not make this reconfirmation within three years of the initial determination, then:

i. The waiver is invalidated; and

ii. The system is required to sample annually as specified in subsection (A)(5) of this section.

4. Each CWS and NTNCWS surface water system which does not detect a contaminant listed in § 204, Table 200.3 (1) through (21) may apply to the Director for a waiver from the requirements of subsection (A)(5) of this section after completing the initial sampling of each nine-year compliance cycle.

a. Composite samples from a maximum of five sampling points are allowed, provided that the detection limit of the method used for analysis is less than one-fifth of the MCL.

b. Systems meeting this criterion must be determined by the Director to be non-vulnerable based on a vulnerability assessment survey during each three-year compliance period.

c. Each system receiving a waiver shall sample at the frequency specified by the Director (if any).

5. The Director may allow the use of monitoring data collected during the previous "nine-year" compliance cycle for purposes of initial sampling compliance. If the data are generally consistent with the other requirements of this section, the Director may use these data (i.e., single sample rather than four quarterly samples) to satisfy the initial sampling

requirement of subsection (A)(4) of this section. Systems which use grandfathered samples and did not detect any contaminant(s) listed in § 204, Table 200.3 (2) through (21) shall begin sampling annually in accordance with subsection (A)(5) of this section beginning with the initial three-year compliance period.

§ 410 SAMPLING AND ANALYTICAL REQUIREMENTS FOR SYNTHETIC ORGANIC CHEMICALS

CWSs and NTNCWSs shall conduct sampling and analyses to determine compliance with the MCLs listed in Table 200.4 (1) through (33) in § 204, in accordance with this section.

Each public water system shall conduct sampling and analyses at the time designated by the Director during each three-year compliance period.

For purposes of this section, surface water systems include systems with a combination of surface and groundwater sources.

A. Sampling and analyses shall be conducted as follows:

1. Groundwater systems shall take a minimum of one sample at every entry point to the distribution system after treatment and have the sample analyzed (hereafter called a sampling point). Each sample must be taken at the same sampling point unless conditions make another sampling point more representative of each source or treatment plant.

2. Surface water systems, or water systems using a combination of surface/ground or GWUDI, shall take a minimum of one sample at each entry point to the distribution system after treatment and have the samples analyzed.

   Each sample must be taken at the same sampling point unless conditions make another sampling point more representative of each source, or treatment plant within the distribution system.

3. If a public water system draws water from more than one source and the sources are combined before entering the distribution system, the public water system must obtain a sample at an entry point to the distribution system during periods of normal operation (i.e., all the sources are in use and ample time is allowed for water from the furthest source to reach the sampling point).

4. Sampling frequency:

   a. Each CWS and NTNCWS shall take four consecutive quarterly samples for each contaminant listed in § 204 (A)(2), Table 200.4, during each three-year compliance period beginning with the nine-year compliance cycle.

   b. Public water systems serving more than 3,300 persons which do not detect a contaminant in the initial three-year compliance period, of a nine-year compliance cycle, may reduce the sampling frequency to a minimum of two quarterly samples in one year during each of the three-year compliance periods.

   c. Public water systems serving less than or equal to 3,300 persons which do not detect a contaminant in the initial three-year compliance period may reduce the sampling frequency to a minimum of one sample during each of the three-year compliance periods.

5. The Director may reduce the total number of samples a public water system must analyze by allowing the use of compositing. Composite samples from a maximum of five sampling points are allowed, provided that the detection limit of the method used for analysis is less than one-fifth of the MCL. Compositing of samples must be done in the laboratory and analyzed within 14 days of sample collection.

   a. If the concentration in the composite sample detects one or more contaminants listed in § 204 (A)(2), then a follow-up sample must be taken and analyzed within 14 days from each sampling point included in the composite, and be analyzed for that contaminant.

   b. If duplicates of the original sample taken from each sampling point used in the composite are available, the system may use these instead of resampling. The duplicate must be analyzed and the results reported to the Director within 14 days after completing analysis of the composite sample, provided the holding time of the sample is not exceeded.

c. If the population served by the system is >3,300 persons, then compositing may only be permitted by the Director at sampling points within a single system. In systems serving ≤3,300 persons, the Director may permit compositing among different systems provided the 5-sample limit is maintained.

6. If sampling data are generally consistent with the requirements of subsection (A) of this section, then the Director may allow systems to use that data to satisfy the sampling requirement for the initial three-year compliance period.

7. The Director may increase the required sampling frequency, where necessary, to detect variations within the system (e.g. fluctuations in concentration due to seasonal use, changes in water source).

B. Confirmation samples for Synthetic Organic Chemicals

1. The Director may require a confirmation sample for positive or negative results. If a confirmation sample is required by the Director, the result must be averaged with the first sampling result and the average used for the compliance determination as specified by subsection (D)(1) of this section. The Director has the discretion to delete results of obvious sampling errors from this calculation.

C. Detection Limits for Synthetic Organic Chemicals

1. If an organic contaminant listed in § 204 (A)(2) is detected (as defined by subsection (C)(2) of this section) in any sample, then:

a. Each system must sample quarterly at each sampling point which resulted in a detection.

b. The Director may decrease the quarterly sampling requirement specified in subsection (C)(1) (a) of this section provided it has determined that the system is reliably and consistently below the MCL. In no case shall the Director make this determination unless a:

i. groundwater system takes a minimum of two quarterly samples; or

ii. surface water system takes a minimum of four quarterly samples.

c. After the Director determines the public water system is reliably and consistently below the MCL, the Director may allow the system to sample annually. Public water systems which sample annually must sample during the quarter that previously yielded the highest analytical result.

d. Public water systems which have 3 consecutive annual samples with no detection of a contaminant may apply to the Director for a waiver as specified in subsection (F)(2) of this section.

2. Detection, as used in this subsection, shall be defined as greater than or equal to the following concentrations for each contaminant.

TABLE 400.2 DETECTION LIMIT

CONTAMINANT	LIMIT (mg/l)
Alachlor	0.0002
Aldicarb	0.0005
Aldicarb sulfoxide	0.0005
Aldicarb sulfone	0.0008
Atrazine	0.0001
Benzo(a)pyrene	0.00002
Carbofuran	0.0009

Chlordane	0.0002
Dalapon	0.001
1,2-Dibromo-3-chloropropane (DBCP)	0.00002
Di(2-ethylhexyl) adipate	0.0006
Di(2-ethylhexyl) phthalate	0.0006
Dinoseb	0.0002
Diquat	0.0004
2,4-D	0.0001
Endothall	0.009
Endrin	0.00001
Ethylene dibromide (EDB)	0.00001
Glyphosate	0.006
Heptachlor	0.00004
Heptachlor epoxide	0.00002
Hexachlorobenzene	0.0001
Hexachlorocyclopentadiene	0.0001
Lindane	0.00002
Methoxychlor	0.0001
Oxamyl	0.002
Picloram	0.0001
Polychlorinated biphenyls (PCBs) (as decachlorobiphenyl)	0.0001
Pentachlorophenol	0.00004
Simazine	0.00007
Toxaphene	0.001
2,3,7,8-TCDD (Dioxin)	0.000000005
2,4,5-TP (Silvex)	0.0002

3. If PCBs (as one of seven Arochlors) are detected (as designated in this subsection) in any sample analyzed using Methods 505 or 508, the public water system shall re-analyze the sample using Method 508A to quantitate PCBs (as decachlorobiphenyl).

TABLE 400.3 DETECTION LIMIT OF PCB

AROCHLOR	DETECTION LIMIT (mg/l)
1016	0.00008
1221	0.02
1232	0.0005

1242	0.0003
1248	0.0001
1254	0.0001
1260	0.0002

a. Compliance with the PCB MCL shall be determined based upon the quantitative results of analyses using Method 508A.

D. Compliance with the MCL for Synthetic Organic Chemicals

1. Compliance with § 204 (A)(2) shall be determined based on the analytical results obtained at each sampling point. If one sampling point is in violation of an MCL, the system is in violation of the MCL.

a. For public water systems which are conducting sampling at a frequency greater than annual, compliance with the MCL is determined by a running annual average at each sampling point.

i. Public water systems monitoring annually or less frequently whose sample result exceeds the regulatory detection level as defined by subsection (C)(2) of this section must begin quarterly sampling. The system will not be considered in violation of the MCL until it has completed one year of quarterly sampling.

ii. If any sample result will cause the running annual average to exceed the MCL at any sampling point, the public water system is out of compliance with the MCL immediately.

iii. If a public water system fails to collect the required number of samples, compliance will be based on the total number of samples collected.

iv. If a sample result is less than the detection limit, zero will be used to calculate the annual average.

2. All new public water systems or systems that use a new source of water that begin operation after January 22, 2004 must demonstrate compliance with the MCL within a period of time specified by the Director. The system must also comply with the initial sampling frequencies specified by the Director to ensure a system can demonstrate compliance with the MCL. Routine and increased monitoring frequencies shall be conducted in accordance with the requirements in this section.

E. Response to Violations of the MCL for Synthetic Organic Chemicals

1. Public water systems which violate the requirements of § 204 (A)(2) as determined by subsection (D)(1) of this section must sample quarterly. After a minimum of four quarterly samples show the system is in compliance and the Director determines the public water system is reliably and consistently below the MCL, as specified in subsection (D)(1) of this section, the public water system shall sample at the frequency specified in subsection (C)(1)(c) of this section.

2. The Director has the authority to determine compliance or initiate enforcement action based upon analytical results and other information compiled by his/her authorized representative(s).

F. Waivers

1. Each CWS and NTNCWS may apply to the Director for a waiver from the requirement of subsection (A)(4) of this section. A public water system must reapply for a waiver for each three-year compliance period.

2. A Director may grant a waiver after evaluating the following factor(s):

a. Knowledge of previous use (including transport, storage, or disposal) of the

contaminant within the watershed or zone of influence of the public water system. If a determination by the Director reveals no previous use of the contaminant within the watershed or zone of influence, a waiver may be granted.

b. If previous use of the contaminant is unknown or it has been used previously, then the following factors shall be used to determine whether a waiver is granted.

i. Previous analytical results.

ii. The proximity of the public water system to a potential point or non-point source of contamination. Point sources include spills and leaks of chemicals at or near a water treatment facility or at manufacturing, distribution, or storage facilities, or from hazardous and municipal waste landfills and other waste handling or treatment facilities. Non-point sources include the use of pesticides to control insect and weed pests on agricultural areas, forest lands, home and gardens, and other land application uses.

iii. The environmental persistence and transport of the pesticide or PCBs.

iv. How well the water source is protected against contamination due to such factors as depth of the well and the type of soil and the integrity of the well casing.

v. Elevated nitrate levels at the water supply source.

vi. Use of PCBs in equipment used in the production, storage, or distribution of water (i.e., PCBs used in pumps, transformers, etc.).

§ 411 SAMPLING FREQUENCY AND COMPLIANCE REQUIREMENTS FOR RADIONUCLIDES IN COMMUNITY WATER SYSTEMS

A. Sampling, analysis, and compliance requirements for radionuclides.

Sampling and analyses for the following contaminants shall be conducted to determine compliance with § 209 (radioactivity) in accordance with the methods found in Appendix A. With the written permission of the Director, concurred in by the Administrator of the EPA, or their equivalent determined by EPA an alternate analytical technique may be employed in accordance with Appendix A § 401-A.

1. Community water systems (CWSs) must conduct initial monitoring to determine compliance with § 209(A) by December 31, 2007. For the purposes of monitoring for gross alpha particle activity, radium-226, radium-228, uranium, and beta particle and photon radioactivity in drinking water, "detection limit" is defined as in Appendix A § 405-A (C).

a. Applicability and sampling location for existing CWSs or sources. All existing CWSs using ground water, surface water or systems using both ground and surface water must sample at every entry point to the distribution system that is representative of all sources being used under normal operating conditions. The public water system must take each sample at the same sampling point unless conditions make another sampling point more representative of each source or the Director has designated a distribution system location, in accordance with subsection (A)(2)(b)(iii) of this section.

b. Applicability and sampling location for new CWSs or sources.

i. All new CWSs or CWSs that use a new source of water must begin to conduct initial monitoring for the new source within the first quarter after initiating use of the source.

ii. CWSs must conduct more frequent monitoring when ordered by the Director in the event of possible contamination or when changes in the distribution system or treatment processes occur which may increase the concentration of radioactivity in finished water.

2. Initial monitoring: Public water systems must conduct initial monitoring for gross alpha particle activity, radium-226, radium-228, and uranium as follows:

a. Public water systems without acceptable historical data, as defined below, must collect four consecutive quarterly samples at all sampling points before December 31, 2007.

b. Grandfathering of data: The Director may allow historical monitoring data collected at a sampling point to satisfy the initial monitoring requirements for that sampling point, for the following situations.

i. To satisfy initial monitoring requirements, a CWS having only one entry point to the distribution system may use the monitoring data from the last compliance monitoring period that began between June 2000 and December 8, 2003.

ii. To satisfy initial monitoring requirements, a CWS with multiple entry points and having appropriate historical monitoring data for each entry point to the distribution system may use the monitoring data from the last compliance monitoring period that began between June 2000 and December 8, 2003.

iii. To satisfy initial monitoring requirements, a CWS with appropriate historical data for a representative point in the distribution system may use the monitoring data from the last compliance monitoring period that began between June 2000 and December 8, 2003, provided that the Director finds that the historical data satisfactorily demonstrate that each entry point to the distribution system is expected to be in compliance based upon the historical data and reasonable assumptions about the variability of contaminant levels between entry points. The Director must make a written finding indicating how the data conforms to these requirements.

c. For gross alpha particle activity, uranium, radium-226, and radium-228 monitoring, the Director may waive the final two quarters of initial monitoring for a sampling point if the results of the samples from the previous two quarters are below the detection limit.

d. If the average of the initial monitoring results for a sampling point is above the MCL, the public water system must collect and analyze quarterly samples at that sampling point until the system has results from four consecutive quarters that are at or below the MCL, unless the public water system enters into another schedule as part of a formal compliance agreement with the Director.

3. Compositing: To fulfill quarterly monitoring requirements for gross alpha particle activity, radium-226, radium-228, or uranium, a public water system may composite up to four consecutive quarterly samples from a single entry point if analysis is done within a year of the first sample. The Director will treat analytical results from the composited as the average analytical result to determine compliance with the MCLs and the future monitoring frequency. If the analytical result from the composited sample is greater than ½ MCL, the Director may direct the system to take additional quarterly samples before allowing the system to sample under a reduced monitoring schedule.

4. A gross alpha particle activity measurement may be substituted for the required radium-226 measurement provided that the measured gross alpha particle activity does not exceed 5 pCi/l. A gross alpha particle activity measurement may be substituted for the required uranium measurement provided that the measured gross alpha particle activity does not exceed 15 pCi/l. The gross alpha measurement shall have a confidence interval of 95% (1.65σ, where σ is the standard deviation of the net counting rate of the sample) for radium-226 and uranium. When a public water system uses a gross alpha particle activity measurement in lieu of a radium-226 and/or uranium measurement, the gross alpha particle activity analytical result will be used to determine the future monitoring frequency for radium-226 and/or uranium. If the gross alpha particle activity result is less than detection, ½ the detection limit will be used to determine compliance and the future monitoring frequency.

B. Detection Limits for Radionuclides

For the purpose of sampling radioactivity concentrations in drinking water, the required sensitivity of the radioanalysis is defined in terms of a detection limit. The detection limit shall be that concentration which can be counted with a precision of ± 100% at the 95% confidence level (1.96 sigma, where sigma is the standard deviation of the net counting rate of the sample).

1. To determine compliance with Table 200.10, (#'s 1, 2 and 4) the detection limit shall not exceed the concentrations in Table 400.4.

Table 400.4 Detection Limits For Gross Alpha Particle Activity, Radium 226, Radium 228 and Uranium

Contaminant	Detection Limit
Gross alpha particle activity	3 pCi/L
Radium 226	1 pCi/L
Radium 228	1 pCi/L
Uranium	1μg/L

2. To determine compliance with § 209 (A)(1) (#3 - Beta particle and photon radioactivity), the detection limits shall not exceed the concentrations listed in Table 400.5.

TABLE 400.5 DETECTION LIMITS FOR MAN-MADE BETA PARTICLE AND PHOTON EMITTERS

RADIONUCLIDE	DETECTION LIMIT
Tritium	1,000 pCi/l
Strontium-89	10 pCi/l
Strontium-90	2 pCi/l
Iodine-131	1 pCi/l
Cesium-134	10 pCi/l
Gross Beta	4 pCi/l
Other Radionuclides	1/10 of the applicable limit

C. Compliance with the MCL for Radionuclides

1. The Director may require more frequent monitoring than specified in subsection (A) of this section, or may require confirmation samples at the Director's discretion. The results of the initial and confirmation samples will be averaged for use in compliance determinations.

2. Each public water system shall monitor at the time designated by the Director during each compliance period.

3. Compliance with § 209 (A) will be determined based on the analytical result(s) obtained at each sampling point. If one sampling point is in violation of an MCL, the system is in violation of the MCL.

   a. For public water systems sampling more than once per year, compliance with the MCL is determined by a running annual average at each sampling point. If the average of any sampling point is greater than the MCL, then the system is out of compliance with the MCL.

   b. For public water systems sampling more than once per year, if any sample result will cause the running average to exceed the MCL at any sample point, the system is out of compliance with the MCL immediately.

   c. Public water systems must include all samples taken and analyzed under the provisions of this section in determining compliance, even if that number is greater than the minimum required.

   d. If a public water system does not collect all required samples when compliance is based on a running annual average of quarterly samples, compliance will be based on the running average of the samples collected.

   e. If a sample result is less than the detection limit, zero will be used to calculate the annual average, unless a gross alpha particle activity is being used in lieu

of radium-226 and/or uranium. If the gross alpha particle activity result is less than detection, ½ the detection limit will be used to calculate the annual average.

4. The Director shall have the discretion to delete results of obvious sampling or analytic errors.

5. If the MCL for radioactivity set forth in § 209 (A) is exceeded, the operator of a CWS must give notice to the Director pursuant to § 502 and to the public as required by § 603.

D. Response to Violations of the MCL for Radionuclides

1. The Director has the authority to determine compliance or initiate enforcement action based upon analytical results or other information compiled by an authorized representative.

2. To judge compliance with the MCLs listed in § 209, averages of data shall be used and shall be rounded to the same number of significant figures as the MCL for the substance in question.

E. Reduced Monitoring

1. The Director may allow CWSs to reduce the future frequency of monitoring from once every three years to once every six or nine years at each sampling point, based on the following criteria.

a. If the average of the initial monitoring results for each contaminant (i.e., gross alpha particle activity, uranium, radium-226, or radium-228) is below the detection limit specified in Table 400.4, in § 411 (B)(1), the system must collect and analyze for that contaminant using at least one sample at that sampling point every nine years.

b. For gross alpha particle activity and uranium, if the average of the initial monitoring results for each contaminant is at or above the detection limit but at or below ½ the MCL, the system must collect and analyze for that contaminant using at least one sample at that sampling point every six years.

c. For combined radium-226 and radium-228, the analytical results must be combined.

i. If the average of the combined initial monitoring results for radium-226 and radium-228 is at or above the detection limit but at or below ½ the MCL, the CWS must collect and analyze for that contaminant using at least one sample at that sampling point every six years.

d. For gross alpha particle activity and uranium, if the average of the initial monitoring results for each contaminant is above ½ the MCL but at or below the MCL, the public water system must collect and analyze at least one sample at that sampling point every three years.

e. For combined radium-226 and radium-228, the analytical results must be combined.

i. If the average of the combined initial monitoring results for radium-226 and radium-228 is above ½ the MCL but at or below the MCL, the public water system must collect and analyze at least one sample at that sampling point every three years.

f. Public water systems must use the samples collected during the reduced monitoring period to determine the monitoring frequency for subsequent monitoring periods (e.g., if a system's sampling point is on a nine year monitoring period, and the sample result is above ½ MCL, then the next monitoring period for that sampling point is three years).

g. If a public water system has a monitoring result that exceeds the MCL while on reduced monitoring, the system must collect and analyze quarterly samples at that sampling point until the system has results from four consecutive quarters that are below the MCL, unless the system enters into another schedule as part of a formal compliance agreement with the Director.

§ 412 MONITORING AND COMPLIANCE REQUIREMENTS FOR BETA PARTICLE AND PHOTON RADIOACTIVITY

A. To determine compliance with the maximum contaminant levels in § 209 for beta particle and photon

radioactivity, a public water system must monitor at a frequency as follows:

1. CWSs (both surface and ground water) designated by the Director as vulnerable must sample for beta particle and photon radioactivity. Public water systems must collect quarterly samples for beta emitters and annual samples for tritium and strontium-90 at each entry point to the distribution system, beginning within one quarter after being notified by the Director. Public water systems already designated by the Director must continue to sample until the Director reviews and either reaffirms or removes the designation.

   a. If the gross beta particle activity minus the naturally occurring potassium-40 beta particle activity at a sampling point has a running annual average (computed quarterly) less than or equal to 50 pCi/L (screening level), the Director may reduce the frequency of monitoring at that sampling point to once every 3 years. Public water systems must collect all samples required in (A)(1) of this section during the reduced monitoring period.

   b. For systems in the vicinity of a nuclear facility, the Director may allow the CWS to utilize environmental surveillance data collected by the nuclear facility in lieu of monitoring at the system's entry point(s), where the Director determines if such data is applicable to a particular public water system. In the event that there is a release from a nuclear facility, systems which are using surveillance data must begin monitoring at the CWS's entry point(s) in accordance with (A)(1) of this section.

2. CWSs (both surface and ground water) designated by the Director as utilizing waters contaminated by effluents from nuclear facilities must sample for beta particle and photon radioactivity. Public water systems must collect quarterly samples for beta emitters and iodine-131 and annual samples for tritium and strontium-90 at each entry point to the distribution system, beginning within one quarter after being notified by the Director. Systems already designated by the Director as systems using waters contaminated by effluents from nuclear facilities must continue to sample until the Director reviews and either reaffirms or removes the designation.

   a. Quarterly monitoring for gross beta particle activity shall be based on the analysis of monthly samples or the analysis of a composite of three monthly samples. The former is recommended.

   b. For iodine-131, a composite of five consecutive daily samples shall be analyzed once each quarter. As ordered by the Director, more frequent monitoring shall be conducted when iodine-131 is identified in the finished water.

   c. Annual monitoring for strontium-90 and tritium shall be conducted by means of the analysis of a composite of four consecutive quarterly samples or analysis of four quarterly samples. The latter procedure is recommended.

   d. If the gross beta particle activity beta minus the naturally occurring potassium-40 beta particle activity at a sampling point has a running annual average (computed quarterly) less than or equal to 15 pCi/L, the Director may reduce the frequency of monitoring at that sampling point to every 3 years. Public water systems must collect all samples required in (A)(2) of this section during the reduced monitoring period.

   e. For systems in the vicinity of a nuclear facility, the Director may allow the CWS to utilize environmental surveillance data collected by the nuclear facility in lieu of monitoring at the system's entry point(s), where the Director determines if such data is applicable to a particular public water system. In the event that there is a release from a nuclear facility, systems which are using surveillance data must begin monitoring at the CWS's entry point(s) in accordance with (A)(2) of this section.

3. CWSs designated by the Director to monitor for beta particle and photon radioactivity can not apply to the Director for a waiver from the monitoring frequencies specified in (A)(1) or (A)(2) of this section.

4. CWSs may analyze for naturally occurring potassium-40 beta particle activity from the same or equivalent sample used for the gross beta particle activity analysis. Systems are allowed to subtract the potassium-40 beta particle activity value from the total gross beta particle activity value to determine if the screening level is exceeded. The potassium-40 beta

particle activity must be calculated by multiplying elemental potassium concentrations (in mg/L) by a factor of 0.82.

5. If the gross beta particle activity minus the naturally occurring potassium-40 beta particle activity exceeds the screening level, an analysis of the sample must be performed to identify the major radioactive constituents present in the sample and the appropriate doses must be calculated and summed to determine compliance with § 209 (A)(1)(#3,Note 2), using the formula in § 209 (A)(1)(#3, Note 3). Doses must also be calculated and combined for measured levels of tritium and strontium to determine compliance.
6. Public water systems must monitor monthly at the sampling point(s) which exceed the maximum contaminant level in § 209 (A)(1) beginning the month after the exceedance occurs. Public water systems must continue monthly monitoring until the system has established, by a rolling average of 3 monthly samples, that the MCL is being met. Public water systems who establish that the MCL is being met must return to quarterly monitoring until the systems meet the requirements set forth in (A)(1)(b) or (A)(2)(a) of this section.

§ 413 TURBIDITY SAMPLING AND ANALYTICAL REQUIREMENTS

The requirements in this section apply to unfiltered systems that the Director has determined, in writing pursuant to § 2535 of the NNSDWA, must install filtration, until June 29, 1993, or until filtration is installed, whichever is later.

A. Samples shall be taken by public water system owners or operators for both community and non-CWSs at a representative entry point(s) to the water distribution system at least once per day, for the purpose of making turbidity measurements to determine compliance with § 206. If the Director determines that a reduced sampling frequency in a non-CWS will not pose a risk to public health, the Director can reduce the required sampling frequency. The option of reducing the turbidity frequency shall be permitted only in those public water systems that practice disinfection and which maintain an active residual disinfectant in the distribution system, and in cases where the Director has indicated in writing that no unreasonable risk to health existed under the circumstances of this option. Turbidity measurements shall be made as directed in Appendix D § 801-D (B).

B. If the result of a turbidity analysis indicates that the maximum allowable limit has been exceeded, the sampling and measurement shall be confirmed by resampling as soon as practical and preferably within one hour. If the repeat sample confirms that the maximum allowable limit has been exceeded, the public water system owner or operator shall report to the Director within forty-eight hours. The repeat sample shall be the sample used for the purpose of calculating the monthly average. If the monthly average of the daily samples exceeds the maximum allowable limit, or if the average of two samples taken on consecutive days exceeds 5 NTU, the public water system owner or operator shall report to the Director and notify the public as required by §§ 502 and 603.

C. Sampling for non-CWSs shall begin within two years after the effective date of this part.

D. The requirements of this section shall apply only to public water systems which use water obtained in whole or in part from surface sources.

E. The Director has the authority to determine compliance or initiate enforcement action based upon analytical results or other information compiled by his/her authorized representative(s).

§ 414 ALTERNATE ANALYTICAL TECHNIQUES

With the written permission of the Director, concurred in by the Administrator of the U.S. EPA, an alternate analytical technique may be employed. An alternate technique shall be accepted only if it is substantially equivalent to the prescribed test in both precision and accuracy as it relates to the determination of compliance with an MCL. The use of the alternate analytical technique shall not decrease the frequency of monitoring required by this part.

PART VII
LEAD AND COPPER

§ 701 PURPOSE

A. These regulations apply to community water systems, and non-transient non-community water systems. Effective dates for §§ 704, 707, 708, 712 and 713 became effective on July 7, 1991, and for §§ 701, 705, 706, 709, 710, and 711 became effective on December 7, 1992.

B. These regulations establish a treatment technique that includes requirements for corrosion control treatment, source water treatment, lead service line replacement, and public education. These requirements are triggered, in some cases, by lead and copper action levels measured in samples collected at consumers' taps.

§ 702 PROHIBITION ON USE OF LEAD PIPES, SOLDER, AND FLUX

A. General Requirements

1. Prohibition. Any pipe,—solder, or flux, which is used after June 19, 1986, in the installation or repair of:

   a. Any CWS or NTNCWS, or
   b. Any plumbing in a residential or non-residential facility providing water for human consumption which is connected to a CWS or NTNCWS shall be lead free as defined in §104. This subsection shall not apply to leaded joints necessary for the repair of cast iron pipes.

Notice shall be provided notwithstanding the absence of a violation of any NNPDWR, according to § 602.

B. Navajo Nation Enforcement

1. Enforcement of prohibition. The requirements of subsection (A)(1) of this section shall be enforced in the Navajo Nation effective June 19, 1988. The Director shall enforce such requirements through local plumbing codes, or such other means of enforcement as the Director may determine to be appropriate.

C. Penalties: If the Administrator determines that the Director is not enforcing the requirements of subsection (A) of this section, as required pursuant to subsection (B), the Administrator may withhold up to 5% of Federal funds available to the PWSSP for program grants under § 1443 (a) of the Act.

§ 703 COMPLIANCE

A. Lead and copper action levels.

1. The lead action level is exceeded if the concentration of lead in more than 10 % of tap water samples collected during any sampling period conducted in accordance with § 704 is greater than 0.015 mg/L (i.e., if the "90th percentile" lead level is greater than 0.015 mg/L).

2. The copper action level is exceeded if the concentration of copper in more than 10 % of tap water samples collected during any sampling period conducted in accordance with § 704 is greater than 1.3 mg/L (i.e., if the "90th percentile" copper level is greater than 1.3 mg/L).

3. The 90th percentile lead and copper levels shall be computed as follows:

   a. The results of all lead or copper samples taken during a sampling period shall be placed in ascending order from the sample with the lowest concentration to the sample with the highest concentration. Each sampling result shall be assigned a number, ascending by single integers beginning with the number 1 for the sample with the lowest contaminant level. The number assigned to the sample with the highest contaminant level shall be equal to the total number of samples taken.

   b. The number of samples taken during the sampling period shall be multiplied by 0.9.

c. The contaminant concentration in the numbered sample yielded by the calculation in subsection (A)(3)(b) is the 90th percentile contaminant level.

d. For CWSs and NTNCWSs serving fewer than 100 people that collect 5 samples per sampling period, the 90th percentile is computed by taking the average of the highest and second highest concentrations.

e. For a public water system that has been allowed by the Director to collect fewer than five samples in accordance with § 704 (C), the sample result with the highest concentration is considered the 90th percentile value.

B. Corrosion control treatment requirements.

1. All CWSs and NTNCWSs shall install and operate optimal corrosion control treatment.

2. Any CWSs and NTNCWSs that complies with the applicable corrosion control treatment requirements specified by the Director under §§ 705 and 706 shall be deemed in compliance with the treatment requirement contained in subsection (B)(1)of this section.

C. Source water treatment requirements.

1. Any CWS or NTNCWS exceeding the lead or copper action level shall implement all applicable source water treatment requirements specified by the Director under § 709.

D. Lead service line replacement requirements.

1. Any CWS or NTNCWS exceeding the lead action level after implementation of applicable corrosion control and source water treatment requirements shall complete the lead service line replacement requirements contained in § 710.

E. Sampling and analytical requirements.

1. Tap water sampling for lead and copper, sampling for water quality parameters, source water sampling for lead and copper, and analyses of the sampling results under this part shall be completed in compliance with §§ 704, 707 and 708. The sampling methodology can be found in Appendix C-Lead and Copper.

F. Public education requirements.

1. Pursuant to § 711, all water systems must provide a consumer notice of lead tap water sampling results to persons served at the sites (taps) that are tested. Any CWS or NTNCWS ~~exceeding the lead action level shall implement the public education requirements contained in § 711~~.

G. Reporting requirements.

1. A CWS or NTNCWS shall report to the Director any information required by the treatment provisions of this part and § 712.

H. Recordkeeping requirements.

1. A CWS or NTNCWS shall maintain records in accordance with § 713.

I. Violation of NNPDWRs.

1. Failure to comply with the applicable requirements of this part shall constitute a violation of the NNPDWR for lead and/or copper.

§ 704 SAMPLING REQUIREMENTS FOR LEAD AND COPPER IN TAP WATER

A. Sample site location.

1. By the applicable date for commencement of sampling under subsection (D)(1) and (D)(2) of this section, each CWS or NTNCWS shall complete a materials evaluation of its distribution system in order to identify a pool of targeted sampling sites that meets the requirements

of this section, and which is sufficiently large enough to ensure that the CWS or NTNCWS can collect the number of lead and copper tap samples required in subsection (C) of this section. All sites from which the first draw samples are collected shall be selected from this pool of targeted sampling sites. Sampling sites may not include faucets that have point-of-use or point-of-entry treatment devices designed to remove inorganic contaminants.

2. A CWS or NTNCWS shall use the information on lead, copper, and galvanized steel that it is required to collect under § Appendix C (702-C) of these regulations (special sampling for corrosivity characteristics) when conducting a materials evaluation. When an evaluation of the information collected pursuant to § Appendix C (702-C) is insufficient to locate the requisite number of lead and copper sampling sites that meet the targeting criteria in subsection (A) of this section, the CWS or NTNCWS shall review the sources of information listed below in order to identify a sufficient number of sampling sites. In addition, the CWS or NTNCWS shall seek to collect such information where possible in the course of its normal operations (e.g., checking service line materials when reading water meters or performing maintenance activities):

   a. All plumbing codes, permits, and records in the files of the building department(s) which indicate the plumbing materials that are installed within publicly and privately owned structures connected to the distribution system;

   b. All inspections and records of the distribution system that indicate the material composition of the service connections that connect a structure to the distribution system; and

   c. All existing water quality information, which includes the results of all prior analyses of the CWS or NTNCWS or individual structures connected to the CWS or NTNCWS, indicating locations that may be particularly susceptible to high lead or copper concentrations.

3. The sampling sites selected for a CWS's sampling pool ("tier 1 sampling sites") shall consist of single family structures that:

   a. Contain copper pipes with lead solder installed after 1982 or contain lead pipes; and/or

   b. Are served by a lead service line. When multiple-family residences comprise at least 20 % of the structures served by a CWS or NTNCWS, the system may include these types of structures in its sampling pool.

4. Any CWS with insufficient tier 1 sampling sites shall complete its sampling pool with "tier 2 sampling sites" consisting of buildings, including multiple-family residences that:

   a. Contain copper pipes with lead solder installed after 1982 or contain lead pipes; and/or

   b. Are served by a lead service line.

5. Any CWS with insufficient tier 1 and tier 2 sampling sites shall complete its sampling pool with "tier 3 sampling sites" consisting of single family structures that contain copper pipes with lead solder installed before 1983. A CWS with insufficient tier 1, tier 2, and tier 3 sampling sites shall complete its sampling pool with representative sites throughout the distribution system. For the purpose of this subsection, a representative site is a site in which the plumbing materials used at that site would be commonly found at other sites served by the water system.

6. The sampling sites selected for a NTNCWS ("tier 1 sampling sites") shall consist of buildings that:

   a. Contain copper pipes with lead solder installed after 1982 or contain lead pipes; and/or

   b. Are served by a lead service line.

7. A NTNCWS with insufficient tier 1 sites that meet the targeting criteria in subsection (A)(6) of this section shall complete its sampling pool with sampling sites that contain copper pipes with lead solder installed before 1983. If additional sites are needed to complete the sampling pool, the NTNCWS shall use representative sites throughout the distribution

system. For the purpose of this subsection, a representative site is a site in which the plumbing materials used at that site would be commonly found at other sites served by the water system.

8. Any CWS or NTNCWS whose distribution system contains lead service lines shall draw 50 % of the samples it collects during each sampling period from sites that contain lead pipes, or copper pipes with lead solder, and 50 % of those samples from sites served by a lead service line. A CWS or NTNCWS that cannot identify a sufficient number of sampling sites served by a lead service line shall collect first draw samples from all of the sites identified as being served by such lines.

B. Sample collection methods.

1. All tap samples for lead and copper collected in accordance with this part, with the exception of lead service line samples collected under § 710 (C), and samples collected under subsection (B)(5) of this section, shall be first draw samples.

2. Each first-draw tap sample for lead and copper shall be one liter in volume and shall have stood motionless in the plumbing system of each sampling site for at least six hours. First-draw samples from residential housing shall be collected from the cold-water kitchen tap or bathroom sink tap. First-draw samples from a non-residential building shall be collected at an interior tap from which water is typically drawn for consumption.

Non-first-draw samples collected in lieu of first-draw samples pursuant to subsection (B)(5) of this section shall be one liter in volume and shall be collected at an interior tap from which water is typically drawn for consumption. First-draw samples may be collected by the CWS or NTNCWS owner/operator or the owner/operator may allow residents to collect first draw samples after instructing the residents of the sampling procedures specified in this subsection. To avoid problems of residents handling nitric acid, acidification of first draw samples may be done up to 14 days after the sample is collected. After acidification to resolubilize the metals, the sample must stand in the original container for the time specified in the approved EPA method before the sample can be analyzed. If a CWS or NTNCWS owner/operator allows residents to perform sampling, the owner/operator may not challenge, based on alleged errors in sample collection, the accuracy of sampling results.

3. Each service line sample shall be one liter in volume and have stood motionless in the lead service line for at least six hours. Lead service line samples shall be collected in one of the following three ways:

a. At the tap after flushing the volume of water between the tap and the lead service line. The volume of water shall be calculated based on the interior diameter and length of the pipe between the tap and the lead service line;

b. Tapping directly into the lead service line; or

c. If the sampling site is a building constructed as a single-family residence, allowing the water to run until there is a significant change in temperature which would be indicative of water that has been standing in the lead service line.

4. A CWS or NTNCWS owner/operator shall collect each first draw tap sample from the same sampling site from which it collected a previous sample. If, for any reason, the CWS or NTNCWS owner/operator cannot gain entry to a sampling site in order to collect a follow-up tap sample, the CWS or NTNCWS owner/operator may collect the follow-up tap sample from another sampling site in its sampling pool as long as the new site meets the same targeting criteria, and is within reasonable proximity of the original site.

5. A NTNCWS, or a CWS that meets the criteria of § 711 ~~(C)(7)(a) and (b)~~ (B)(7), that does not have enough taps that can supply first-draw samples, as defined in § 104, may apply to the Director in writing to substitute non-first-draw samples. Such water systems must collect as many first-draw samples from appropriate taps as possible and identify sampling times and locations that would likely result in the longest standing time for the remaining sites. The Director has the discretion to waive the requirement for prior Director-approval of non-first-draw sample sites selected by the water system, either through these regulations or written notification to the water system.

C. Number of samples. CWS or NTNCWS owner/operator shall collect at least one sample during each sampling period specified in subsection (D) of this section from the number of sites listed in

the first column below ("~~s~~Standard ~~s~~Sampling"). A CWS or NTNCWS conducting reduced sampling under subsection (D)(4) of this section shall collect at least one sample from the number of sites specified in the second column ("~~r~~Reduced ~~monitoring~~Sampling") below during each sampling period specified in subsection (D)(4) of this section. Such reduced ~~monitoring~~sampling sites shall be representative of the sites required for standard ~~monitoring~~sampling. A public water system that has fewer than five drinking water taps, that can be used for human consumption meeting the sample site criteria of subsection (A) of this section to reach the required number of sample sites listed in subsection (C) of this section, must collect at least one sample from each tap and then must collect additional samples from those taps on different days during the sampling period to meet the required number of sites. Alternatively, the Director may allow those public water systems to collect a number of samples less than the number of sites specified in subsection (C) of this section, provided that 100 percent of all taps that can be used for human consumption are sampled. The Director must approve this reduction of the minimum number of samples in writing based on a request from the system or onsite verification by the Director. The Director may specify sampling locations when a water system is conducting reduced ~~monitoring~~sampling. The table is as follows:

TABLE 700.1 SAMPLING SIZE

System Size (# people served)	# of Sites (Standard Sampling)	# of Sites (Reduced Sampling)
>100,000	100	50
10,001 - 100,000	60	30
3,301 - 10,000	40	20
501 - 3,300	20	10
101 - 500	10	5
≤ 100	5	5

D. SAMPLING REQUIREMENTS

1. All large CWSs or NTNCWSs shall sample during two consecutive six-month periods.

2. All small and medium-size CWSs or NTNCWSs shall sample during each six-month sampling period until:

   a. The CWS or NTNCWS exceeds the lead or copper action level and is therefore required to implement the corrosion control treatment requirements under § 706, in which case the water system shall continue sampling in accordance with subsection (D)(3) of this section, or

   b. The CWS or NTNCWS meets the lead or copper action levels during two consecutive six-month sampling periods, in which case the water system may reduce sampling in accordance with subsection (D)(5) of this section.

3. Sampling after installation of corrosion control and source water treatment.

   a. Any large CWS or NTNCWS which installs optimal corrosion control treatment pursuant to § 706 (D)(4) shall sample during two consecutive six-month sampling periods by the date specified in § 706 (D)(5).

   b. Any small or medium-size CWS or NTNCWS which installs optimal corrosion control treatment pursuant to §706(E)(5) shall sample during two consecutive six-month sampling periods by the date specified in § 706(E)(6).

c. Any CWS or NTNCWS which installs source water treatment pursuant to § 709 (A)(3) shall sample during two consecutive six-month sampling periods by the date specified in § 709(A)(4).

4. Sampling after the Director specifies water quality parameter values for optimal corrosion control.

After the Director specifies the value for water quality control parameters under § 705(F), the CWS or NTNCWS shall sample during each subsequent six-month sampling period, with the first sampling period to begin on the date the Director specifies the optimal values under § 705(F).

5. Reduced sampling:

a. A small or medium-size CWS or NTNCWS that meets the lead and copper action levels during each of two consecutive six-month sampling periods may reduce the number of samples in accordance with subsection (C) of this section, and reduce the frequency of sampling to once per year. A small or medium water system collecting fewer than five samples as specified in subsection (C) of this section, that meets the lead and copper action levels during each of two consecutive six-month sampling periods may reduce the frequency of sampling to once per year. In no case can the system reduce the number of samples required below the minimum of one sample per available tap. This sampling shall begin during the calendar year immediately following the end of the second consecutive six-month sampling period.

b. ~~Any CWS or NTNCWS that maintains the range of values for the water quality control parameters reflecting optimal corrosion control treatment specified by the Director under § 705 (F) during each of two consecutive six-month sampling periods may reduce the frequency of monitoring to once per year and reduce the number of lead and copper samples in accordance with subsection (C) of this section if it receives written approval from the Director. The Director shall review monitoring, treatment and other relevant information submitted by the CWS or NTNCWS in accordance with § 712, and shall notify the water system in writing when it determines the water system is eligible to commence reduced monitoring pursuant to this subsection. The Director shall review, and where appropriate, revise the determination when the CWS or NTNCWS submits new sampling or treatment data, or when other data relevant to the number and frequency of tap sampling becomes available.~~ Any water system that meets the lead action level and maintains the range of values for the water quality control parameters reflecting optimal corrosion control treatment specified by the Director under § 705(F) during each of two consecutive six-month sampling periods may reduce the frequency of sampling to once per year and reduce the number of lead and copper samples in accordance with subsection (C) of this section if it receives written approval from the Director. This sampling shall begin during the calendar year immediately following the end of the second consecutive six-month sampling period. The Director shall review sampling, treatment, and other relevant information submitted by the water system in accordance with § 712, and shall notify the system in writing when it determines the system is eligible to commence reduced sampling pursuant to this subsection. The Director shall review, and where appropriate, revise its determination when the system submits new sampling or treatment data, or when other data relevant to the number and frequency of tap sampling becomes available.

c. A small or medium-size CWS or NTNCWS that meets the lead and copper action levels during three consecutive years of sampling may reduce the frequency of sampling for lead and copper from annually to once every three years. Any ~~CWS or NTNCWS~~ water system that meets the lead action level and maintains the range of values for the water quality control parameters reflecting optimal corrosion control treatment specified by the Director under § 705(F) during three consecutive years of sampling

may ~~request that the Director allow the CWS or NTNCWS to~~ reduce the frequency of sampling from annually to once every three years if it receives written approval from the Director. The Director shall review ~~monitoring~~sampling, treatment, and other relevant information submitted by the CWS or NTNCWS in accordance with § 712, and shall notify the water system in writing when it determines the water system is eligible to reduce the frequency of ~~monitoring~~sampling to once every three years. The Director shall review, and where appropriate, revise the determination when the water system submits new sampling or treatment data, or when other data relevant to the number and frequency of tap sampling becomes available.

d. A CWS or NTNCWS that reduces the number and frequency of sampling shall collect these samples from representative sites included in the pool of targeted sampling sites identified in subsection (A) of this section. A CWS or NTNCWS sampling annually or less frequently shall conduct the lead and copper tap sampling during the months of June, July, August or September unless the Director has approved a different sampling period in accordance with subsection (D)(5)(d)(i) of this section.

i. The Director, at his/her discretion, may approve a different period for conducting the lead and copper tap sampling for water systems collecting a reduced number of samples. Such a period shall be no longer than four consecutive months and must represent a time of normal operation where the highest levels of lead are most likely to occur. For a NTNCWS that does not operate during the months of June through September, and for which the period of normal operation where the highest levels of lead are most likely to occur is not known, the Director shall designate a period that represents a time of normal operation for the water system. This sampling shall begin during the period approved or designated by the Director in the calendar year immediately following the end of the second consecutive six-month sampling period for systems initiating annual sampling and during the three-year period following the end of the third consecutive calendar year of annual sampling for systems initiating triennial sampling.

ii. CWSs or NTNCWSs ~~monitoring~~sampling annually, that have been collecting samples during the months of June through September and that receive Director approval to alter their sample collection period under subsection (D) (5) (d) (i) of this section, must collect their next round of samples during a time period that ends no later than 21 months after the previous round of sampling.

CWSs or NTNCWSs ~~monitoring~~sampling triennially that have been collecting samples during the months of June through September, and receive Director approval to alter the sampling collection period as per subsection (D) (5) (d) (i) of this section, must collect their next round of samples during a time period that ends no later than 45 months after the previous round of sampling. Subsequent rounds of sampling must be collected annually or triennially, as required by this section. Small CWSs or NTNCWSs with waivers, granted pursuant to subsection (G) of this section, that have been collecting samples during the months of June through September and receive Director approval to alter their sample collection period under subsection (D)(5)(d)(i) of this section must collect their next round of samples before the end of the 9-year period.

e. Any CWS or NTNCWS that demonstrates for two consecutive 6-month ~~monitoring~~sampling periods that the tap water lead level computed under § 703 (A) (3) is less than or equal to 0.005 mg/L and the tap water copper level computed under § 703(A) (3) (a) is less than or equal to 0.65 mg/L may reduce the number of samples in accordance with subsection (C) of this section and reduce the frequency of sampling to once every three calendar years.

f. A small or medium-size CWS or NTNCWS subject to reduced sampling that exceeds the lead or copper action level shall resume sampling in accordance with subsection (D)(4) of this section and collect the number of samples specified for standard sampling under subsection (C) of this section. Such CWS or NTNCWS shall also conduct water quality parameter sampling in accordance with § 707(B), (C) or (D) (as appropriate) during the sampling period in which it exceeded that action level. Any

CWS or NTNCWS may resume annual ~~monitoring~~sampling for lead and copper at the tap at the reduced number of sites specified in subsection (C) of this section after it has completed two subsequent consecutive six-month rounds of ~~monitoring~~sampling that meet the criteria of subsection (D)(5)(a) of this section and/or may resume triennial ~~monitoring~~sampling for lead and copper at the reduced number of sites after it demonstrates through subsequent rounds of ~~monitoring~~sampling that it meets the criteria of either subsection (D)(5)(c) or (D)(5)(e) of this section.

i. Any CWS or NTNCWS subject to the reduced ~~monitoring~~sampling frequency that fails to meet the lead action level during any four-month sampling period or that fails to operate at or above the minimum value or within the range of values for the water quality parameters specified by the Director under § 705(F) for more than nine days in any six-month period specified in § 707(D) shall conduct tap water sampling for lead and copper at the frequency specified in subsection (D)(4) of this section, collect the number of samples specified for standard ~~monitoring~~sampling under subsection (C) of this section, and shall resume ~~monitoring~~sampling for water quality parameters within the distribution system in accordance with § 707 (D). This standard tap water sampling shall begin no later than the six-month period beginning January 1st of the calendar year following the lead action level exceedance or water quality parameter excursion. Such a water system may resume reduced ~~monitoring~~sampling for lead and copper at the tap and for water quality parameters within the distribution system under the following conditions:

1. The CWS or NTNCWS may resume annual ~~monitoring~~sampling for lead and copper at the tap at the reduced number of sites specified in subsection (C) of this section after it has completed two subsequent six-month rounds of ~~monitoring~~sampling that meet the criteria of subsection (D)(5)(b) of this section and the water system has received written approval from the Director that it is appropriate to resume reduced ~~monitoring~~sampling on an annual frequency. This sampling shall begin during the calendar year immediately following the end of the second consecutive six-month sampling period.

2. The CWS or NTNCWS may resume triennial ~~monitoring~~sampling for lead and copper at the tap at the reduced number of sites after it demonstrates through subsequent rounds of ~~monitorings~~sampling that it meets the criteria of either subsection (D)(5)(c) or (D)(5)(e) of this section and the water system has received written approval from the Director that it is appropriate to resume triennial ~~monitoring~~sampling.

3. The CWS or NTNCWS may reduce the number of water quality parameter tap water samples required in accordance with § 707(E)(1) and the frequency with which it collects such samples in accordance with § 707(E)(2). Such a CWS or NTNCWS may not resume triennial ~~monitoring~~sampling for water quality parameters at the tap until it demonstrates, in accordance with the requirements of § 707(E)(2), that it has re-qualified for triennial ~~monitoring~~sampling.

g. Any CWS or NTNCWS subject to a reduced ~~monitoring~~sampling frequency under subsection (D)(5) of this section that either adds a new source of water or changes any water treatment shall inform the Director in writing in accordance with § 712(A)(3). The Director may require the CWS or NTNCWS to resume sampling in accordance with subsection (D)(4) of this section and collect the number of samples specified for standard ~~monitoring~~sampling under subsection (C) of this section or take other appropriate steps such as increased water quality parameter ~~monitoring~~sampling or

re-evaluation of its corrosion control treatment given the potentially different water quality considerations.

E. Additional sampling by CWSs or NTNCWSs. The results of any sampling conducted in addition to the minimum requirements of this section shall be considered by the CWS or NTNCWS and the Director in making any determinations (i.e., calculating the 90th percentile lead or copper level) under this section.

F. Invalidation of lead or copper tap water samples.

A sample invalidated under this subsection does not count toward determining lead or copper 90th percentile levels under § 703(A)(3) or toward meeting the minimum ~~monitoring~~sampling requirements of subsection (C) of this section.

1. The Director may invalidate a lead or copper tap water sample at least if one of the following conditions is met.

   a. The laboratory establishes that improper sample analysis caused erroneous results.

   b. The Director determines that the sample was taken from a site that did not meet the site selection criteria of this section.

   c. The sample container was damaged in transit.

   d. There is substantial reason to believe that the sample was subject to tampering.

2. The CWS or NTNCWS must report the results of all samples to the Director and all supporting documentation for samples the water system believes should be invalidated.

3. To invalidate a sample under subsection (F) (1) of this section, the decision and the rationale for the decision must be documented in writing. The Director may not invalidate a sample solely on the grounds that a follow-up sample result is higher or lower than that of the original sample.

4. The CWS or NTNCWS must collect replacement samples for any samples invalidated under this section if, after the invalidation of one or more samples, the water system has too few samples to meet the minimum requirements of subsection (C) of this section. Any such replacement samples must be taken as soon as possible, but no later than 20 days after the date the Director invalidates the sample or by the end of the applicable ~~monitoring~~sampling period, whichever occurs later. Replacement samples taken after the end of the applicable ~~monitoring~~sampling period shall not also be used to meet the ~~monitoring~~sampling requirements of a subsequent ~~monitoring~~sampling period. The replacement samples shall be taken at the same locations as the invalidated samples or, if that is not possible, at locations other than those already used for sampling during the ~~monitoring~~sampling period.

G. ~~Monitoring~~Sampling waivers for small CWSs or NTNCWSs.

Any small CWS or NTNCWS that meets the criteria of this subsection may apply to the Director to reduce the frequency of ~~monitoring~~sampling for lead and copper under this section to once every nine years (i.e., a "full waiver") if it meets all of the materials criteria specified in subsection (G) (1) of this section and all of the ~~monitoring~~sampling criteria specified in subsection (G) (2) of this section. If these regulations permit, any small CWS or NTNCWS that meets the criteria in subsections (G)(1) and (2) of this section only for lead, or only for copper, may apply to the Director for a waiver to reduce the frequency of tap water ~~monitoring~~sampling to once every nine years for that contaminant only (i.e., a "partial waiver").

1. Materials criteria.

   The CWS or NTNCWS must demonstrate that its distribution system and service lines and all drinking water supply plumbing, including plumbing conveying drinking water within all residences and buildings connected to the water system, are free of lead-containing materials and/or copper-containing materials, as those terms are defined in this subsection, as follows:

a. Lead.

To qualify for a full waiver, or a waiver of the tap water ~~monitoring~~sampling requirements for lead (i.e., a "lead waiver"), the water system must provide certification and supporting documentation to the Director that the water system is free of all lead-containing materials, as follows:

i. It contains no plastic pipes which contain lead plasticizers, or plastic service lines which contain lead plasticizers; and

ii. It is free of lead service lines, lead pipes, lead soldered pipe joints, and leaded brass or bronze alloy fittings and fixtures, unless such fittings and fixtures meet the specifications of any standard established pursuant to §2521 of the NNSDWA.

b. Copper.

To qualify for a full waiver, or a waiver of the tap water ~~monitoring~~sampling requirements for copper (i.e., a "copper waiver"), the water system must provide certification and supporting documentation to the Director that the water system contains no copper pipes or copper service lines.

2. ~~Monitoring~~Sampling criteria for waiver issuance.

The CWS or NTNCWS must have completed at least one 6-month round of standard tap water ~~monitoring~~sampling for lead and copper at sites approved by the Director and from the number of sites required by subsection (C) of this section and demonstrate that the 90th percentile levels for any and all rounds of ~~monitoring~~sampling conducted since the water system became free of all lead-containing and/or copper-containing materials, as appropriate, meet the following criteria.

a. Lead levels. To qualify for a full waiver, or a lead waiver, the CWS or NTNCWS must demonstrate that the 90th percentile lead level does not exceed 0.005 mg/L.

b. Copper levels. To qualify for a full waiver, or a copper waiver, the CWS or NTNCWS must demonstrate that the 90th percentile copper level does not exceed 0.65 mg/L.

3. Director approval of waiver application.

The Director shall notify the CWS or NTNCWS of its waiver determination, in writing, setting forth the basis of the decision and any condition of the waiver. As a condition of the waiver, the Director may require the water system to perform specific activities (e.g., limited ~~monitoring~~sampling, periodic outreach to customers to remind them to avoid installation of materials that might void the waiver) to avoid the risk of lead or copper concentration of concern in tap water. The small CWS or NTNCWS must continue ~~monitoring~~sampling for lead and copper at the tap as required by subsections (D)(1) through (D)(4) of this section, as appropriate, until it receives written notification from the Director that the waiver has been approved.

4. ~~Monitoring~~Sampling frequency for CWSs or NTNCWSs with waivers.

a. A CWS or NTNCWS with a full waiver must conduct tap water ~~monitoring~~sampling for lead and copper in accordance with subsection (D) (5) (d) of this section at the reduced number of sampling sites identified in subsection (C) of this section at least once every nine years and provide the materials certification specified in subsection (G) (1) of this section for both lead and copper to the Director along with the ~~monitoring~~sampling results. Samples collected every nine years shall be collected no later than every ninth calendar year.

b. A CWS or NTNCWS with a partial waiver must conduct tap water ~~monitoring~~sampling for the waived contaminant in accordance with subsection (D) (5) (d) of this section at the reduced number of sampling sites specified in subsection (C) of this section at least once every nine years and provide the materials certification specified

in subsection (G) (1) of this section pertaining to the waived contaminant along with the ~~monitoring~~sampling results. Such a water system also must continue to monitor for the non-waived contaminant in accordance with requirements of subsections (D) (1) through (D) (5) of this section, as appropriate.

c. ~~If a CWS or NTNCWS with a full or partial waiver adds a new source of water or changes any water treatment, the water system must notify the Director in writing within sixty days of the change in accordance with § 712(A)(3).~~ Any water system with a full or partial waiver shall notify the Director in writing in accordance with § 712(A)(3) of any upcoming long-term change in treatment or addition of a new source, as described in that section. The Director must review and approve the addition of a new source or long-term change in water treatment before it is implemented by the water system. The Director has the authority to require the water system to add or modify waiver conditions (e.g., require re-certification that the water system is free of lead-containing and/or copper-containing materials, require additional round(s) of ~~monitoring~~sampling), if it deems such modifications are necessary to address treatment or source water changes at the water system.

d. If a CWS or NTNCWS with a full or partial waiver becomes aware that it is no longer free of lead-containing or copper-containing materials, as appropriate, (e.g., as a result of new construction or repairs), the water system shall notify the Director in writing no later than 60 days after becoming aware of such a change.

5. Continued eligibility.

If the CWS or NTNCWS continues to satisfy the requirements of subsection (G) (4) of this section, the waiver will be renewed automatically, unless any of the conditions listed in subsections (G) (5) (a) through (G) (5) (c) of this section occurs. A water system whose waiver has been revoked may re-apply for a waiver at such time as it again meets the appropriate materials and ~~monitoring~~sampling criteria of subsections (G)(1) and (G)(2) of this section.

a. A CWS or NTNCWS with a full waiver or a lead waiver no longer satisfies the materials criteria of subsection (G) (1) (a) of this section or has a 90th percentile lead level greater than 0.005 mg/L.

b. A CWS or NTNCWS with a full waiver or a copper waiver no longer satisfies the materials criteria of subsection (G)(1)(b) of this section or has a 90th percentile copper level greater than 0.65 mg/L.

c. The Director notifies the CWS or NTNCWS, in writing, that the waiver has been revoked, setting forth the basis of the decision.

6. Requirements following waiver revocation.

A CWS or NTNCWS whose full or partial waiver has been revoked by the Director is subject to the corrosion control treatment and lead and copper tap water ~~monitoring~~sampling requirements, as follows:

a. If the CWS or NTNCWS exceeds the lead and/or copper action level, the water system must implement corrosion control treatment in accordance with the deadlines specified in § 706(E), and any other applicable requirements of this part.

b. If the CWS or NTNCWS meets both the lead and the copper action level, the water system must monitor for lead and copper at the tap no less frequently than once every three years using the reduced number of sample sites specified in subsection (C) of this section.

7. Pre-existing waivers.

Small CWS or NTNCWS waivers approved by the Director in writing prior to the promulgation of these regulations shall remain in effect under the following conditions:

a. If the CWS or NTNCWS has demonstrated that it is both free of lead-containing and copper-containing materials, as required by subsection (G) (1) of this section and that its 90th percentile lead levels and 90th percentile copper levels meet the criteria of subsection (G) (2) of this section, the waiver remains in effect so long as the water system continues to meet the waiver eligibility criteria of subsection (G) (5) of this section. The first round of tap water ~~monitoring~~sampling conducted pursuant to subsection (G)(4) of this section shall be completed no later than nine years after the last time the water system has ~~monitored~~sampled for lead and copper at the tap.

b. If the CWS or NTNCWS has met the materials criteria of subsection (G) (1) of this section but has not met the ~~monitoring~~sampling criteria of subsection (G) (2) of this section, the water system shall conduct a round of ~~monitoring~~sampling for lead and copper at the tap demonstrating that it meets the criteria of subsection (G) (2) of this section no later than September 30, 2000. Thereafter, the waiver shall remain in effect as long as the water system meets the continued eligibility criteria of subsection (G) (5) of this section. The first round of tap water ~~monitoring~~sampling conducted pursuant to subsection (G)(4) of this section shall be completed no later than nine years after the round of ~~monitoring~~sampling conducted pursuant to subsection (G)(2) of this section.

§ 705 DESCRIPTION OF CORROSION CONTROL TREATMENT REQUIREMENTS

Each CWS or NTNCWS shall complete the corrosion control treatment requirements described below which are applicable to such CWS or NTNCWS under § 706.

A. CWS or NTNCWS recommendation regarding corrosion control treatment.

1. Based upon the results of lead and copper tap sampling and water quality parameter sampling, small and medium-size CWS or NTNCWS exceeding the lead or copper action level shall recommend installation of one or more of the corrosion control treatments listed in subsection (C) (1) of this section which the CWS or NTNCWS believes constitutes optimal corrosion control for that CWS or NTNCWS.

2. The Director may require the CWS or NTNCWS to conduct additional water quality parameter sampling in accordance with § 707(B) to assist the Director in reviewing the CWS's or NTNCWS's recommendation.

B. Director-decision to require studies of corrosion control treatment (applicable to small and medium-size CWSs or NTNCWSs).

1. The Director may require any small and medium-size CWS or NTNCWS that exceeds the lead or copper action level to perform corrosion control studies under subsection (C) of this section to identify optimal corrosion control treatment for the CWS or NTNCWS.

C. Performance of corrosion control studies.

1. Any CWS or NTNCWS performing corrosion control studies shall evaluate the effectiveness of each of the following treatments, and, if appropriate, combinations of the following treatments to identify the optimal corrosion control treatment for that CWS or NTNCWS:

a. Alkalinity and pH adjustment;

b. Calcium hardness adjustment; and

c. The addition of a phosphate or silicate based corrosion inhibitor at a concentration sufficient to maintain an effective residual concentration in all test tap samples.

2. The CWS or NTNCWS shall evaluate each of the corrosion control treatments using either pipe rig/loop tests, metal coupon tests, partial- system tests, or analyses based on documented analogous treatments with other CWSs or NTNCWSs of similar size, water chemistry and distribution system configuration.

3. The CWS or NTNCWS shall measure the following water quality parameters in any tests conducted under this subsection before and after evaluating the corrosion control treatments listed above:

a. Lead;
b. Copper;
c. pH;
d. Alkalinity;
e. Calcium;
f. Conductivity;
g. Orthophosphate (when an inhibitor containing a phosphate compound is used);
h. Silicate (when an inhibitor containing a silicate compound is used); and
i. Water temperature.

4. The CWS or NTNCWS shall identify all chemical or physical constraints that limit or prohibit the use of a particular corrosion control treatment and document such constraints with at least one of the following:

a. Data and documentation showing that a particular corrosion control treatment has adversely affected other water treatment processes when used by another CWS or NTNCWS with comparable water quality characteristics; and/or

b. Data and documentation demonstrating that the CWS or NTNCWS has previously attempted to evaluate a particular corrosion control treatment and has found that the treatment is ineffective or adversely affects other water quality treatment processes.

5. The CWS or NTNCWS shall evaluate the effect of the chemicals used for corrosion control treatment on other water quality treatment processes.

6. On the basis of an analysis of the data generated during each evaluation, the CWS or NTNCWS shall recommend to the Director in writing the treatment option that the corrosion control studies indicate constitutes optimal corrosion control treatment for that CWS or NTNCWS. The CWS or NTNCWS shall provide a rationale for its recommendation along with all supporting documentation specified in subsections (C) (1) through (5) of this section.

D. Director's designation of optimal corrosion control treatment.

1. Based upon consideration of available information including, where applicable, studies performed under subsection (C) of this section and a CWS's or NTNCWS's recommended treatment alternative, the Director shall either approve the corrosion control treatment option recommended by the CWS or NTNCWS or designate alternative corrosion control treatment(s) from among those listed in subsection (C) (1) of this section. When designating optimal treatment, the Director shall consider the effects that additional corrosion control treatment will have on water quality parameters and on other water quality treatment processes.

2. The Director shall notify the CWS or NTNCWS of the decision on optimal corrosion control treatment in writing and explain the basis for this determination. If the Director requests additional information to aid the review, the CWS or NTNCWS shall provide the information.

E. Installation of optimal corrosion control. Each CWS or NTNCWS shall properly install and operate throughout its distribution system the optimal corrosion control treatment designated by the Director under subsection (D) of this section.

F. Director's review of treatment and specification of optimal water quality control parameters. The Director shall evaluate the results of all lead and copper tap samples and water quality parameter samples submitted by the CWS or NTNCWS and determine whether the CWS or NTNCWS has properly installed and operated the optimal corrosion control treatment designated by the Director in subsection (D) of this section. Upon reviewing the results of tap water and water quality parameter sampling by the CWS or NTNCWS, both before and after the CWS or NTNCWS installs optimal corrosion control treatment, the Director shall designate:

1. A minimum value or a range of values for pH measured at each entry point to the distribution system;

2. A minimum pH value, measured in all tap samples. Such value shall be equal to or greater than 7.0, unless the Director determines that meeting a pH level of 7.0 is not technologically feasible or is not necessary for the CWS or NTNCWS to optimize corrosion control;

3. If a corrosion inhibitor is used, a minimum concentration or a range of concentrations for the inhibitor, measured at each entry point to the distribution system and in all tap samples, that the Director determines is necessary to form a passivating film on the interior walls of the pipes of the distribution system;

4. If alkalinity is adjusted as part of optimal corrosion control treatment, a minimum concentration or a range of concentrations for alkalinity, measured at each entry point to the distribution system and in all tap samples;

5. If calcium carbonate stabilization is used as part of corrosion control, a minimum concentration or a range of concentrations for calcium, measured in all tap samples.

The values for the applicable water quality control parameters listed above shall be those that the Director determines to reflect optimal corrosion control treatment for the CWS or NTNCWS. The Director may designate values for additional water quality control parameters to reflect optimal corrosion control for the CWS or NTNCWS. The Director shall notify the CWS or NTNCWS in writing of the determinations and explain the basis for the decisions.

G. Continued Operation and Sampling. All CWSs or NTNCWSs optimizing corrosion control shall continue to operate and maintain optimal corrosion control treatment, including maintaining water quality parameters at or above minimum values or within ranges designated by the Director under subsection (F) of this section, in accordance with this subsection for all samples collected under § 707(D)-(F). Compliance with the requirements of this subsection shall be determined every six months, as specified under § 707(D). A water system is out of compliance with the requirements of this subsection for a six-month period if it has excursions for any NNEPA-specified parameter on more than nine days during the period. An excursion occurs whenever the daily value for one or more of the water quality parameters measured at a sampling location is below the minimum value or outside the range designated by the Director. Daily values are calculated as follows. The Director will have discretion to delete results of obvious sampling errors from this calculation.

1. On days when more than one measurement for the water quality parameter is collected at the sampling location, the daily value shall be the average of all results collected during the day regardless of whether they are collected through continuous ~~monitoring~~sampling, grab sampling, or a combination of both. If EPA has approved an alternative formula under 40 CFR §142.16 in the state/tribe's application for a program revision submitted pursuant to 40 CFR §142.12, the state/tribe's formula shall be used to aggregate multiple measurements taken at a sampling point for the water quality parameter in lieu of the formula in this subsection.

2. On days when only one measurement for the water quality parameter is collected at the sampling location, the daily value shall be the result of that measurement.

3. On days when no measurement is collected for the water quality parameter at the sampling location, the daily value shall be the daily value calculated on the most recent day on which the water quality parameter was measured at the sample site.

H. Modification of the Director's treatment decision.

Upon the Director's initiative or in response to a request by a CWS or NTNCWS or other interested party, the Director may modify a determination of the optimal corrosion control treatment under subsection (D) of this section or optimal water quality control parameters under subsection (F) of this section.

A request for modification by a CWS or NTNCWS or other interested party shall be in writing, explain why the modification is appropriate, and provide supporting documentation.

The Director may modify a determination where the Director concludes that such change is necessary to ensure that the CWS or NTNCWS continues to optimize corrosion control treatment.

A revised determination shall be made in writing, set forth the new treatment requirements, explain the basis for the Director's decision, and provide an implementation schedule for completing the treatment modifications.

I. Treatment decisions by EPA in lieu of the Director.

Pursuant to the procedures in 40 CFR § 142.19, the EPA Regional Administrator may review treatment determinations made by the Director under subsections (D), (F), or (H) of this section and issue federal treatment determinations consistent with the requirements of those subsections where the Regional Administrator finds that:

1. The Director has failed to issue a treatment determination by the applicable deadlines contained in § 706;

2. The Director has abused his/her discretion in a substantial number of cases or in cases affecting a substantial population; or

3. The technical aspects of the Director's determination would be indefensible in an expected Federal enforcement action taken against a CWS or NTNCWS.

§ 706 APPLICABILITY OF CORROSION CONTROL TREATMENT STEPS TO SMALL, MEDIUM-SIZE AND LARGE PUBLIC WATER SYSTEM

A. Public water system, CWSs and NTNCWSs, shall complete the applicable corrosion control treatment requirements described in § 705 by the deadlines established in this section.

1. A large CWS or NTNCWS (serving >50,000 persons) shall complete the corrosion control treatment steps specified in subsection (D) of this section, unless it is deemed to have optimized corrosion control under subsection (B) (2) or (B) (3) of this section.

2. A small CWS or NTNCWS (serving ≤3,300 persons) and medium-size CWS or NTNCWS (serving >3,300 and ≤50,000 persons) shall complete the corrosion control treatment steps specified in subsection (E) of this section, unless it is deemed to have optimized corrosion control under subsection (B)(1), (B)(2), or (B)(3) of this section.

B. Any CWS or NTNCWS deemed to have optimized corrosion control under this section, and which has treatment in place, shall continue to operate and maintain optimal corrosion control treatment and meet any requirements that the Director determines appropriate to ensure optimal corrosion control treatment is maintained.

A CWS or NTNCWS is deemed to have optimized corrosion control and is not required to complete the applicable corrosion control treatment steps identified in this section if the CWS or NTNCWS satisfies one of the following criteria:

1. A small or medium-size CWS or NTNCWS is deemed to have optimized corrosion control if the CWS or NTNCWS meets the lead and copper action levels during each of two consecutive six-month sampling periods conducted in accordance with § 704.

2. Any CWS or NTNCWS may be deemed, by the Director, to have optimized corrosion control treatment if the CWS or NTNCWS demonstrates to the satisfaction of the Director that it has conducted activities equivalent to the corrosion control steps applicable to such CWS or NTNCWS under this section.

If the Director makes this determination, a written notice explaining the basis for the decision will be provided and shall specify the water quality control parameters representing optimal corrosion control in accordance with § 705(F).

CWS or NTNCWS deemed to have optimized corrosion control under this subsection shall operate in compliance with the NNEPA-designated optimal water quality control parameters in accordance with § 705(G) and continue to conduct lead and copper tap and water quality parameter sampling in accordance with §§704(D)(4) and 707(D), respectively.

A CWS or NTNCWS shall provide the Director with the following information in order to support a determination under this subsection:

a. The results of all test samples collected for each of the water quality parameters in § 705(C) (3);

b. A report explaining the test methods used by the CWS or NTNCWS to evaluate the corrosion control treatments listed in § 705(C)(1), the results of all tests conducted, and the basis for the CWS or NTNCWS's selection of optimal corrosion control treatment;

c. A report explaining how corrosion control has been installed and how it is being maintained to insure minimal lead and copper concentrations at consumers' taps; and

d. The results of tap water samples collected in accordance with § 704 at least once every six months for one year after corrosion control has been installed.

3. Any CWS or NTNCWS is deemed to have optimized corrosion control if it submits results of tap water sampling conducted in accordance with § 704 and source water sampling conducted in accordance with § 708 that demonstrates for two consecutive six-month sampling periods that the difference between the 90th percentile tap water lead level computed under § 703(A)(3), and the highest source water lead concentration, is less than the Practical Quantitation Level (PQL) for lead specified in Appendix C 701-C (A)(1)(b).

a. Those CWS or NTNCWS whose highest source water lead level is below the Method Detection Limit may also be deemed to have optimized corrosion control under this subsection if the 90th percentile tap water lead level is less than or equal to the PQL for lead for two consecutive 6-month ~~monitoring~~sampling periods.

b. Any CWS or NTNCWS deemed to have optimized corrosion control in accordance with this subsection shall continue ~~monitoring~~sampling for lead and copper at the tap no less frequently than once every three calendar years using the reduced number of sites specified in § 704(C) and collecting the samples at times and locations specified in § 704 (D)(5)(d).

Any such CWS or NTNCWS that has not conducted a round of ~~monitoring~~sampling pursuant to § 704(D) since September 30, 1997, shall complete a round of ~~monitoring~~sampling pursuant to this section no later than September 30, 2000.

c. Any CWS or NTNCWS deemed to have optimized corrosion control pursuant to this subsection shall notify the Director in writing pursuant to § 712(A)(3) of any ~~change in treatment or the addition of a new source.~~ upcoming long-term change in treatment or addition of new source as described in that section. The Director must review and approve the addition of a new source or long-term change in water treatment before it is implemented by the water system. The Director may require any such CWS or NTNCWS to conduct additional ~~monitoring~~sampling or to take other action the Director deems appropriate to ensure that such CWS or NTNCWS maintain minimal levels of corrosion in the distribution system.

d. Upon promulgation of these regulations, a CWS or NTNCWS is not deemed to have optimized corrosion control under this subsection, and shall implement corrosion control treatment pursuant to subsection (B)(3)(e) of this section unless it meets the copper action level.

e. Any CWS or NTNCWS triggered into corrosion control because it is no longer deemed to have optimized corrosion control under this subsection shall implement corrosion control treatment in accordance with the deadlines in subsection (E) of this section.

Any such large CWS or NTNCWS shall adhere to the schedule specified in that subsection for medium-size CWS or NTNCWS, with the time periods for completing each step being triggered by the date the water system is no longer deemed to have optimized corrosion control under this subsection.

C. Any small or medium-size CWS or NTNCWS that is required to complete the corrosion control steps due to its exceedance of the lead or copper action level may cease completing the treatment steps whenever the CWS or NTNCWS meets both action levels during each of the two consecutive sampling periods conducted pursuant to § 704 and submits the results to the Director.

If any such CWS or NTNCWS, thereafter, exceeds the lead or copper action level during any sampling period, the CWS or NTNCWS shall recommence completion of the applicable treatment steps, beginning with the first treatment step which was not previously completed in its entirety.

The Director may require a CWS or NTNCWS to repeat treatment steps previously completed by the CWS or NTNCWS where the Director determines that this is necessary to implement properly the treatment requirements of this section.

The Director shall notify the CWS or NTNCWS in writing of such a determination and explain the basis for the decision.

The requirement for any small or medium-size CWS or NTNCWS to implement corrosion control treatment steps in accordance with subsection (E) of this section (including CWS or NTNCWSs deemed to have optimized corrosion control under subsection (B)(1) of this section) is triggered whenever any small- or medium-size CWS or NTNCWS exceeds the lead or copper action level.

D. Treatment steps and deadlines for large CWSs or NTNCWSs. Except as provided in subsection (B)(2) and (3) of this section, large CWSs or NTNCWSs shall complete the following corrosion control treatment steps (described in the referenced portions of §§ 705, 704, and 707) by the indicated dates.

1. Step 1: The CWS or NTNCWS shall conduct initial sampling §§ 704(D) (1) and 707(B) during two consecutive six-month sampling periods by January 1, 1993.

2. Step 2: The CWS or NTNCWS shall complete corrosion control studies (§ 705(C)) by July 1, 1994.

3. Step 3: The Director shall designate optimal corrosion control treatment (§ 705(D)) by January 1, 1995.

4. Step 4: The CWS or NTNCWS shall install optimal corrosion control treatment (§ 705(E)) by January 1, 1997.

5. Step 5: The CWS or NTNCWS shall complete follow-up sampling (§§ 704(D) (3) and 707(C)) by January 1, 1998.

6. Step 6: The Director shall review installation of treatment and designate optimal water quality control parameters (§ 705(F)) by July 1, 1998.

7. Step 7: The CWS or NTNCWS shall operate in compliance with the Director-specified optimal water quality control parameters (§ 705(G)) and continue to conduct tap sampling (§§ 704(D)(4) and 707(D)).

E. Treatment Steps and deadlines for small and medium-size CWSs or NTNCWSs. Except as provided in subsection (B) of this section, small and medium-size CWSs or NTNCWSs shall complete the following corrosion control treatment steps (described in the referenced portions of §§ 705, 704, and 707) by the indicated time periods.

1. Step 1: The CWS or NTNCWS shall conduct initial tap sampling (§§704(D)(1) and 707(B)) until the CWS or NTNCWS either exceeds the lead or copper action level or becomes eligible for reduced sampling under §704 (D)(5). A ~~CWS or NTNCWS~~ system exceeding the lead or copper action level shall recommend optimal corrosion control treatment (§705(A)) within six months after ~~it exceeds one of the action levels.~~ the end of the sampling period during which it exceeds one the action levels.

2. ~~Step 2: Within 12 months after a CWS or NTNCWS exceeds the lead or copper action level, the Director may require the CWS or NTNCWS to perform corrosion control studies (§ 705(B)).~~ Step 2: Within 12 months after the end of the sampling period during which a systems exceeds the lead or copper action level, the Director may require the system to perform corrosion control studies (§ 705(B)). If the Director does not require the CWS or NTNCWS to perform such studies, the Director shall specify optimal corrosion control treatment (§ 705(D)) within the following timeframes:

   a. ~~for medium-size CWSs or NTNCWSs, within 18 months after such CWS or NTNCWS exceeds the lead or copper action level.~~ For medium-size systems, within 18 months after the end of the sampling period during which such system exceeds the lead or copper action level.

b. ~~for small CWS or NTNCWSs, within 24 months after such CWS or NTNCWS exceeds the lead or copper action level.~~
For small systems, within 24 months after the end of the sampling period during which such system exceeds the lead or copper action level.

3. Step 3: If the Director requires a CWS or NTNCWS to perform corrosion control studies under Step 2, the CWS or NTNCWS shall complete the studies (§ 705(C)) within 18 months after the Director requires that such studies be conducted.

4. Step 4: If the CWS or NTNCWS has performed corrosion control studies under Step 2, the Director shall designate optimal corrosion control treatment (§ 705(D)) within 6 months after completion of Step 3.

5. Step 5: The CWS or NTNCWS shall install optimal corrosion control treatment (§ 705(E)) within 24 months after the Director designates such treatment.

6. Step 6: The CWS or NTNCWS shall complete follow-up sampling (§§ 704(D)(3) and 707(C)) within 36 months after the Director designates optimal corrosion control treatment.

7. Step 7: The Director shall review the CWS's or NTNCWS's installation of treatment and designate optimal water quality control parameters (§ 705(F)) within 6 months after completion of Step 6.

8. Step 8: The CWS or NTNCWS shall operate in compliance with the Director-designated optimal water quality control parameters (§ 705(G)) and continue to conduct tap sampling (§§ 704(D)(4) and 707(D)).

§ 707 SAMPLING REQUIREMENTS FOR WATER QUALITY PARAMETERS

All large CWSs or NTNCWSs and all small and medium-size CWSs or NTNCWSs that exceed the lead or copper action level shall sample water quality parameters in addition to lead and copper in accordance with this section. The requirements of this section are summarized in the table at the end of this section.

A. General Requirements:

1. Sample collection methods.

a. Tap samples shall be representative of water quality throughout the distribution system taking into account the number of persons served, the different sources of water, the different treatment methods employed by the CWS or NTNCWS, and seasonal variability. Tap sampling under this section is not required to be conducted at taps targeted for lead and copper sampling under § 704(A). [Note: CWSs or NTNCWSs may find it convenient to conduct tap sampling for water quality parameters at sites used for coliform sampling under § 404.]

b. Samples collected at the entry point(s) to the distribution CWS or NTNCWS shall be from locations representative of each source after treatment. If a CWS or NTNCWS draws water from more than one source and the sources are combined before distribution, the CWS or NTNCWS must sample at an entry point to the distribution system during periods of normal operating conditions (i.e., when water is representative of all sources being used).

2. Number of samples.

a. Except as provided in subsection (C)(3) of this section, CWSs or NTNCWSs shall collect two samples for each applicable water quality parameter at each entry point to the distribution system during each sampling period specified under subsections (B) of this section from the following number of sites.

TABLE 700.2 WATER QUALITY PARAMETER SAMPLING SITE

System size (# of people served)	# of sites for water quality parameters
>100,000	25

10,001 to 100,000	10
3,301 to 10,000	3
501 to 3,300	2
101 to 500	1
≤100	1

b. CWSs or NTNCWSs shall collect two samples for each applicable water quality parameter at each entry point to the distribution system during each sampling period specified in subsection (B) of this section. During each sampling period specified in subsections (C) through (E) of this section, CWSs or NTNCWSs shall collect one sample for each applicable water quality parameter at each entry point to the distribution system.

B. Initial sampling. All large CWSs or NTNCWSs shall measure the applicable water quality parameters as specified below at taps and at each entry point to the distribution system during each six-month sampling period specified in § 704(D)(2). All small and medium-size CWSs or NTNCWSs shall measure the applicable water quality parameters at the locations specified below during each six-month sampling period specified in §704(D)(2) during which the CWS or NTNCWS exceeds the lead or copper action level.

1. At taps:

a. pH;
b. Alkalinity;
c. Orthophosphate, when an inhibitor containing a phosphate compound is used;
d. Silica, when an inhibitor containing a silicate compound is used;
e. Calcium;
f. Conductivity; and
g. Water temperature.

2. At each entry point to the distribution system: all of the applicable parameters listed in subsection (B)(1) of this section.

C. Sampling after installation of corrosion control. Any large CWS or NTNCWS which installs optimal corrosion control treatment pursuant to § 706(D)(4) shall measure the water quality parameters at the locations and frequencies specified below during each six-month sampling period specified in § 704(D)(3)(a). Any small or medium-size CWS or NTNCWS which installs optimal corrosion control treatment shall conduct such sampling during each six-month sampling period specified in § 704(D)(3)(b) in which the CWS or NTNCWS exceeds the lead or copper action level.

1. At taps, two samples for:

a. pH;
b. Alkalinity;
c. Orthophosphate, when an inhibitor containing a phosphate compound is used;
d. Silica, when an inhibitor containing a silicate compound is used; and
e. Calcium, when calcium carbonate stabilization is used as part of corrosion control.

2. Except as provided in subsection (C)(3) of this section, at each entry point to the distribution system, at least one sample no less frequently than every two weeks (biweekly) for:

a. pH;
b. When alkalinity is adjusted as part of optimal corrosion control, a reading of the dosage rate of the chemical used to adjust alkalinity, and the alkalinity concentration; and
c. When a corrosion inhibitor is used as part of the optimal corrosion control, a reading of the dosage rate of the inhibitor used, and the concentration of orthophosphate or silica (whichever is applicable).

3. Any ground water system can limit entry point sampling described in subsection (C)(2) of this section to those entry points that are representative of water quality and treatment conditions throughout the water system. If water from untreated ground water sources mixes with water from treated ground water sources, the water system must monitor for water quality

parameters both at representative entry points receiving treatment and representative entry points receiving no treatment. Prior to the start of any ~~monitoring~~sampling under this subsection, the water system shall provide to the Director written information identifying the selected entry points and documentation, including information on seasonal variability, sufficient to demonstrate that the sites are representative of water quality and treatment conditions throughout the water system.

D. Sampling after the Director specifies water quality parameter values for optimal corrosion control. After the Director specifies the values for applicable water quality control parameters reflecting optimal corrosion control treatment under §705(F), all large CWSS or NTNCWSs shall measure the applicable water quality parameters in accordance with subsection (C) of this section and determine compliance with the requirements of § 705(G) every six months with the first six-month period to begin on ~~the date~~ either January 1 or July 1, whichever comes first, after the Director specifies the optimal values under § §705(F). Any small or medium-size CWS or NTNCWS shall conduct such sampling during each six-month period specified in this subsection in which the CWS or NTNCWS exceeds the lead or copper action level. For any such small and medium-size CWSs or NTNCWSs that is subject to a reduced ~~monitoring~~sampling frequency pursuant to § 704 (D)(5 at the time of the action level exceedance, the ~~end~~ start of the applicable six-month period under this subsection shall coincide with the ~~end~~ start of the applicable ~~monitoring~~sampling period under § 704 (D)(5). Compliance with Director-designated optimal water quality parameter values shall be determined as specified under § 705(G).

E. Reduced Sampling.

1. Any CWS or NTNCWS that maintains the range of values for the water quality parameters reflecting optimal corrosion control treatment during each of two consecutive six-month sampling periods under subsection (D) of this section shall continue sampling at the entry point(s) to the distribution system as specified in subsection (C)(2) of this section. Such CWS or NTNCWS may collect two tap samples for applicable water quality parameters from the following reduced number of sites during each six-month sampling period.

TABLE 700.3 REDUCED SAMPLING

System size (# of people served)	Reduced # of sites for water quality parameters
>100,000	10
10,001 to 100,000	7
3,301 to 10,000	3
501 to 3,300	2
101 to 500	1
≤100	1

2. a. Any CWS or NTNCWS that maintains the range of values for the water quality parameters reflecting optimal corrosion control treatment specified by the Director under § 705(F) during three consecutive years of sampling may reduce the frequency with which it collects the number of tap samples for applicable water quality parameters specified in subsection (E) (1) of this section from every six months to annually. This sampling begins during the calendar year immediately following the end of the sampling period in which the third consecutive year of six-month sampling occurs. Any water system that maintains the range of values for the water quality parameters reflecting optimal corrosion control treatment specified by the Director under §§705 (F) during three consecutive years of annual sampling under this subsection may reduce the frequency with which it collects the number of tap samples for applicable water quality parameters specified in subsection (E) (1) of this section from annually to every three years. This sampling begins no later than the third calendar year following the end of the sampling period in which the third consecutive year of sampling occurs.

b. A CWS or NTNCWS may reduce the frequency with which it collects tap samples for applicable water quality parameters specified in subsection (E)(1) of this section to every three years if it demonstrates during two consecutive ~~monitoring~~sampling periods that its tap water lead level at the 90th percentile is less than or equal to the PQL for lead specified in Appendix C -Lead/Copper, that its tap water copper level at the 90th percentile is less than or equal to 0.65 mg/L for copper in §703(A)(2), and that it also has maintained the range of values for the water quality parameters reflecting optimal corrosion control treatment specified by the Director under § 705(F). Sampling conducted every three years shall be done no later than every third calendar year.

3. A CWS or NTNCWS that conducts sampling annually shall collect these samples evenly throughout the year so as to reflect seasonal variability.

4. Any CWS or NTNCWS subject to reduced sampling frequency that fails to operate at or above the minimum value or within the range of values for the water quality parameters specified by the Director under § 705(F) for more than nine days in any six-month period specified in § 705(G) shall resume distribution system tap water sampling in accordance with the number and frequency requirements in subsection (D) of this section. Such a water system may resume annual ~~monitoring~~sampling for water quality parameters at the tap at the reduced number of sites specified in subsection (E)(1) of this section after it has completed two subsequent consecutive six-month rounds of ~~monitoring~~sampling that meet the criteria of that subsection and/or may resume triennial ~~monitoring~~sampling for water quality parameters at the tap at the reduced number of sites after it demonstrates through subsequent rounds of ~~monitoring~~sampling that it meets the criteria of either subsection (E)(2)(a) or (E)(2)(b) of this section.

F. Additional sampling by CWSs or NTNCWSs. The results of any sampling conducted in addition to the minimum requirements of this section shall be considered by the public water system and the Director in making any determinations (i.e., determining concentrations of water quality parameters) under this section or § 705.

TABLE 700.4 SUMMARY SAMPLING REQUIREMENTS FOR WATER QUALITY PARAMETERS[1]

SAMPLING PERIOD	PARAMETERS[2]	LOCATION	FREQUENCY
Initial Sampling	pH, alkalinity, orthophosphate or silica[3], calcium, conductivity, temperature	Taps and at entry point(s) to distribution system.	Every 6 months
After installation of Corrosion Control	pH, alkalinity, orthophosphate or silica[3], calcium[4]	Taps	Every 6 months
	pH, alkalinity dosage rate and concentration (if alkalinity adjusted as part of corrosion control), inhibitor dosage rate and inhibitor residual[5].	Entry point(s) to distribution system.	No less frequently than every two weeks.
After Director Specifies Parameter Values for Optimal Corrosion Control	pH, alkalinity, orthophosphate or silica[3], calcium[4]	Taps	Every 6 months
	pH, alkalinity dosage rate and concentration (if alkalinity adjusted as part of corrosion control), inhibitor dosage rate and inhibitor residual[5].	Entry point(s) to distribution system[6].	No less frequently than every two weeks.
Reduced Sampling	pH, alkalinity, orthophosphate or silica[3], calcium[4]	Taps	Every 6 months annually[7] or every 3 years[8] reduced number of sites.

	pH, alkalinity dosage rate and concentration (if alkalinity adjustment as part of corrosion control), inhibitor dosage rate and inhibitor residual[5].	Entry point(s) to distribution system[6].	No less frequently than every two weeks.

[1] Table is for illustrative purposes; consult the text of this section for precise regulatory requirements.
[2] Small and medium-size CWS or NTNCWSs have to sample for water quality parameters only during sampling periods in which the CWS or NTNCWS exceeds the lead or copper action level.
[3] Orthophosphate must be measured only when an inhibitor containing a phosphate compound is used. Silica must be measured only when an inhibitor containing a silicate compound is used.
[4] Calcium must be measured only when calcium carbonate stabilization is used as part of corrosion control.
[5] Inhibitor dosage rates and inhibitor residual concentrations (orthophosphate or silica) must be measured only when an inhibitor is used.

[6] Ground water systems may limit ~~monitoring~~sampling to representative locations throughout the water system.

[7] Water systems may reduce frequency of ~~monitoring~~sampling for water quality parameters at the tap from every six months to annually if they have maintained the range of values for water quality parameters reflecting optimal corrosion control during 3 consecutive years of ~~monitoring~~sampling.

[8] Water systems may further reduce the frequency of ~~monitoring~~sampling for water quality parameters at the tap from annually to once every 3 years if they have maintained the range of values for water quality parameters reflecting optimal corrosion control during 3 consecutive years of annual ~~monitoring~~sampling. Water systems may accelerate to triennial ~~monitoring~~sampling for water quality parameters at the tap if they have maintained 90th percentile lead levels less than or equal to 0.005 mg/L, 90th percentile copper levels less than or equal to 0.65 mg/L, and the range of water quality parameters designated by the Director under § 705(F) as representing optimal corrosion control during two consecutive six-month ~~monitoring~~sampling periods.

§ 708 SAMPLING REQUIREMENTS FOR LEAD AND COPPER IN SOURCE WATER

A. Sample location, collection methods, and number of samples.

1. A CWS or NTNCWS that fails to meet the lead or copper action level on the basis of tap samples collected in accordance with § 704 shall collect lead and copper source water samples in accordance with the following requirements regarding sample location, number of samples, and collection methods:

a. Groundwater systems shall take a minimum of one sample at every entry point to the distribution system which is representative of each well after treatment (hereafter called a sampling point). The water system shall take one sample at the same sampling point unless conditions make another sampling point more representative of each source or treatment plant.

b. Surface water systems shall take a minimum of one sample at every entry point to the distribution system after any application of treatment or in the distribution system at a point which is representative of each source after treatment (hereafter called a sampling point). The water system shall take each sample at the same sampling point unless conditions make another sampling point more representative of each source or treatment plant.

NOTE: For the purposes of this subsection, surface water systems include water systems with a combination of surface and ground sources.

c. If a water system draws water from more than one source and the sources are combined before distribution, the water system must sample at an entry point to the distribution system during periods of normal operating conditions (i.e., when water is representative of all sources being used).

d. The Director may reduce the total number of samples which must be analyzed by allowing the use of compositing. Compositing of samples must be done by certified laboratory personnel. Composite samples from a maximum of five samples are allowed, provided that if the lead concentration in the composite sample is greater than or equal to 0.001 mg/L or the copper concentration is greater than or equal to 0.160 mg/L, then either:

i. A follow-up sample shall be taken and analyzed within 14 days at each sampling point included in the composite; or

ii. If duplicates of or sufficient quantities from the original samples from each sampling point used in the composite are available, the water system may use these instead of resampling.

2. Where the results of sampling indicate an exceedance of maximum permissible source water levels established under § 709 (B)(4), the Director may require that one additional sample be collected as soon as possible after the initial sample was taken (but not to exceed two weeks) at the same sampling point. If a Director-required confirmation sample is taken for lead or copper, then the results of the initial and confirmation sample shall be averaged in determining compliance with the Director-specified maximum permissible levels. Any sample value below the detection limit shall be considered to be zero. Any value above the detection limit but below the PQL shall either be considered as the measured value or be considered as one-half the PQL.

B. Sampling frequency after CWS or NTNCWS exceeds tap water action level. Any CWS or NTNCWS which exceeds the lead or copper action level at the tap shall collect one source water sample from each entry point to the distribution system ~~within six months after the exceedance.~~ no later than six months after the end of the sampling period during which the lead or copper action level was exceeded. For sampling periods that are annual or less frequent, the end of the sampling period is September 30th of the calendar year in which the sampling occurs, or if the Director has established an alternate sampling period, the last day of that period.

C. Sampling frequency after installation of source water treatment. Any CWS or NTNCWS which installs source water treatment pursuant to § 709(A)(3) shall collect an additional source water sample from each entry point to the distr0ibution system during two consecutive six-month sampling periods by the deadline specified in §709(A)(4).

D. Sampling frequency after the Director specifies maximum permissible source water levels or determines that source water treatment is not needed.

1. A CWS or NTNCWS shall sample at the frequency specified below in cases where the Director specifies maximum permissible source water levels under §709(B)(4) or determines that the public water system is not required to install source water treatment under § 709(B)(2).

a. A CWS or NTNCWS using only groundwater shall collect samples once during the three-year compliance period (as that term is defined in § 104) in effect when the applicable Director determination under subsection (D)(1) of this section is made. Such water system shall collect samples once during each subsequent compliance period. Triennial samples shall be collected every third calendar year.

b. A CWS or NTNCWS using surface water (or a combination of surface and groundwater) shall collect samples once during each calendar year, the first annual sampling period to begin on ~~the date on~~ year in which the applicable Director determination is made under subsection (D)(1) of this section.

2. A CWS or NTNCWS is not required to conduct source water sampling for lead and/or copper if the water system meets the action level for the specific contaminant in tap water samples during the entire source water sampling period applicable to the water system under subsection (D)(1)(a) or (b) of this section.

E. Reduced sampling frequency.

1. A CWS or NTNCWS using only ground water may reduce the ~~monitoring~~sampling frequency for lead and copper in source water to once during each nine-year compliance cycle (as that term is defined in §104) provided that the samples are collected no later than every ninth calendar year and if the water system meets one of the following criteria:

a. The water system demonstrates that finished drinking water entering the distribution system has been maintained below the maximum permissible lead and copper

concentrations specified by the Director in §709(B)(4) during at least three consecutive compliance periods under subsection (D)(1) of this section; or

b. The Director has determined that source water treatment is not needed and the water system demonstrates that, during at least three consecutive compliance periods in which sampling was conducted under subsection (D)(1) of this section, the concentration of lead in source water was less than or equal to 0.005 mg/L and the concentration of copper in source water was less than or equal to 0.65 mg/L.

2. A CWS or NTNCWS using surface water (or a combination of surface water and ground water) may reduce the ~~monitoring~~sampling frequency in subsection (D)(1) of this section to once during each nine-year compliance cycle (as that term is defined in § 104) provided that the samples are collected no later than every ninth calendar year and if the water system meets one of the following criteria:

a. The CWS or NTNCWS demonstrates that finished drinking water entering the distribution system has been maintained below the maximum permissible lead and copper concentrations specified by the Director in §709(B)(4) for at least three consecutive years; or

b. The Director has determined that source water treatment is not needed and the CWS or NTNCWS demonstrates that, during at least three consecutive years, the concentration of lead in source water was less than or equal to 0.005 mg/L and the concentration of copper in source water was less than or equal to 0.65 mg/L.

3. A CWS or NTNCWS that uses a new source of water is not eligible for reduced sampling for lead and/or copper until concentrations in samples collected from the new source during three consecutive sampling periods are below the maximum permissible lead and copper concentrations specified by the Director in §709(A)(5).

§ 709 SOURCE WATER TREATMENT REQUIREMENTS

CWSs or NTNCWSs shall complete the applicable source water sampling and treatment requirements (described in the referenced portions of subsection (B) of this section, and in §§ 704 and 708) by the following deadlines:

A. Deadlines for Completing Source Water Treatment Steps:

1. Step 1: A CWS or NTNCWS exceeding the lead or copper action level shall complete lead or copper source water sampling (§708(B)) and make a treatment recommendation to the Director (§709(B)(1)) ~~within 6 months after~~ no later than 180 days after the end of the sampling period during which ~~exceeding~~ the lead or copper action level was exceeded.

2. Step 2: The Director shall make a determination regarding source water treatment (§ 709 (B)(2)) within 6 months after submission of sampling results under Step 1.

3. Step 3: If the Director requires installation of source water treatment, the CWS or NTNCWS shall install the treatment (§709 (B)(3)) within 24 months after completion of Step 2.

4. Step 4: The CWS or NTNCWS shall complete follow-up tap water sampling (§704(D)(3)) and source water sampling (§708(C)) within 36 months after completion of Step 2.

5. Step 5: The Director shall review the CWS's or NTNCWS's installation and operation of source water treatment and specify maximum permissible source water levels (§709(B)(4)) within 6 months after completion of Step 4.

6. Step 6: The public water system shall operate in compliance with the maximum permissible lead and copper source water levels (§709 (B)(4)) and continue source water sampling (§ 708 (D)).

B. Description of Source Water Treatment Requirements:

1. CWS or NTNCWS treatment recommendation. Any CWS or NTNCWS which exceeds the lead or copper action level shall recommend in writing to the Director the installation and operation of one of the source water treatments listed in subsection (B)(2) of this section. A CWS or

NTNCWS may recommend that no treatment be installed based upon a demonstration that source water treatment is not necessary to minimize lead and copper levels at users' taps.

2. Director determination regarding source water treatment. The Director shall complete an evaluation of the results of all source water samples submitted by the CWS or NTNCWS to determine whether source water treatment is necessary to minimize lead or copper levels in water delivered to users' taps. If the Director determines that treatment is needed, the Director shall either require installation and operation of the source water treatment recommended by the CWS or NTNCWS (if any) or require the installation and operation of another source water treatment from among the following: ion exchange, reverse osmosis, lime softening, or coagulation/filtration.

   If the Director requests additional information to aid in his/her review, the CWS or NTNCWS shall provide the information by the date specified by the Director in his/her request. The Director shall notify the system in writing of the determination and set forth the basis for his/her decision.

3. Installation of source water treatment. Each CWS or NTNCWS shall properly install and operate the source water treatment designated by the Director under subsection (B)(2) of this section.

4. Director review of source water treatment and specification of maximum permissible source water levels. The Director shall review the source water samples taken by the CWS or NTNCWS both before and after the system installs source water treatment, and determine whether the CWS or NTNCWS has properly installed and operated the source water treatment designated by the Director. Based upon this review, the Director shall designate the maximum permissible lead and copper concentrations for finished water entering the distribution system. Such levels shall reflect the contaminant removal capability of the treatment properly operated and maintained. The Director shall notify the CWS or NTNCWS in writing and explain the basis for the decision.

5. Continued operation and maintenance. Each CWS or NTNCWS shall maintain lead and copper levels below the maximum permissible concentrations designated by the Director at each sampling point sampled in accordance with § 708. The CWS or NTNCWS is out of compliance with this subsection if the level of lead or copper at any sampling point is greater than the maximum permissible concentration designated by the Director.

6. Modification of the Director treatment decisions. Upon the Director's own initiative or in response to a request by a CWS or NTNCWS or other interested party, the Director may modify the determination of the source water treatment under subsection (B)(2) of this section, or maximum permissible lead and copper concentrations for finished water entering the distribution system under subsection (B)(4) of this section. A request for modification by a CWS or NTNCWS or other interested party shall be in writing, explain why the modification is appropriate, and provide supporting documentation. The Director may modify a determination where the Director concludes that such change is necessary to ensure that the CWS or NTNCWS continues to minimize lead and copper concentrations in source water. A revised determination shall be made in writing, set forth the new treatment requirements, explain the basis for the Director's decision, and provide an implementation schedule for completing the treatment modifications.

7. Treatment decisions by EPA in lieu of the Director. Pursuant to the procedures in 40 CFR § 142.19, the EPA Regional Administrator may review treatment determinations made by the Director under subsections (B)(2), (B)(4), or (B)(6) of this section and issue Federal treatment determinations consistent with the requirements of those subsections where the Administrator finds that:

   a. The Director has failed to issue a treatment determination by the applicable deadlines contained in § 709(A);

   b. The Director has abused his/her discretion in a substantial number of cases or in cases affecting a substantial population; or

   c. The technical aspects of the Director's determination would be indefensible in an expected Federal enforcement action taken against a system.

§ 710 LEAD SERVICE LINE REPLACEMENT REQUIREMENTS

A. CWS or NTNCWSs that fail to meet the lead action level in tap samples taken pursuant to § 704 (D)(3), after installing corrosion control and/or source water treatment (whichever sampling occurs later), shall replace lead service lines in accordance with requirements of this section. If a CWS or NTNCWS is in violation of § 706 or § 709 for failure to install source water or corrosion control treatment, the Director may require the public water system to commence lead service line replacement under this section after the date by which the CWS or NTNCWS was required to conduct sampling under § 704 (D)(3) has passed.

B. 1. A CWS or NTNCWS shall replace annually at least 7 % of the initial number of lead service lines in the distribution system. The initial number of lead service lines is the number of lead lines in place at the time the replacement program begins. The CWS or NTNCWS shall identify the initial number of lead service lines in its distribution system, including an identification of the portion(s) owned by the water system, based on a materials evaluation, including the evaluation required under § 704(A) and relevant legal authorities (e.g., contracts, local ordinances) regarding the portion owned by the water system. The first year of lead service line replacement shall begin on the date the action level was exceeded in tap sampling referenced in subsection (A) of this section. The first year of lead service line replacement shall begin on the first day following the end of the sampling period in which the action level was exceeded under subsection (A) of this section. If sampling is required annually or less frequently, the end of the sampling period is September 30th of the calendar year in which the sampling occurs. If the Director has established an alternate sampling period, then the end of the sampling period will be the last day of that period.

2. Any water system resuming a lead service line replacement program after the cessation of its lead service line replacement program as allowed by subsection (F) of this section shall update it inventory of lead service lines to include those sites that were previously determined not to require replacement through the sampling provision under subsection (C) of this section. The system will then divide the updated number of remaining lead service lines by the number of remaining years in the program to determine the number of lines that must be replaced per year (7 percent lead service line replacement is based on a 15-year replacement program, so for example, systems resuming lead service line replacement after previously conducting two years of replacement would divide the updated inventory by 13). For those systems that have completed a 15-year lead service line replacement program, the Director will determine a schedule for replacing or retesting lines that were previously tested out under the replacement program when the system re-exceeds the action level.

C. A CWS or NTNCWS is not required to replace an individual lead service line if the lead concentration in all service line samples from that line, taken pursuant to § 704(B)(3), is less than or equal to 0.015 mg/L.

D. A CWS or NTNCWS shall replace that portion of the lead service line that it owns. In cases where the water system does not own the entire lead service line, the water system shall notify the owner of the line, or the owner's authorized agent, that the water system will replace the portion of the service line that it owns and shall offer to replace the owner's portion of the line. A water system is not required to bear the cost of replacing the privately-owned portion of the line, nor is it required to replace the privately-owned portion where the owner chooses not to pay the cost of replacing the privately-owned portion of the line, or where replacing the privately-owned portion would be precluded by tribal, local or common law. A water system that does not replace the entire length of the service line also shall complete the following tasks.

1. At least 45 days prior to commencing with the partial replacement of a lead service line, the water system shall provide notice to the resident(s) of all buildings served by the line explaining that they may experience a temporary increase of lead levels in their drinking water, along with guidance on measures consumers can take to minimize their exposure to lead. The Director may allow the water system to provide notice under the previous sentence less than 45 days prior to commencing partial lead service line replacement where such replacement is in conjunction with emergency repairs. In addition, the water system shall inform the resident(s) served by the line that the water system will, at the water system's expense, collect a sample from each partially-replaced lead service line that is representative of the water in the service line for analysis of lead content, as prescribed under § 704(B)(3), within 72 hours after the completion of the partial replacement of the

service line. The water system shall collect the sample and report the results of the analysis to the owner and the resident(s) served by the line within three business days of receiving the results. Mailed notices post-marked within three business days of receiving the results shall be considered "on time."

2. The water system shall provide the information required by subsection (D)(1) of this section to the residents of individual dwellings by mail or by other methods approved by the Director. In instances where multi-family dwellings are served by the line, the water system shall have the option to post the information at a conspicuous location.

E. The Director shall require a CWS or NTNCWS to replace lead service lines on a shorter schedule than that required by this section, taking into account the number of lead service lines in the CWS or NTNCWS, where such a shorter replacement schedule is feasible. The Director shall make this determination in writing and notify the CWS or NTNCWS of the findings within 6 months after the CWS or NTNCWS is triggered into lead service line replacement based on sampling referenced in subsection (A) of this section.

F. Any CWS or NTNCWS may cease replacing lead service lines whenever first draw samples collected pursuant to § 704(B)(2) meet the lead action level during each of two consecutive sampling periods and the CWS or NTNCWS submits the results to the Director. If the first draw tap samples collected in any such public water system thereafter exceeds the lead action level, the public water system shall recommence replacing lead service lines, pursuant to subsection (B) in this section.

G. To demonstrate compliance with subsections (A) through (D) of this section, a CWS or NTNCWS shall report to the Director the information specified in § 712(E).

§ 711 PUBLIC EDUCATION AND SUPPLEMENTAL SAMPLING REQUIREMENTS

~~A. A CWS or NTNCWS that exceeds the lead action level based on tap water samples collected in accordance with § 704 shall deliver the public education materials contained in subsections (A) and (B) of this section in accordance with the requirements in subsection (C) of this section.~~

~~1. Community Water Systems: Content of written public education materials. A CWS shall include the following text in all of the printed materials it distributes through its lead public education program. Water systems may delete information pertaining to lead service lines, upon approval by the Director, if no lead service lines exist anywhere in the water system service area. Public education language at subsections (A)(1)(d)(ii)(5) and (A)(1)(d)(iv)(2) of this section may be modified regarding building permit record availability and consumer access to these records, if approved by the Director. Water systems may also continue to utilize pre-printed materials that meet the public education language requirements in § 711. Any additional information presented by a system shall be consistent with the information below and be in plain English, or plain English and plain Navajo that can be understood by lay people.~~

~~a. Introduction. EPA and [please insert name of water supplier] are concerned about lead in your drinking water. Although most homes have very low levels of lead in their drinking water, some homes in the community have lead levels above the EPA action level of 15 parts per billion (ppb), or 0.015 milligrams of lead per liter of water (mg/L). Under Federal law, we are required to have a program in place to minimize lead in your drinking water by [insert date when corrosion control will be completed for your public water system]. This program includes corrosion control treatment, source water treatment, and public education. We are also required to replace the portion of each lead service line that we own if the line contributes lead concentrations of more than 15 ppb after we have completed the comprehensive treatment program. If you have any questions about how we are carrying out the requirements of the lead regulation please give us a call at [insert public water system's phone number]. This brochure explains the simple steps you can take to protect you and your family by reducing your exposure to lead in drinking water.~~

~~b. Health effects of lead. Lead is a common metal found throughout the environment in lead based paint, air, soil, household dust, food, certain types of pottery, porcelain and pewter, and water. Lead can pose a significant risk to your health if too much of it enters your body. Lead builds up in the body over many years and can cause damage to the brain, red blood cells and kidneys. The greatest risk is to young children and pregnant women. Amounts of lead that won't hurt adults can slow down normal mental and physical development of growing bodies. In addition, a child at play often comes into contact with sources of lead contamination like~~

dirt and dust that rarely affect an adult. It is important to wash children's hands and toys often, and to try to make sure they only put food in their mouths.

c. Lead in Drinking Water.

i. Lead in drinking water, although rarely the sole cause of lead poisoning, can significantly increase a person's total lead exposure, particularly the exposure of infants who drink baby formulas and concentrated juices that are mixed with water. The EPA estimates that drinking water can make up 20 % or more of a person's total exposure to lead.

ii. Lead is unusual among drinking water contaminants in that it seldom occurs naturally in water supplies like rivers and lakes. Lead enters drinking water primarily as a result of the corrosion, or wearing away, of materials containing lead in the water distribution system and household plumbing. These materials include lead based solder used to join copper pipe, brass and chrome plated brass faucets, and in some cases, pipes made of lead that connect your house to the water main (service lines). In 1986, Congress banned the use of lead solder containing greater than 0.2% lead, and restricted the lead content of faucets, pipes and other plumbing materials to 8.0%.

iii. When water stands in lead pipes or plumbing systems containing lead for several hours or more, the lead may dissolve into your drinking water. This means the first water drawn from the tap in the morning, or later in the afternoon after returning from work or school, can contain fairly high levels of lead.

d. Steps You Can Take in the Home to Reduce Exposure to Lead in Drinking Water.

i. Despite our best efforts mentioned earlier to control water corrosivity and to remove lead from the public water systems, lead levels in some homes or buildings can be high. To find out whether you need to take action in your own home, have your drinking water tested to determine if it contains excessive concentrations of lead. Testing the water is essential because you cannot see, taste, or smell lead in drinking water. Some local laboratories that can provide this service are listed at the end of this booklet. For more information on having your water tested, please call [insert phone number of public water system].

ii. If a water test indicates that the drinking water drawn from a tap in your home contains lead above 15 ppb, then you should take the following precautions:

1. Let the water run from the tap before using it for drinking or cooking any time the water in a faucet has gone unused for more than six hours. The longer water resides in your home's plumbing the more lead it may contain. Flushing the tap means running the cold water faucet until the water gets noticeably colder, usually about 15-30 seconds. If your house has a lead service line to the water main, you may have to flush the water for a longer time, perhaps one minute, before drinking. Although toilet flushing or showering flushes water through a portion of your home's plumbing system, you still need to flush the water in each faucet before using it for drinking or cooking. Flushing tap water is a simple and inexpensive measure you can take to protect your family's health. It usually uses less than one or two gallons of water and costs less than [insert a cost estimate based on flushing two times a day for 30 days] per month. To conserve water, fill a couple of bottles for drinking water after flushing the tap, and whenever possible use the first flush water to wash the dishes or water the plants. If you live in a high rise building, letting the water flow before using it may not work to lessen your risk from lead. The plumbing systems have more and sometimes larger pipes than smaller buildings. Ask your landlord for help in locating the source of the lead and for advice on reducing the lead level.

2. Try not to cook with or drink water from the hot water tap. Hot water can dissolve more lead more quickly than cold water. If you need hot water, draw water from the cold tap and heat it on the stove.

3. Remove the loose lead solder and debris from plumbing materials installed in newly constructed homes, or homes in which the plumbing has recently been replaced, by removing the faucet strainers from all taps and running the water from 3 to 5 minutes. Thereafter, periodically remove the strainers and flush out any debris that has accumulated over time.

4. If your copper pipes are joined with lead solder that has been installed illegally since it was banned in 1986, notify the plumber who did the work and request that he or she replace the lead solder with lead-free solder. Lead solder looks dull gray, and when scratched with a key looks shiny. In addition, notify the NNEPA's PWSSP about the violation.

5. Determine whether or not the service line that connects your home or apartment to the water main is made of lead. The best way to determine if your service line is made of lead is by either hiring a licensed plumber to inspect the line or by contacting the plumbing contractor who installed the line. You can identify the plumbing contractor by checking the city's record of building permits which should be maintained in the files of the [the name of the department that issues building permits]. A licensed plumber can at the same time check to see if your home's plumbing contains lead solder, lead pipes, or pipe fittings that contain lead. The public water system that delivers water to your home should also maintain records of the materials located in the distribution system. If the service line that connects your dwelling to the water main contributes more than 15 ppb to drinking water, after our comprehensive treatment program is in place, we are required to replace the line. If the line is only partially controlled by the [insert name of the public water system that controls the line], we are required to provide the owner of the privately owned portion of the line with information on how to replace the privately owned portion of the service line, and offer to replace that portion of the line at the owner's expense. If we replace only the portion of the line that we own, we also are required to notify you in advance and provide you with information on the steps you can take to minimize exposure to any temporary increase in lead levels that may result from the partial replacement, to take a follow-up sample at our expense from the line within 72 hours after the partial replacement, and to mail or otherwise provide you with the results of that sample within three business days of receiving the results. Acceptable replacement alternatives include copper, steel, iron, and plastic pipes.

6. Have an electrician check your wiring. If grounding wires from the electrical system are attached to your pipes, corrosion may be greater. Check with a licensed electrician or your local electrical code to determine if your wiring can be grounded elsewhere. DO NOT attempt to change the wiring yourself because improper grounding can cause electrical shock and fire hazards.

iii. The steps described above will reduce the lead concentrations in your drinking water. However, if a water test indicates that the drinking water coming from your tap contains lead concentrations in excess of 15 ppb after flushing, or after we have completed our actions to minimize lead levels, then you may want to take the following additional measures:

1. Purchase or lease a home treatment device. Home treatment devices are limited in that each unit treats only the water that flows from the faucet to which it is connected, and all of the devices require periodic maintenance and replacement. Devices such as reverse osmosis or distillers can effectively remove lead from your drinking water. Some activated carbon filters may reduce lead levels at the tap, however all lead reduction claims should be investigated. Be sure to check the actual performance of a specific home treatment device before and after installing the unit.

2. Purchase bottled water for drinking and cooking.

iv. You can consult a variety of sources for additional information. Your family doctor or pediatrician can perform a blood test for lead and provide you with information about the health effects of lead. Government agencies that can be contacted include:

1. The NNEPA PWSSP at (928) 871 7755 or contact Navajo Tribal Utility Authority at (928) 729 5721 can provide you with information about your community's public water system, and a list of local laboratories that have been certified by EPA for testing water quality;

2. The Director of Indian Health Service (928) 729 8400 or 729 8000 can provide you with information about the health effects of lead and how you can have your child's blood tested.

v. The following is an approved laboratory in your area that you can call to have your water tested for lead. NTUA Laboratory at (928) 729 5721.

2. Non transient non community water systems.

A NTNCWS shall either include the text specified in subsection (A)(1) of this section or shall include the following text in all of the printed materials it distributes through its lead public education program. Water systems may delete information pertaining to lead service lines upon approval by the Director if no lead service lines exist anywhere in the water system service area. Any additional information presented by a water system shall be consistent with the information below and be in plain English, or plain English and plain Navajo that can be understood by lay people.

a. Introduction. EPA and [insert name of water supplier] are concerned about lead in your drinking water. Some drinking water samples taken from this facility have lead levels above the EPA action level of 15 parts per billion (ppb), or 0.015 milligrams of lead per liter of water (mg/L). Under Federal law we are required to have a program in place to minimize lead in your drinking water by [insert date when corrosion control will be completed for your water system]. This program includes corrosion control treatment, source water treatment, and public education. We are also required to replace the portion of each lead service line that we own if the line contributes lead concentrations of more than 15 ppb after we have completed the comprehensive treatment program. If you have any questions about how we are carrying out the requirements of the lead regulation please give us a call at [insert water system's phone number]. This brochure explains the simple steps you can take to protect yourself by reducing your exposure to lead in drinking water.

b. Health effects of lead. Lead is found throughout the environment in lead based paint, air, soil, household dust, food, certain types of pottery porcelain and pewter, and water. Lead can pose a significant risk to your health if too much of it enters your body. Lead builds up in the body over many years and can cause damage to the brain, red blood cells and kidneys. The greatest risk is to young children and pregnant women. Amounts of lead that won't hurt adults can slow down normal mental and physical development of growing bodies. In addition, a child at play often comes into contact with sources of lead contamination like dirt and dust that rarely affect an adult. It is important to wash children's hands and toys often, and to try to make sure they only put food in their mouths.

c. Lead in drinking water.

i. Lead in drinking water, although rarely the sole cause of lead poisoning, can significantly increase a person's total lead exposure, particularly the exposure of infants who drink baby formulas and concentrated juices that are mixed with water. EPA estimates that drinking water can make up 20 percent or more of a person's total exposure to lead.

ii. Lead is unusual among drinking water contaminants in that it seldom occurs naturally in water supplies like rivers and lakes. Lead enters drinking water primarily as a result of the corrosion, or wearing away, of materials containing lead in the water distribution system and household plumbing. These materials include lead based solder used to join copper pipe, brass and chrome plated brass faucets, and in some cases, pipes made of lead that connect houses and buildings to water mains (service lines). In 1986, Congress banned

the use of lead solder containing greater than 0.2% lead, and restricted the lead content of faucets, pipes and other plumbing materials to 8.0%.

iii. When water stands in lead pipes or plumbing water systems containing lead for several hours or more, the lead may dissolve into your drinking water. This means the first water drawn from the tap in the morning, or later in the afternoon if the water has not been used all day, can contain fairly high levels of lead.

d. Steps you can take to reduce exposure to lead in drinking water.

i. Let the water run from the tap before using it for drinking or cooking any time the water in a faucet has gone unused for more than six hours. The longer water resides in plumbing the more lead it may contain. Flushing the tap means running the cold water faucet for about 15-30 seconds. Although toilet flushing or showering flushes water through a portion of the plumbing water system, you still need to flush the water in each faucet before using it for drinking or cooking. Flushing tap water is a simple and inexpensive measure you can take to protect your health. It usually uses less than one gallon of water.

ii. Do not cook with, or drink water from the hot water tap. Hot water can dissolve lead more quickly than cold water. If you need hot water, draw water from the cold tap and then heat it.

iii. The steps described above will reduce the lead concentrations in your drinking water. However, if you are still concerned, you may wish to use bottled water for drinking and cooking.

iv. You can consult a variety of sources for additional information. Your family doctor or pediatrician can perform a blood test for lead and provide you with information about the health effects of lead. NNEPA and local government agencies that can be contacted include:

1. [insert the name or title of facility official if appropriate] at [insert phone number] can provide you with information about your facility's water supply; and

2. The Director of Indian Health Service (928) 729-8400 or 729-8000 can provide you with information about the health effects of lead.

B. Content of broadcast materials. A public water system shall include the following information in all public service announcements submitted under its lead public education program to television and radio stations for broadcasting:

1. Why should everyone want to know the facts about lead and drinking water? Because unhealthy amounts of lead can enter drinking water through the plumbing in your home. That's why I urge you to do what I did. I had my water tested for [insert "free" or $ per sample]. You can contact the [insert the name of the public water system for information on testing and on simple ways to reduce your exposure to lead in drinking water.

2. To have your water tested for lead, or to get more information about this public water concern, please call [the phone number of the public water system.

C. Delivery of a public education program.

1. In communities where a significant proportion of the population speaks Navajo, public education materials shall be communicated in Navajo, as well as English, whenever possible.

2. A CWS that exceeds the lead action level on the basis of tap water samples collected in accordance with § 704, and that is not already repeating public education tasks pursuant to subsection (C)(3), (C)(7), or (C)(8), of this section, shall, within 60 days:

a. Insert notices in each customer's water utility bill containing the information in subsection (A)(1) of this section, along with the following alert on the water bill itself in large print:

"SOME HOMES IN THIS COMMUNITY HAVE ELEVATED LEAD LEVELS IN THEIR DRINKING WATER. LEAD CAN POSE A SIGNIFICANT RISK TO YOUR HEALTH. PLEASE READ THE ENCLOSED NOTICE FOR FURTHER INFORMATION." A CWS having a billing cycle that does not include a billing within 60 days of exceeding the action level, or that cannot insert information in the water utility bill without making major changes to its billing water system, may use a separate mailing to deliver the information in subsection (A)(1) of this section as long as the information is delivered to each customer within 60 days of exceeding the action level. Such water systems shall also include the "alert" language specified in this subsection.

b. Submit the information in subsection (A)(1) of this section to the editorial departments of the major daily and weekly newspapers circulated throughout the community.

c. Deliver pamphlets and/or brochures that contain the public education materials in subsections (A)(1)(b) and (A)(1)(d) of this section to facilities and organizations, including the following:

i. Public schools and/or local school boards;
ii. Federal or tribal health department;
iii. Women, Infants, and Children and/or Head Start Program(s) whenever available;
iv. Public and private hospitals and/or clinics;
v. Pediatricians;
vi. Family planning clinics; and
vii. Local welfare agencies.

d. Submit the public service announcement to at least five of the radio and television stations with the largest audiences that broadcast to the community served by the public water system.

3. A CWS shall repeat the tasks contained in subsections (C)(2)(a), (b) and (c) of this section every 12 months, and the tasks contained in subsections (C)(2)(d) of this section every 6 months for as long as the water system exceeds the lead action level.

4. Within 60 days after it exceeds the lead action level, (unless it already is repeating public education tasks pursuant to subsection (C)(5) of this section), a NTNCWS shall deliver the public education materials contained in subsections (A)(1), or the public education materials specified by subsection (A)(2) of this section as follows:

a. Post informational posters on lead in drinking water in a public place or common area in each of the buildings served by the water system; and

b. Distribute informational pamphlets and/or brochures on lead in drinking water to each person served by the NTNCWS. The Director may allow the water system to utilize electronic transmission in lieu of or combined with printed materials as long as it achieves at least the same coverage.

5. A NTNCWS shall repeat the tasks contained in subsection (C)(4) of this section at least once during each calendar year in which the public water system exceeds the lead action level.

6. A public water system may discontinue delivery of public education materials if the water system has met the lead action level during the most recent six-month sampling period conducted pursuant to § 704. Such a water system shall recommence public education in accordance with this section if it subsequently exceeds the lead action level during any sampling period.

7. A CWS may apply to the Director, in writing, (unless the Director has waived the requirement for prior Director approval) to use the text specified in subsection (A)(2) of this section in lieu of the text in subsection (A)(1) of this section and to perform the tasks listed in subsections (C)(4) and (C)(5) of this section in lieu of the tasks in subsections (C)(2) and (C)(3) of this section if:

a. The water system is a facility, such as a prison or a hospital, where the population served is not capable of or is prevented from making improvements to plumbing or installing point of use treatment devices; and

~~b. The water system provides water as part of the cost of services provided and does not separately charge for water consumption.~~

~~8. a. A CWS serving 3,300 or fewer people may omit the task contained in subsection (C)(2)(d) of this section. As long as it distributes notices containing the information contained in subsection (A)(1) of this section to every household served by the public water system, such water systems may further limit their public education programs as follows:~~

~~i. Water systems serving 500 or fewer people may forego the task contained in subsection (C)(2)(b) of this section. Such a water system may limit the distribution of the public education materials required under subsection (C)(2)(c) of this section to facilities and organizations served by the water system that are most likely to be visited regularly by pregnant women and children, unless it is notified by the Director in writing that it must make a broader distribution.~~

~~ii. If approved by the Director in writing, a water system serving 501 to 3,300 people may omit the task in subsection (C)(2)(b) of this section and/or limit the distribution of the public education materials required under subsection (C)(2)(c) of this section to facilities and organizations served by the water system that are most likely to be visited regularly by pregnant women and children.~~

~~b. A CWS serving 3,300 or fewer people that delivers public education in accordance with subsection (C)(8)(a) of this section shall repeat the required public education tasks at least once during each calendar year in which the water system exceeds the lead action level.~~

~~D. Supplemental sampling and notification of results. A public water system that fails to meet the lead action level on the basis of tap samples collected in accordance with § 704 shall offer to sample the tap water of any customer who requests it. The public water system is not required to pay for collecting or analyzing the sample, nor is the public water system required to collect and analyze the sample itself.~~

All water systems must deliver a consumer notice of lead tap water sampling results to persons served by the water system at sites that are tested, as specified in subsection (D) of this section. A water system that exceeds the lead action level based on tap water samples collected in accordance with § 704 shall deliver the public education materials contained in subsection (A) of this section in accordance with the requirements in subsection (B) of this section. Water systems that exceed the lead action level must sample the tap water of any customer who requests it in accordance with subsection (C) of this section.

A. Content of written public education materials.

1. Community water systems and non-transient non-community water systems. Water systems must include the following elements in printed materials (e.g., brochures and pamphlets) in the same order as listed below. In addition, language in subsections (A)(1)(a) through (b) and (A)(1)(c) of this section must be included in the materials, exactly as written, except for the text in brackets in these subsections for which the water system must include system-specific information. Any additional information presented by a water system must be consistent with the information below and be in plain language that can be understood by the general public. Water systems must submit all written public education materials to the Director prior to delivery. The Director may require the system to obtain approval of the content of written public materials prior to delivery.

a. IMPORTANT INFORMATION ABOUT LEAD IN YOUR DRINKING WATER. [INSERT NAME OF WATER SYSTEM] found elevated levels of lead in drinking water in some homes/buildings. Lead can cause serious health problems,

especially for pregnant women and young children. Please read this information closely to see what you can do to reduce lead in your drinking water.

b. Health effects of lead. Lead can cause serious health problems if too much enters your body from drinking water or other sources. It can cause damage to the brain and kidneys, and can interfere with the production of red blood cells that carry oxygen to all parts of your body. The greatest risk of lead exposure is to infants, young children, and pregnant women. Scientists have linked the effects of lead on the brain with lowered IQ in children. Adults with kidney problems and high blood pressure can be affected by low levels of lead more than healthy adults. Lead is stored in the bones, and it can be released later in life. During pregnancy, the child receives lead from the mother's bones, which may affect brain development.

c. Sources of lead

1. Explain what lead is.

2. Explain possible sources of lead in drinking water and how lead enters drinking water. Include information on home/building plumbing materials and service lines that may contain lead.

3. Discuss other important sources of lead exposure in addition to drinking water (e.g., paint).

d. Discuss the steps the consumer can take to reduce their exposure to lead in drinking water.

1. Encourage running the water to flush out the lead.

2. Explain concerns with using hot water from the tap and specifically caution against the use of hot water for preparing baby formula.

3. Explain that boiling water does not reduce lead levels.

4. Discuss other options consumers can take to reduce exposure to lead in drinking water, such as alternative sources or treatment of water.

5. Suggest that parents have their child's blood tested for lead.

e. Explain why there are elevated levels of lead in the system's drinking water (if known) and what the water system is doing to reduce the lead levels in homes/buildings in this area.

f. For more information call us at (928) 871-7755 or visit our website at www.navajopublicwater.org. For more information on reducing lead exposure around your home/building and the health effects of lead, visit EPA's website at http://www.epa.gov/lead or contact your health care provider.

2. Community water systems. In addition to including the elements specified in subsection

(A)(1) of this section, community water systems must:

a. Tell consumers how to get their water tested.

b. Discuss lead in plumbing components and the difference between low lead and lead free.

B. Delivery of public education materials.

1. For public water systems serving a large proportion of non-English speaking consumers, as determined by the Director, the public education materials must contain information in the appropriate language(s) regarding the importance of the notice or contain a telephone number or address where persons served may contact the water system to obtain a translated copy of the public education materials or to request assistance in the appropriate language.

2. A community water system that exceeds the lead action level on the basis of tap water samples collected in accordance with § 704, and that is not already conducting public education tasks under this section, must conduct the public education tasks under this section within 60 days after the end of the sampling period of in which the exceedance occurred.

a. Deliver printed materials meeting the content requirements of subsection (A) of this section to all bill paying customers.

b. i. Contact customers who are most at risk by delivering education materials that meet the content requirements of subsection (A) of this section to local public health agencies even if they are not located within the water system's service area, along with an informational notice that encourages distribution to all the organization's potentially affected customers or community water system's users. The water system must contact the local public health agencies directly by phone or in person. The local public health agencies may provide a specific list of additional community based organizations serving target populations, which may include or organizations outside the service area of the water system. If such lists are provide, systems must deliver education materials that meet the content requirements of subsection (A) of this section to all organizations on the provided list.

ii. Contact customers who are most at risk by delivering materials that meet the content requirements of subsection (A) of this section to the following organizations listed in 1 through 6 that are located within the water system's service area, along with an informational notice that encourages distribution to all the organization's potentially affected customers or community water system's users:

A. Public and private schools or school boards.
B. Women, Infants, and Children (WIC) and Head Start programs.
C. Public and private hospitals and medical clinics.
D. Pediatricians.
E. Family planning clinics.

F. Local welfare agencies.

iii. Make a good faith effort to locate the following organizations within the service area and deliver materials that meet the content requirements of subsection (A) of this section to them, along with an informational notice that encourages distribution to all potentially affected customers or users. The good faith effort to contact at-risk customers may include requesting a specific contact list of these organizations from the local public health agencies, even if the agencies are not located within the water system's service area:

A. Licensed childcare centers
B. Public and private preschools
C. Obstetricians-Gynecologist and Midwives.

c. No less often than quarterly, provide information on or in each water bill as long as the system exceeds the action level for lead. The message on the water bill must include the following statement exactly as written except for the text in brackets for which the water system must include system-specific information: [INSERT NAME OF WATER SYSTEM] found high levels of lead in drinking water in some homes. Lead can cause serious health problems. For more information please call [INSERT NAME OF WATER SYSTEM] [or visit (INSERT YOUR WEB SITE HERE)]. The message or delivery mechanism can be modified in consultation with the Director; specifically, the Director may allow a separate mailing of public education materials to customers if the water system cannot place the information on water bills.

d. Post material meeting the content requirements of subsection (A) of this section on the water system's Web site if the system serves a population greater than 100,000.

e. Submit a press release to newspaper, television and radio stations.

f. In addition to subsection (B)(2)(a) through (e) of this section, systems must implement at least three activities from one or more categories listed below. The educational content and selection of these activities must be determined in consultation with the Director.

i. Public Service Announcements
ii. Paid advertisements
iii. Public Area Information Displays
iv. E-mails to customers
v. Public Meetings
vi. Household deliveries
vii. Targeted Individual Customer Contact
viii. Direct material distribution to all multi-family homes and institutions
ix. Other methods approved by the Director

g. For systems that are required to conduct sampling annually or less frequently, the end of the sampling period is September 30th of the calendar year in which the

sampling occurs, or, if the Director has established an alternate sampling period, the last day of that period.

3. As long as a community water system exceeds the action level, it must repeat the activities pursuant to subsection (B)(2) of this section as described in subsections (B)(3)(a) through (d) of this section.

   a. a community water system shall repeat the tasks contained in subsection (B)(2)(a), (b), (f) of this section every 12 months.

   b. A community water system shall repeat the tasks contained in subsection (B)(2)(c) of this section with each billing cycle.

   c. A community water system serving a population greater than 100,000 shall post and retain material on a publicly accessible Web site pursuant to subsection (B)(2)(d) of this section.

   d. The community water system shall repeat the task in subsection (B)(2)(e) of this section twice every 12 months on a schedule agreed upon with the Director. The Director can allow activities in subsection (B)(2) of this section to extend beyond the 60-day requirement if needed for implementation purposes on a case-by-case basis; however, this extension must be approved in writing by the Director in advance of the 60-day deadline.

4. Within 60 days after the end of the sampling period in which the exceedance occurred (unless it already is repeating public education tasks pursuant to subsection (B)(5) of this section), a non-transient non-community water system shall deliver the public education materials specified by subsection (A) of this section as follows:

   a. Post informational posters on lead in drinking water in a public place or common area in each of the buildings served by the system; and

   b. Distribute informational pamphlets and/or brochures on lead in drinking water to each person served by the non-transient non-community water system. The Director may allow the system to utilize electronic transmission in lieu of or combined with printed materials as long as it achieves at least the same coverage.

   c. For systems that are required to conduct sampling annually or less frequently, the end of the sampling period is September 30th of the calendar year in which the sampling occurs, or, if the Director has established an alternate sampling period, the last day of that period.

5. A non-transient non-community water system shall repeat the tasks contained in subsection (B)(4) of this section at least once during each calendar year in which the system exceeds the lead action level. The 60-day requirement of subsection (B)(4) may be extended if needed for implementation purposes; however, this extension must be approved in writing by the Director in advance of the 60-day deadline.

6. A water system may discontinue delivery of public education materials if the system has met the lead action level during the most recent six-month sampling period conducted

pursuant to § 704. Such a system shall recommence public education in accordance with this section if it subsequently exceeds the lead action level during any sampling period.

7. A community water system may apply to the Director, in writing (unless the Director has waived the requirement for prior Director-approval), to use only the text specified subsection (A)(1) of this section in lieu of the text in subsections (A)(1) and (A)(2) of this section and to perform the tasks listed in subsection (B)(4) and (B)(5) of this section in lieu of the tasks in subsection (B)(2) and (B)(3) of this section if:

   a. The system is a facility, such as a prison or a hospital, where the population served is not capable of or is prevented from making improvements to plumbing or installing point of use treatment devices; and

   b. The system provides water as part of the cost of services provided and does not separately charge for water consumption.

8. A community water system serving 3,300 or fewer people may limit certain aspects of their public education programs as follows:

   a. With respect to the requirements of subsection (B)(2)(f) of this section, a system serving 3,300 or fewer must implement at least one of the activities list in that subsection.

   b. With respect to the requirements of subsection (B)(2)(b) of this section, a system serving 3,300 or fewer people may limit the distribution of the public education materials required under that subsection to facilities and organizations served by the system that are most likely to be visited regularly by pregnant women and children.

   c. With respect to the requirements of subsection (B)(2)(e) of this section, the Director may waive this requirement for systems serving 3,300 or fewer persons as long as system distributes notices to every household served by the system.

C. Supplemental sampling and notification of results. A water system that fails to meet the lead action level on the basis of tap samples collected in accordance with § 704 shall offer to sample the tap water of any customer who requests it. The system is not required to pay for collecting or analyzing the sample, nor is the system required to collect and analyze the sample itself.

D. Notification of results

1. Reporting requirement. All water systems must provide a notice of the individual tap results from the lead tap water sampling carried out under the requirements of §704 to the persons served by the water system at the specific sampling site from which the sample was taken (e.g., the occupants of the residence where the tap was tested).

2. Timing of notification. A water system must provide the consumer notice as soon as practical, but no later than 30 days after the system learns of the tap sampling results.

3. Content. The consumer notice must include the results of lead tap water sampling for the tap that was tested, an explanation of the health effects of lead, list steps consumers can take to reduce exposure to lead in drinking water and contact information for the water utility. The notice must also provide the maximum contaminant level goal and the action level for lead and the definitions for these two terms from § 104.

4. Delivery. The consumer notice must be provided to persons served at the tap that was tested, either by mail or by another method approved by the Director. For example, upon approval by the Director, a non-transient non-community water system could post the results on a bulletin board in the facility to allow users to review the information. The system must provide the notice to customers at sample taps tested, including consumers who do not receive water bills.

§ 712 REPORTING REQUIREMENTS

All CWSS or NTNCWSS s shall report all of the following information to the Director in accordance with this section.

A. Reporting requirements for tap water sampling for lead and copper and for water quality parameter sampling.

1. Except as provided in subsection (A)(1) (h) of this section, a water system shall report the information specified below for all tap water samples specified in § 704 and for all water quality parameter samples specified in § 707 within the first 10 days following the end of each applicable ~~monitoring~~sampling period specified in §§ 704 and 707 (i.e., every six months, annually, every 3 years, or every 9 years)~~:~~.

a. The results of all tap samples for lead and copper including the location of each site and the criteria under § 704(A)(3), (4), (5), (6), and/or (7) under which the site was selected for the public water system's sampling pool;

b. Documentation for each tap water lead or copper sample for which the water system requests invalidation pursuant to § 704(F)(2);

c. [Reserved];

d. The 90th percentile lead and copper concentrations measured from among all lead and copper tap water samples collected during each sampling period (calculated in accordance with § 703(A)(3), unless the Director calculates the water system's 90th percentile lead and copper levels under subsection (H) of this section);

e. With the exception of initial tap sampling conducted pursuant to § 704 (D)(2), the public water system shall designate any site which was not sampled during previous sampling periods, and include an explanation of why sampling sites have changed;

f. The results of all tap samples for pH, and where applicable, alkalinity, calcium, conductivity, temperature, and orthophosphate or silica collected under § 707(B) - (E);

g. The results of all samples collected at the entry point(s) to the distribution system for applicable water quality parameters under § 707(B) - (E);

h. A water system shall report the results of all water quality parameter samples collected under § 707(C)-(F) during each six-month ~~monitoring~~sampling period specified in § 707(D) within the first 10 days following the end of the ~~monitoring~~sampling period unless the Director has specified a more frequent reporting requirement.

2. For a NTNCWS, or a CWS meeting the criteria of § 711(C)(7)(a) and (b), that does not have enough taps that can provide first-draw samples, the water system must either:

a. Provide written documentation to the Director identifying standing times and locations for enough non-first-draw samples to make up its sampling pool under § 704(B)(5) by the start of the first applicable ~~monitoring~~sampling period under § 704(D) that commences after promulgation of these regulations, unless the Director has waived prior Director- approval of non-first-draw sample sites selected by the water system pursuant to § 704(B)(5); or

b. If the Director has waived prior approval of non-first-draw sample sites selected by the water system, identify, in writing, each site that did not meet the six-hour minimum standing time and the length of standing time for that particular substitute sample collected pursuant to § 704(B)(5) and include this information with the lead and copper tap sample results required to be submitted pursuant to subsection (A)(1)(i) of this section.

3. ~~No later than 60 days after the addition of a new source or any change in water treatment, unless the Director requires earlier notification, a water system deemed to have optimized corrosion control under § 706(B)(3), a water system subject to reduced monitoring pursuant to § 704 (D)(5), or a water system subject to a monitoring waiver pursuant to § 704(G), shall send written documentation to the Director describing the change. In those instances where prior Director approval of the treatment change or new source is not required, water systems are encouraged to provide the notification to the Director beforehand to minimize the risk the treatment change or new source will adversely affect optimal corrosion control.~~

At a time specified by the Director, or if no specific time is designated by the Director, then as early as possible prior to the addition of a new source or any long-term change in water treatment, a water system deemed to have optimized corrosion control under §706(B)(3), or a water system subject to a sampling waiver pursuant to § 704(G), shall submit written documentation to the Director describing the change or addition. The Director must review and approve the addition of a new source or long-term change in treatment before it is implements by the water system. Examples of long-term treatment changes include the addition of a new treatment process or modification of an existing treatment process. Examples of modifications include switching secondary disinfectants, switching coagulants (e.g., alum to ferric chloride), and switching corrosion inhibitor products (e.g., orthophosphate to blended phosphate). Long-term changes can include dose changes to existing chemicals if the system is planning long-term changes to its finished water pH or residual inhibitor concentration. Long-term treatment changes would not include chemical dose fluctuations associated with daily raw water quality changes.

4. Any small water system applying for a ~~monitoring~~sampling waiver under § 704(G), or subject to a waiver granted pursuant to § 704(G)(3), shall provide the following information to the Director in writing by the specified deadline:

a. By the start of the first applicable ~~monitoring~~sampling period in § 704(D), any small water system applying for a ~~monitoring~~sampling waiver shall provide the documentation required to demonstrate that it meets the waiver criteria of §§ 704(G)(1) and (2).

b. No later than nine years after the ~~monitoring~~sampling previously conducted pursuant to §704(G)(2) or §704(G)(4)(a), each small water system desiring to maintain its ~~monitoring~~sampling waiver shall provide the information required by §704(G)(4)(a) and (b).

c. No later than 60 days after it becomes aware that it is no longer free of lead-containing and/or copper-containing material, as appropriate, each small water system with a ~~monitoring~~sampling waiver shall provide written notification to the Director, setting forth the circumstances resulting in the lead-containing and/or copper-containing materials being introduced into the water system and what corrective action, if any, the water system plans to remove these materials.

d. By October 10, 2000, any small water system with a waiver granted prior to the promulgation of these regulations and that has not previously met the requirements of § 704(G)(2) shall provide the information required by that subsection.

5. Each ground water system that limits water quality parameter ~~monitoring~~sampling to a subset of entry points under § 707(C)(3) shall provide, by the commencement of such ~~monitoring~~sampling, written correspondence to the Director that identifies the selected entry points and includes information sufficient to demonstrate that the sites are representative of water quality and treatment conditions throughout the water system.

B. Source water sampling reporting requirements.

1. A public water system shall report the sampling results for all source water samples collected in accordance with § 708 within the first 10 days following the end of each source water sampling period (i.e., annually, per compliance period, per compliance cycle) specified in § 708.

2. With the exception of the first round of source water sampling conducted pursuant to § 708(B), the water system shall specify any site which was not sampled during previous sampling periods, and include an explanation of why the sampling point has changed.

C. Corrosion control treatment reporting requirements. By the applicable dates under § 706, public water systems shall report the following information:

1. For public water systems demonstrating that they have already optimized corrosion control, information required in § 706(B)(2) or (3).

2. For public water systems required to optimize corrosion control, their recommendation regarding optimal corrosion control treatment under § 705(A).

3. For public water systems required to evaluate the effectiveness of corrosion control treatments under § 705(C), the information required by that subsection.

4. For public water systems required to install optimal corrosion control designated by the Director under § 705(D), a letter certifying that the public water system has completed installing that treatment.

D. Source water treatment reporting requirements. By the applicable dates in § 709, public water systems shall provide the following information to the Director:

1. If required under § 709(B)(1), their recommendation regarding source water treatment;

2. For public water systems required to install source water treatment under § 709(B)(2), a letter certifying that the public water system has completed installing the treatment designated by the Director within 24 months after the Director designated the treatment.

E. Lead service line replacement reporting requirements. Public water systems shall report the following information to the Director to demonstrate compliance with the requirements of § 710:

1. ~~Within 12 months after a public water system exceeds the lead action level in sampling referred to in § 710(A), the public water system shall demonstrate in writing to the Director that it has conducted a material evaluation, including the evaluation in § 704(A), to identify the initial number of lead service lines in its distribution system, and shall provide the Director with the public water system's schedule for replacing annually at least 7 % of the initial number of lead service lines in its distribution system.~~

No later than 12 months after the end of a sampling period in which a system exceeds the lead action level in sampling referred to in § 710(A), the system must submit written documentation to the Director of the material evaluation conducted as required in § 704(A), identify the initial number of lead service lines in its distribution system at the time the system exceeds the lead action level, and provide the system's schedule for annually replacing at least 7 percent of the initial number of lead services lines in its distribution system.

2. ~~Within 12 months after a public water system exceeds the lead action level in sampling referred to in § 710(A), and every 12 months thereafter, the public water system shall demonstrate to the Director in writing that the public water system has either:~~

No later than 12 months after the end of a sampling period in which a system exceeds the lead action level in sampling referred to in § 710(A), and every 12 months thereafter, the system shall demonstrate to the Director in writing that the system has either:

a. Replaced in the previous 12 months at least 7 % of the initial lead service lines (or a greater number of lines specified by the Director under §710 (E)) in its distribution system, or;

b. Conducted sampling which demonstrates that the lead concentration in all service lines samples from an individual line(s), taken pursuant to § 704(B)(3), is less than or equal to 0.015 mg/L. In such cases, the total number of lines replaced and/or which meet the criteria in § 710(C) shall equal at least 7 % of the initial number of lead lines identified under subsection (A) of this section (or the percentage specified by the Director under § 710(E)).

3. The annual letter submitted to the Director under subsection (E)(2) of this section shall contain the following information:

a. The number of lead service lines scheduled to be replaced during the previous year of the public water system's replacement schedule;

b. The number and location of each lead service line replaced during the previous year of the public water system's replacement schedule;

c. If measured, the water lead concentration and location of each lead service line sampled, the sampling method, and the date of sampling.

4. Any water system which collects lead service line samples following partial lead service line replacement required by §710 shall report the results to the Director within the first ten days of the month following the month in which the water system receives the laboratory results, or as specified by the Director. The Director may eliminate this requirement to report these ~~monitoring~~sampling results. Water systems shall also report any additional information as specified by the Director, and in a time and manner prescribed by the Director, to verify that all partial lead service line replacement activities have taken place.

F. Public education program reporting requirements.

1. Any water system that is subject to the public education requirements in § 711 shall, within ten days after the end of each period in which the water system is required to perform public education ~~tasks~~ in accordance with §711(C), send written documentation to the Director that contains:

a. A demonstration that the ~~water~~ system has delivered the public education materials that meet the content requirements in § 711(A) ~~and (B)~~ and the delivery requirements in § 711~~(C)~~ (B); and

b. A list of all the newspapers, radio stations, television stations, and facilities and organizations to which the water system delivered public education materials during the period in which the water system was required to perform public education tasks.

2. Unless required by the Director, a water system that previously has submitted the information required by subsection (F)(1)(b) of this section need not resubmit the information required by subsection (F)(1)(b) of this section, as long as there have been no changes in the distribution list and the water system certifies that the public education materials were distributed to the same list submitted previously.

3. No later than 3 months following the end of the sampling period, each system must mail a sample copy of the consumer notification of tap results to the Director along with a

certification that the notification has been distributed in a manner consistent with the requirements of § 711(D).

G. Reporting of additional sampling data. Any CWS or NTNCWS which collects sampling data in addition to that required by this part shall report the results to the Director within the first ten days following the end of the applicable sampling period under §§ 704, 707, and 708 during which the samples are collected.

H. Reporting of 90th percentile lead and copper concentrations where the Director calculates a water system's 90th percentile concentrations. A water system is not required to report the 90th percentile lead and copper concentrations measured from among all lead and copper tap water samples collected during each ~~monitoring~~sampling period, as required by subsection (A)(1) (d) of this section if:

1. The Director has previously notified the water system that it will calculate the water system's 90th percentile lead and copper concentrations, based on the lead and copper tap results submitted pursuant to subsection (H)(2) (a) of this section, and has specified a date before the end of the applicable ~~monitoring~~sampling period by which the water system must provide the results of lead and copper tap water samples;

2. The water system has provided the following information to the Director by the date specified in subsection (H)(1) of this section:

   a. The results of all tap samples for lead and copper including the location of each site and the criteria under § 704(A)(3), (4), (5), (6), and/or (7) under which the site was selected for the water system's sampling pool, pursuant to subsection (A)(1)(a) of this section; and

   b. An identification of sampling sites utilized during the current ~~monitoring~~sampling period that were not sampled during previous ~~monitoring~~sampling periods, and an explanation why sampling sites have changed; and

3. The Director has provided the results of the 90th percentile lead and copper calculations, in writing, to the water system before the end of the ~~monitoring~~sampling period.

§ 713 RECORDKEEPING REQUIREMENTS

Any CWS or NTNCWS subject to the requirements of this part, Part VII-Lead and Copper, shall retain on its premises original records of all sampling data and analyses, reports, surveys, letter, evaluations, schedules, Director-determinations, and any other information required by § 706 through § 708. Each public water system shall retain the records required by this section for no fewer than 12 years.

Part XII
CONSUMER CONFIDENCE REPORTS

§ 1201 PURPOSE

This part establishes the minimum requirements for the content of annual reports, called "Consumer Confidence Reports" that Community Water Systems (CWSs) must deliver to their customers. These reports must contain information on the quality of the water delivered by the systems and characterize the risks (if any) from exposure to contaminants detected in the drinking water in an accurate and understandable manner. Appendix F provides suggested value conversions, regulated contaminants and language for preparing Consumer Confidence Reports. References in this part to section numbers are to the NNPDWR, unless otherwise indicated.

§ 1202 APPLICABILITY

A. Notwithstanding the provisions of §107, this part applies only to CWSs.

B. For the purposes of this part, customers are defined as billing units or service connection to which water is delivered by a community water system.

C. For the purposes of this part, detected means: At or above the levels prescribed by § 405 (C) for inorganic contaminants, at or above the levels prescribed by § 409 (F)for the contaminants listed in § 204 (A)(1), at or above the levels prescribed by § 410 (C)(2) for the contaminants listed in § 204 (A)(2), at or above the levels prescribed by Appendix E-1101-E (B)(2)(d) for the contaminants or contaminant groups listed in §207, and at or above the levels prescribed by § 411 (B) for radioactive contaminants.

§ 1203 EFFECTIVE DATES

A. The regulations in this part shall take effect upon approval by the Navajo Nation Resources Committee.

B. Each existing CWS must deliver its first report pursuant to these regulations by July 1, 2003, and subsequent reports by July 1 annually thereafter. The first report must contain data collected during or prior to calendar year 2003 as prescribed in § 1204(D)(3). Each report thereafter must contain data collected during or prior to the previous calendar year.

C. A new CWS must deliver its first report by July 1 of the year after its first full calendar year in operation and annually thereafter.

D. A CWS that sells water to another CWS must deliver the applicable information required in § 1204 to the consecutive system:

1. no later than April 1, 2003, and by April 1 annually thereafter; or

2. on a date mutually agreed upon by the seller and the purchaser, and specifically included in a contract between the parties.

§ 1204 CONTENTS OF THE REPORTS

A. Each CWS must provide to its customers an annual report that contains the information specified in this section and § 1205.

B. Information on the source of the water delivered.

1. Each report must identify the source(s) of the water delivered by the CWS by providing information on:

a. The type of the water source: e.g., surface water, ground water; and

b. The commonly used name (if any) and location of the body (or bodies) of water.

2. If a source water assessment has been completed, the report must notify consumers of the availability of this information and the means to obtain it. In addition, systems are encouraged to highlight in the report significant sources of contamination in the source water area if they have readily available information. Where a system has received a source water assessment from the PWSSP, the report must include a brief summary of the system's susceptibility to potential sources of contamination, using language provided by the PWSSP or written by the operator.

C. Definitions.

1. Each report must include the following definitions:

   a. Maximum Contaminant Level Goal or MCLG: The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.

   b. Maximum Contaminant Level or MCL: The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.

2. A report for a CWS operating under a variance or an exemption issued under §§ 601, 602 or 603 of the Navajo Nation Safe Drinking Water Act must include the following definition: Variances and Exemptions: PWSSP or EPA permission not to meet a MCL or a treatment technique under certain conditions.

3. A report that contains data on contaminants that EPA regulates using any of the following terms must include the applicable definitions:

   a. Treatment Technique: A required process intended to reduce the level of a contaminant in drinking water.

   b. Action Level: The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.

   c. Maximum residual disinfectant level goal or MRDLG: The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

   d. Maximum residual disinfectant level or MRDL: The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

D. Information on Detected Contaminants.

1. This subsection specifies the requirements for information to be included in each report for contaminants subject to mandatory monitoring (except Cryptosporidium). It applies to:

   a. Contaminants subject to a MCL, action level, maximum residual disinfectant level, or treatment technique (regulated contaminants).

2. The data relating to these contaminants must be displayed in one table or in several adjacent tables. Any additional monitoring results which a CWS chooses to include in its report must be displayed separately.

3. The data must be derived from data collected to comply with EPA and PWSSP monitoring and analytical requirements during calendar year 2002 for the first report and subsequent calendar years thereafter, except that:

   a. Where a system is allowed to monitor for regulated contaminants less often than once a year, the table(s) must include the date and results of the most recent sampling and the report must include a brief statement indicating that the data presented in the report are from the most recent testing done in accordance with the regulations. No data older than 5 years need be included.

4. For detected regulated contaminants (listed in Appendix F to these regulations), the table(s) must contain:

   a. The MCL for that contaminant expressed as a number equal to or greater than 1.0 (as provided in Appendix F to these regulations);

   b. The MCLG for that contaminant expressed in the same units as the MCL;

   c. If there is no MCL for a detected contaminant, the table must indicate that there is a treatment technique, or specify the action level, applicable to that contaminant, and the report must include the definitions for treatment technique and/or action level, as appropriate, specified in paragraph(C)(3) of this section;

   d. For contaminants subject to a MCL, except turbidity and total coliforms, the highest contaminant level used to determine compliance with a NNPDWR and the range of detected levels, as follows:

i. When compliance with the MCL is determined annually or less frequently: the highest detected level at any sampling point and the range of detected levels expressed in the same units as the MCL.

ii. When compliance with the MCL is determined by calculating a running annual average of all samples taken at a sampling point: the highest average of any of the sampling points and the range of all sampling points expressed in the same units as the MCL. For the MCLs for TTHM and HAA5 in §207(B)(2), systems must include the highest locational running annual average for TTHM and HAA5 and the range of individual sample results for all sampling points expressed in the same units as the MCL. If more than one location exceeds the TTHM or HAA5 MCL, the systems must include the locational running annual averages for all locations that exceed the MCL.

iii. When compliance with the MCL is determined on a system-wide basis by calculating a running annual average of all samples at all sampling points: the average and range of detection expressed in the same units as the MCL. The system is required to include individual sample results for the IDSE conducted under Part XXII of these regulations when determining the range of TTHM and HAA5 results to be reported in the annual consumer confidence report for the calendar year that the IDSE samples were taken.

Note to paragraph (D)(4)(d): When rounding of results to determine compliance with the MCL is allowed by the regulations, rounding should be done prior to multiplying the results by the factor listed in Appendix F of these regulations.

e. For turbidity.

i. When it is reported pursuant to § 206: the highest average monthly value.

ii. When it is reported pursuant to the requirements of § 803: the highest monthly value. The report should include an explanation of the reasons for measuring turbidity.

iii. When it is reported pursuant to § 805, § 1305 or §2106(B): the highest single measurement and the lowest monthly percentage of samples meeting the turbidity limits specified in § 805, or § 1305 or §2106(B) for the filtration technology being used. The report should include an explanation of the reasons for measuring turbidity.

f. For lead and copper: the 90^{th} percentile value of the most recent round of sampling and the number of sampling sites exceeding the action level.

g. For total coliform:

i. The highest monthly number of positive samples for systems collecting fewer than 40 samples per month; or

ii. The highest monthly percentage of positive samples for systems collecting at least 40 samples per month.

h. For fecal coliform: the total number of positive samples.

i. The likely source(s) of detected contaminants to the best of the operator's knowledge. Specific information regarding contaminants may be available in sanitary surveys and source water assessments, and should be used when available to the operator. If the operator lacks specific information on the likely source, the report must include one or more of the typical sources for that contaminant listed in Appendix F that is most applicable to the system.

5. If a CWS distributes water to its customers from multiple hydraulically independent distribution systems that are fed by different raw water sources, the table should contain a separate column for each service area and the report should identify each separate distribution system. Alternatively, systems could produce separate reports tailored to include data for each service area.

6. The table(s) must clearly identify any data indicating violations of MCLs, MRDLs, or treatment techniques and the report must contain a clear and readily understandable explanation of the violation including: the length of the violation, the potential adverse health effects, and actions taken by the system to address the violation. To describe the potential health effects, the system must use the relevant language of Appendix F.

7. For detected unregulated contaminants for which monitoring is required (except Cryptosporidium), the table(s) must contain the average and range at which the contaminant was detected. The report may include a brief explanation of the reasons for monitoring for unregulated contaminants.

E. Information on Cryptosporidium, radon, and other contaminants.

1. If the system has performed any monitoring for *Cryptosporidium*, including monitoring performed to satisfy the requirements of 40 CFR § 141.143, which indicates that *Cryptosporidium* may be present in the source water or the finished water, the report must include:

   a. A summary of the results of the monitoring; and

   b. An explanation of the significance of the results.

2. If the system has performed any monitoring for radon which indicates that radon may be present in the finished water, the report must include:

   a. The results of the monitoring; and

   b. An explanation of the significance of the results.

3. If the system has performed additional monitoring which indicates the presence of other contaminants in the finished water, NNEPA strongly encourages systems to report any results which may indicate a health concern. To determine if results may indicate a health concern, NNEPA recommends that systems find out if EPA or NNEPA has proposed a NPDWR or a NNPDWR, respectively, or issued a health advisory for that contaminant by calling the PWSSP at (928) 871-7755 and/or the EPA Safe Drinking Water hotline at (800) 426-4791. NNEPA considers detects above a proposed MCL or health advisory level to indicate possible health concerns. For such contaminants, NNEPA recommends that the report include:

   a. The results of the monitoring; and

   b. An explanation of the significance of the results noting the existence of a health advisory or a proposed regulation.

F. Compliance with NNPDWR. In addition to the requirements of paragraph (D)(6), the report must note any violation that occurred during the year covered by the report of a requirement listed below, and include a clear and readily understandable explanation of the violation, any potential adverse health effects, and the steps the system has taken to correct the violation.

1. Monitoring and reporting of compliance data;

2. Filtration and disinfection prescribed by Part VIII-General Requirements for Surface Water Treatment. For systems which have failed to install adequate filtration or disinfection equipment or processes, or have had a failure of such equipment or processes which constitutes a violation, the report must include the following language as part of the explanation of potential adverse health effects: "Inadequately treated water may contain disease-causing organisms. These organisms include bacteria, viruses, and parasites which can cause symptoms such as nausea, cramps, diarrhea, and associated headaches."

3. Lead and copper control requirements prescribed by Part VII (Lead and Copper). For systems that fail to take one or more actions prescribed by §§ 704(B), 705, 706, 707, or 708, the report must include the applicable language of Appendix F for lead, copper, or both.

4. Treatment techniques for Acrylamide and Epichlorohydrin prescribed by Part X-Treatment Techniques. For systems that violate the requirements of Part X, the report must include the relevant language from Appendix F.

5. Recordkeeping of compliance data.

6. Violation of the terms of a variance, an exemption, or an administrative or judicial order.

G. Variances and Exemptions. If a system is operating under the terms of a variance or an exemption issued under §§ 601, 602 or 603 of Navajo Nation Safe Drinking Water Act, the report must contain:

1. An explanation of the reasons for the variance or exemption;

2. The date on which the variance or exemption was issued;

3. A brief status report on the steps the system is taking to install treatment, find alternative sources of water, or otherwise comply with the terms and schedules of the variance or exemption; and

4. A notice of any opportunity for public input in the review, or renewal, of the variance or exemption.

H. Additional information

1. The report must contain a brief explanation regarding contaminants that may reasonably be expected to be found in drinking water, including bottled water. This explanation may include the language of paragraphs (H)(1)(a) through © or systems may use their own comparable language. The report also must include the language of paragraph (H)(1)(d) of this section.

   a. The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally-occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity.

   b. Contaminants that may be present in source water include:

      I. Microbial contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.

      ii. Inorganic contaminants, such as salts and metals, which can be naturally-occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.

      iii. Pesticides and herbicides, which may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses.

      iv. Organic chemical contaminants, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff, and septic systems.

      v. Radioactive contaminants, which can be naturally-occurring or be the result of oil and gas production and mining activities.

   c. In order to ensure that tap water is safe to drink, NNEPA prescribes regulations which limit the amount of certain contaminants in water provided by public water systems. Food and Drug Administration (FDA) regulations establish limits for contaminants in bottled water which must provide the same protection for public health.

   d. Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the PWSSP at (928) 871-7755.

2. The report must include the telephone number of the owner, operator, or designee of the CWS as a source of additional information concerning the report.

3. The report must contain information in the Navajo language regarding the importance of the report or contain a telephone number or address and a statement in Navajo that residents may contact the system at that number or address to obtain a translated copy of the report or assistance with a Navajo interpretation of the report.

4. The report must include information (e.g., time and place of regularly scheduled board or chapter meetings) about opportunities for public participation in decisions that may affect the quality of the water.

5. The systems may include such additional information as they deem necessary for public education consistent with, and not detracting from, the purpose of the report.

6. Systems required to comply with Part XXV.

a. Any groundwater system that receives notice from the Director of a significant deficiency or notice from a laboratory of a fecal indicator-positive groundwater source sample that is not invalidated by the Director under §2503(D) must inform its customers of any significant deficiency that is uncorrected at the time of the next report or of any fecal indicator-positive groundwater source sample in the next report. The system must continue to inform the public annually until the Director determines that particular significant deficiency is corrected or the fecal contamination in the groundwater source is addressed under §2504(A). Each report must include the following elements.

1. The nature of the particular significant deficiency or the source of the fecal contamination (if the source is known) and the date the significant deficiency was identified by the Director of the dates of the fecal indicator-positive groundwater source samples.

2. If the fecal contamination in the groundwater source has been addressed under §2504(A) and the date of such action;

3. For each significant deficiency or fecal contamination in the groundwater source that has not been addressed under §2504(A), the Director-approved plan and schedule for correction, including interim measures, progress to date and any interim measures completed; and

4. If the system receives notice of a fecal indicator-positive groundwater source sample that is not invalidated by the Director under §2503©, the potential health effects using the health effects language of Appendix F.

b. If directed by the Director, a system with significant deficiencies that have been corrected before the next report is issued must inform its customers of the significant deficiency, how the deficiency was corrected and the data of correction under §(H)(6)(A) of this section.

§ 1205 REQUIRED ADDITIONAL HEALTH INFORMATION

A. All reports must prominently display the following language:

"Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the Safe Drinking Water Hotline (800-426-4791)."

B. Ending in the report due by July 1, 2001, a system which detects arsenic at levels above 0.025 mg/L, but below the 0.05 mg/L, and beginning in the report due by July 1, 2002, a system that detects arsenic above 0.005 mg/L and up to and including 0.010 mg/L:

1. Must include in its report a short informational statement about arsenic, using language such as: "While your drinking water meets EPA's standard for arsenic, it does contain low levels of arsenic. EPA's standard balances the current understanding of arsenic's possible health effects against the costs of removing arsenic from drinking water. EPA continues to research the health effects of low levels of arsenic, which is a mineral known to cause cancer in humans at high concentrations and is linked to other health effects such as skin damage and circulatory problems."

2. May write its own educational statement, but only in consultation with the Director.

C. A system that detects nitrate at levels above 5 mg/L, but below the MCL:

1. Must include a short informational statement about the impacts of nitrate on children, using language such as: "Nitrate in drinking water at levels above 10 ppm is a health risk for infants of less than six months of age. High nitrate levels in drinking water can cause blue baby syndrome. Nitrate levels may rise quickly for short periods of time because of rainfall or agricultural activity. If you are caring for an infant you should ask advice from your health care provider."

2. May write its own educational statement, but only in consultation with the Director.

D. Systems that detect lead above the action level in more than 5%, and up to and including 10%, of homes sampled.

1. ~~Must include a short informational statement about the special impact of lead on children, using language such as: "Infants and young children are typically more vulnerable to lead in drinking water than the general population. It is possible that lead levels at your home may be higher than at other homes in the community as a result of materials used in your home's plumbing. If you are concerned about elevated lead levels in your home's water, flush your tap for 30 seconds to 2 minutes before using tap water. Additional information is available from the Safe Drinking Water Hotline (800-426-4791) or the PWSSP at (928) 871-7755."~~ Every report must include the following lead specific information: A short informational statement about lead in drinking water and its effects on children. The statement must include the following:

   If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. [NAME OF UTILITY] is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at http://www.epa/gov/safewater/lead.

2. May write its own educational statement, but only in consultation with the Director.

E. CWSs that detect TTHM above 0.080 mg/L, but below the MCL in § 207~~210~~, as an annual average, monitored and calculated under the provisions of § 1104~~413~~, must include health effects language for TTHMs prescribed by Appendix F.

F. Beginning in the report due by July 1, 2002 and ending January 22, 2006, a CWS that detects arsenic above 0.010 mg/L and up to and including 0.05

mg/L must include the arsenic health effects language prescribed by Appendix F.

§ 1206 REPORT DELIVERY AND RECORDKEEPING

A. Except as provided in subsection (G) of this section, each CWS must mail or otherwise directly deliver one copy of the report to each customer.

B. The system must make a good faith effort to reach consumers who do not get water bills, using means recommended by the Director. NNEPA expects that an adequate good faith effort will be tailored to the consumers who are served by the system but are not bill-paying customers, such as renters or workers. A good faith effort to reach consumers would include a mix of methods appropriate to the particular system, such as: Posting the reports on the Internet; mailing to postal patrons; advertising the availability of the report in the news media; publication in a local newspaper; posting in public places such as cafeterias or lunch rooms of public buildings; delivery of multiple copies for distribution by single-biller customers such as apartment buildings or large private employers; delivery to community, including chapter, organizations.

C. No later than the date the system is required to distribute the report to its customers, each CWS must mail a copy of the report to the Director, followed within 3 months by a certification that the report has been distributed to customers, and that the information is correct and consistent with the compliance monitoring data previously submitted to the Director.

D. No later than the date the system is required to distribute the report to its customers, each CWS must deliver the report to any other agency or clearinghouse identified by the Director.

E. Each CWS must make its reports available to the public upon request.

F. The Director may waive the requirement of subsection (A) of this section for CWSs serving fewer than 10,000 persons. Written requests to the Director must be made and the determination will be sent to the CWS owner/operator.

1. Such systems must:

   a. Publish the reports in one or more local newspapers serving the area in which the system is located;

b. Inform the customers that the reports will not be mailed, either in the newspapers in which the reports are published or by other means approved by the Director; and

c. Make the reports available to the public upon request.

2. Systems serving 500 or fewer persons may forego the requirements of paragraphs (F)(1)(a) and (b) of this section if they provide notice at least once per year to their customers by mail, door-to-door delivery or by posting in an appropriate location that the report is available upon request.

G. Any system subject to this part must retain copies of its Consumer Confidence Report for no fewer than 3 years.

Part XIII
ENHANCED SURFACE WATER TREATMENT

§ 1301 APPLICABILITY

The requirements of this part constitute a primary drinking water regulation. These regulations establish requirements for filtration and disinfection that are in addition to criteria under which filtration and disinfection are required under Part VIII - General Requirements for Surface Water Treatment. The requirements of this part are applicable to Part VIII systems serving at least 10,000 people, beginning January 01, 2002 unless otherwise specified in this part.

§ 1302 GENERAL REQUIREMENTS

A. The regulations in this part establish or extend treatment technique requirements in lieu of maximum contaminant levels for the following contaminants: *Giardia lamblia*, viruses, heterotrophic plate count bacteria, *Legionella*, *Cryptosporidium*, and turbidity.

B. Each Part VIII systems serving at least 10,000 people must provide treatment of its source water that complies with these treatment technique requirements and is in addition to those requirements identified in §§ 801 and 802.

C. The treatment technique requirements consist of installing and properly operating water treatment processes which reliably achieve:

1. At least 99 percent (2-log) removal of *Cryptosporidium* between a point where the raw water is not subject to re-contamination by surface water runoff and a point downstream before or at the first customer for filtered water systems, or *Cryptosporidium* control under the watershed control plan for unfiltered water systems.

2. Compliance with the profiling and benchmark requirements under the provisions of § 1304.

D. A public water system subject to the requirements of this part is considered to be in compliance with the requirements of paragraphs (A)-(C) of this section if:

1. It meets the requirements for avoiding filtration in §§ 803 and § 1303 and the disinfection requirements in §§ 804 and 1304; or

2. It meets the applicable filtration requirements in either § 805 or § 1305 and the disinfection requirements in §§ 804 and 1304.

E. Systems will not be permitted to begin construction of uncovered finished water storage facilities. The provisions for the review of the design and construction of public water systems, including the final inspection prior to operation, are addressed in § 1500 of these regulations.

F. Part VIII systems that did not conduct optional monitoring under § 1304 because they served fewer than 10,000 persons when such monitoring was required, but serve more than 10,000 persons prior to January 14, 2005 must comply with §§ 1301, 1302, 1303, 1305, 1306, and 1307. These systems must also consult with the Director to establish a disinfection benchmark. A public water system that decides to make a significant change to its disinfection practice, as described in § 1304 (C)(1)(a) through (d) must consult with the Director prior to making such change.

§ 1303 CRITERIA FOR AVOIDING FILTRATION

In addition to the requirements of § 803, a public water system subject to the requirements of this part that does not provide filtration must meet all of the conditions of paragraphs (A) and (B) of this section.

A. Site-specific conditions. In addition to site-specific conditions in § 803(B), systems must maintain the watershed control program under § 803(B)(2) to minimize the potential for contamination by *Cryptosporidium oocysts* in the source water. The watershed control program must, for *Cryptosporidium:*

1. Identify watershed characteristics and activities which may have an adverse effect on source water quality; and

2. Monitor the occurrence of activities which may have an adverse effect on source water quality.

B. During the onsite inspection conducted under the provisions of § 803(B)(3), the Director must determine whether the watershed control program established under § 803(B)(2) is adequate to

limit potential contamination by *Cryptosporidium oocysts*. The adequacy of the program must be based on the comprehensiveness of the watershed review; the effectiveness of the water system's program to monitor and control detrimental activities occurring in the watershed; and the extent to which the water system has maximized land ownership and/or controlled land use within the watershed.

§ 1304 DISINFECTION PROFILING AND BENCHMARKING

A. Determination of systems required to profile. A public water system subject to the requirements of this part must determine its TTHM annual average using the procedure in subsection (A)(1) of this section and its HAA5 annual average using the procedure in subsection (A)(2) of this section. The annual average is the arithmetic average of the quarterly averages of four consecutive quarters of monitoring.

1. The TTHM annual average must be the annual average during the same period as is used for the HAA5 annual average.

   a. Those water systems that collected data under the provisions of the Information Collection Rule must use the results of the samples collected during the last four quarters of required monitoring under 40 CFR § 141.142.

   b. Those systems that use "grandfathered" HAA5 occurrence data that meet the provisions of subsection (A)(2)(b) of this section must use TTHM data collected at the same time under the provisions of §§ 210 and 413.

   c. Those systems that use HAA5 occurrence data that meet the provisions of subsection (A)(2)(c)(i) of this section must use TTHM data collected at the same time under the provisions of §§ 210 and 413.

2. The HAA5 annual average must be the annual average during the same period as is used for the TTHM annual average.

   a. Those systems that collected data under the provisions of the Information Collection Rule must use the results of the samples collected during the last four quarters of required monitoring under 40 CFR § 141.142.

   b. Those systems that have collected four quarters of HAA5 occurrence data that meets the routine monitoring sample number and location requirements for TTHM in §§ 210 and 413 and handling and analytical method requirements of 40 CFR § 141.142(b)(1) may use those data to determine whether the requirements of this section apply.

   c. Those water systems that have not collected four quarters of HAA5 occurrence data that meets the provisions of either subsection (A)(2)(a) or (b) of this section must either:

      i. Conduct monitoring for HAA5 that meets the routine monitoring sample number and location requirements for TTHM in §§ 210 and 413 and handling and analytical method requirements of 40 CFR § 141.142(b)(1) to determine the HAA5 annual average and whether the requirements of subsection (B) of this section apply. This monitoring must be completed so that the applicability determination can be made; or

      ii. Comply with all other provisions of this section as if the HAA5 monitoring had been conducted and the results required compliance with subsection (B) of this section.

3. The system may request that the Director approve a more representative annual data set than the data set determined under subsection (A)(1) or (2) of this section for the purpose of determining applicability of the requirements of this section.

4. The Director may require that a system use a more representative annual data set than the data set determined under subsection (A)(1) or (2) of this section for the purpose of determining applicability of the requirements of this section.

5. The system must submit data to the Director on the schedule in subsections (A)(5)(a) through (e) of this section.

   a. Those systems that collected TTHM and HAA5 data under the provisions of the Information Collection Rule, as required by subsections (A)(1)(a) and (A)(2)(a) of this section, must submit the results of the samples collected during the last 12 months of required monitoring under 40 CFR § 141.142.

   b. Those systems that have collected four consecutive quarters of HAA5 occurrence data

that meets the routine monitoring sample number and location for TTHM in §§ 210 and 413 and handling and analytical method requirements of 40 CFR § 141.142(b)(1), as allowed by subsections (A)(1)(b) and (A)(2)(b) of this section, must submit those data to the Director. Until the Director has approved the data, the water system must conduct monitoring for HAA5 using the monitoring requirements specified under subsection (A)(2)(c) of this section.

c. Those systems that conduct monitoring for HAA5 using the monitoring requirements specified by subsections (A)(1)(c) and (A)(2)(c)(i) of this section, must submit TTHM and HAA5 data not later than March 31, 2000.

d. Those systems that elect to comply with all other provisions of this section as if the HAA5 monitoring had been conducted and the results required compliance with this section, as allowed under subsections (A)(2)(c)(ii) of this section, must notify the Director in writing of their election.

e. If the system elects to request that the Director approve a more representative annual data set than the data set determined under subsection (A)(2)(a) of this section, the water system must submit this request in writing.

6. Any system having either a TTHM annual average ≥0.064 mg/L or an HAA5 annual average ≥0.048 mg/L during the period identified in subsections (A)(1) and (2) of this section must comply with subsection (B) of this section.

B. Disinfection profiling.

1. Any system that meets the criteria in subsection (A)(6) of this section must develop a disinfection profile of its disinfection practice for a period of up to three years.

2. The system must monitor daily for a period of 12 consecutive calendar months to determine the total logs of inactivation for each day of operation, based on the $CT_{99.9}$ values in Appendix D - Tables 800-D-4 to 800-D-11, as appropriate, through the entire treatment plant. This water system must begin this monitoring not later than April 01, 2000, pursuant to 40 CFR §141.172(b)(2). As a minimum, the system with a single point of disinfectant application prior to entrance to the distribution system must conduct the monitoring in subsections (B)(2)(a) through (d) of this section. A system with more than one point of disinfectant application must conduct the monitoring in subsections (B)(2)(a) through (d) of this section for each disinfection segment. The system must monitor the parameters necessary to determine the total inactivation ratio, using analytical methods in Appendix D § 801-D(A), as follows:

a. The temperature of the disinfected water must be measured once per day at each residual disinfectant concentration sampling point during peak hourly flow.

b. If the system uses chlorine, the pH of the disinfected water must be measured once per day at each chlorine residual disinfectant concentration sampling point during peak hourly flow.

c. The disinfectant contact time(s) ("T") must be determined for each day during peak hourly flow.

d. The residual disinfectant concentration(s) ("C") of the water before or at the first customer and prior to each additional point of disinfection must be measured each day during peak hourly flow.

3. In lieu of the monitoring conducted under the provisions of subsection (B)(2) of this section to develop the disinfection profile, the system may elect to meet the requirements of subsection (B)(3)(a) of this section. In addition to the monitoring conducted under the provisions of subsection (B)(2) of this section to develop the disinfection profile, the water system may elect to meet the requirements of subsection (B)(3)(b) of this section.

a. A system that has three years of existing operational data may submit those data, a profile generated using those data, and a request that the Director approve use of those data in lieu of monitoring under the provisions of subsection (B)(2) of this section not later than March 31, 2000. The Director must determine whether these operational data are substantially equivalent to data collected under the provisions of subsection (B)(2) of this section. These data must also be representative of *Giardia lamblia* inactivation through the entire treatment plant and not just of certain treatment segments. Until the Director approves this request, the water system is required to conduct monitoring under the provisions of subsection (B)(2) of this section.

b. In addition to the disinfection profile generated under subsection (B)(2) of this section, a PWS that has existing operational data may use those data to develop a disinfection profile for additional years. Such systems may use these additional yearly disinfection profiles to develop a benchmark under the provisions of subsection (C) of this section. The Director must determine whether these operational data are substantially equivalent to data collected under the provisions of subsection (B)(2) of this section. These data must also be representative of inactivation through the entire treatment plant and not just of certain treatment segments.

4. The system must calculate the total inactivation ratio as follows:

a. If the system uses only one point of disinfectant application, the system may determine the total inactivation ratio for the disinfection segment based on either of the methods in subsection (B)(4)(a)(i) or (B)(4)(a)(ii) of this section.

i. Determine one inactivation ratio ($CTcalc/CT_{99.9}$) before or at the first customer during peak hourly flow.

ii. Determine successive $CTcalc/CT_{99.9}$ values, representing sequential inactivation ratios, between the point of disinfectant application and a point before or at the first customer during peak hourly flow. Under this alternative, the water system must calculate the total inactivation ratio by determining ($CTcalc/CT_{99.9}$) for each sequence and then adding the ($CTcalc/CT_{99.9}$) values together to determine (Σ ($CTcalc/CT_{99.9}$).

b. If the system uses more than one point of disinfectant application before the first customer, the system must determine the CT value of each disinfection segment immediately prior to the next point of disinfectant application, or for the final segment, before or at the first customer, during peak hourly flow. The ($CTcalc/CT_{99.9}$) value of each segment and ($\Sigma(CTcalc/CT_{99.9})$) must be calculated using the method in subsection (B)(4)(a) of this section.

c. The system must determine the total logs of inactivation by multiplying the value calculated in subsection (B)(4)(a) or (b) of this section by 3.0.

5. A system that uses either chloramines or ozone for primary disinfection must also calculate the logs of inactivation for viruses using a method approved by the Director.

6. The system must retain disinfection profile data in graphic form, as a spreadsheet, or in some other format acceptable to the Director for review as part of sanitary surveys conducted by the Director.

C. Disinfection benchmarking.

1. Any system required to develop a disinfection profile under the provisions of subsections (A) and (B) of this section and that decides to make a significant change to its disinfection practice must consult with the Director prior to making such change. Significant changes to disinfection practice are:

a. Changes to the point of disinfection;

b. Changes to the disinfectant(s) used in the treatment plant;

c. Changes to the disinfection process; and

d. Any other modification identified by the Director.

2. Any system that is modifying its disinfection practice must calculate its disinfection benchmark using the procedure specified in subsections (C)(2)(a) through (b) of this section.

a. For each year of profiling data collected and calculated under subsection (B) of this section, the system must determine the lowest average monthly *Giardia lamblia* inactivation in each year of profiling data. The system must determine the average *Giardia lamblia* inactivation for each calendar month for each year of profiling data by dividing the sum of daily *Giardia lamblia* of inactivation by the number of values calculated for that month.

b. The disinfection benchmark is the lowest monthly average value (for water systems with one year of profiling data) or average of lowest monthly average values (for systems with more than one year of profiling data) of the monthly logs of *Giardia lamblia* inactivation in each year of profiling data.

3. A system that uses either chloramines or ozone for primary disinfection must also calculate the disinfection benchmark for viruses using a method approved by the Director.

4. The system must submit information in subsections (C)(4)(a) through (c) of this section to the Director as part of its consultation process.

   a. A description of the proposed change;

   b. The disinfection profile for *Giardia lamblia* (and, if necessary, viruses) under subsection (B) of this section and benchmark as required by subsection (C)(2) of this section; and

   c. An analysis of how the proposed change will affect the current levels of disinfection.

§ 1305 FILTRATION

A public water system subject to the requirements of this part that does not meet all of the criteria in this part and Part VIII for avoiding filtration must provide treatment consisting of both disinfection, as specified in § 804(B), and filtration treatment which complies with the requirements of subsection (A) or (B) of this section or § 805 (B) or (C) by December 31, 2001.

A. Conventional filtration treatment or direct filtration.

1. For systems using conventional filtration or direct filtration, the turbidity level of representative samples of a system's filtered water must be less than or equal to 0.3 NTU in at least 95 percent of the measurements taken each month, measured as specified in Appendix D § 801-D(A) and (C).

2. The turbidity level of representative samples of a system's filtered water must at no time exceed 1 NTU, measured as specified in Appendix D §801-D (A) and (C).

3. A system that uses lime softening may acidify representative samples prior to analysis using a protocol approved by the Director.

B. Filtration technologies other than conventional filtration treatment, direct filtration, slow sand filtration, or diatomaceous earth filtration. A system may use a filtration technology not listed in subsection (A) of this section or in § 805(B) or (C) if it demonstrates to the Director, using pilot plant studies or other means, that the alternative filtration technology, in combination with disinfection treatment that meets the requirements of § 804(B), consistently achieves 99.9 percent removal and/or inactivation of *Giardia lamblia* cysts and 99.99 percent removal and/or inactivation of viruses, and 99 percent removal of *Cryptosporidium oocysts*, and the Director approves the use of the filtration technology. For each approval, the Director will set turbidity performance requirements that the system must meet at least 95 percent of the time and that the system may not exceed at any time at a level that consistently achieves 99.9 percent removal and/or inactivation of *Giardia lamblia* cysts, 99.99 percent removal and/or inactivation of viruses, and 99 percent removal of *Cryptosporidium oocysts.*

§ 1306 FILTRATION SAMPLING REQUIREMENTS

A. Monitoring requirements for systems using filtration treatment. In addition to monitoring required by Appendix D, a system subject to the requirements of this part that provides conventional filtration treatment or direct filtration must conduct continuous monitoring of turbidity for each individual filter using an approved method in Appendix D §801-D (A) and must calibrate turbidimeters using the procedure specified by the manufacturer. Systems must record the results of individual filter monitoring every 15 minutes.

B. If there is a failure in the continuous turbidity monitoring equipment, the system must conduct grab sampling every four hours in lieu of continuous monitoring, but for no more than five working days following the failure of the equipment.

§ 1307 REPORTING AND RECORDKEEPING REQUIREMENTS

In addition to the reporting and recordkeeping requirements in § 806, a system subject to the requirements of this part that provides conventional filtration treatment or direct filtration must report monthly to the Director the information specified in subsections (A) and (B) of this section beginning the first of the month following the month that these regulations become effective. In addition to the reporting and recordkeeping requirements in § 806, a water system subject to the requirements of this part that provides filtration approved under § 1305(B) must report monthly to the Director the information specified in subsection (A) of this section beginning the first of the month following the month that these regulations become effective. The reporting in subsection (A) of this

section is in lieu of the reporting specified in § 806(B)(1).

A. Turbidity measurements as required by § 1305 must be reported within 10 days after the end of each month that the system serves water to the public. Information that must be reported includes:

1. The total number of filtered water turbidity measurements taken during the month.

2. The number and percentage of filtered water turbidity measurements taken during the month which are less than or equal to the turbidity limits specified in § 1305(A) or (B).

3. The date and value of any turbidity measurements taken during the month which exceed 1 NTU for systems using conventional filtration treatment or direct filtration, or which exceed the maximum level set by the Director under § 1305(B).

B. Systems must maintain the results of individual filter monitoring taken under § 1306 for at least three years. Water systems must report that they have conducted individual filter turbidity monitoring under § 1306 within 10 days after the end of each month the system serves water to the public. Systems must report individual filter turbidity measurement results taken under § 1306 within 10 days after the end of each month the system serves water to the public only if measurements demonstrate one or more of the conditions in subsections (B)(1) through (4) of this section. Systems that use lime softening may apply to the Director for alternative exceedance levels for the levels specified in subsections (B)(1) through (4) of this section if they can demonstrate that higher turbidity levels in individual filters are due to lime carryover only and not due to degraded filter performance.

1. For any individual filter that has a measured turbidity level of greater than 1.0 NTU in two consecutive measurements taken 15 minutes apart, the system must report the filter number, the turbidity measurement, and the date(s) on which the exceedance occurred. In addition, the system must either produce a filter profile for the filter within 7 days of the exceedance (if the system is not able to identify an obvious reason for the abnormal filter performance) and report that the profile has been produced or report the obvious reason for the exceedance.

2. For any individual filter that has a measured turbidity level of greater than 0.5 NTU in two consecutive measurements taken 15 minutes apart at the end of the first four hours of continuous filter operation after the filter has been backwashed or otherwise taken offline, the system must report the filter number, the turbidity, and the date(s) on which the exceedance occurred. In addition, the system must either produce a filter profile for the filter within 7 days of the exceedance (if the system is not able to identify an obvious reason for the abnormal filter performance) and report that the profile has been produced or report the obvious reason for the exceedance.

3. For any individual filter that has a measured turbidity level of greater than 1.0 NTU in two consecutive measurements taken 15 minutes apart at any time in each of three consecutive months, the system must report the filter number, the turbidity measurement, and the date(s) on which the exceedance occurred. In addition, the system must conduct a self-assessment of the filter within 14 days of the exceedance and report that the self-assessment was conducted. The self assessment must consist of at least the following components: assessment of filter performance; development of a filter profile; identification and prioritization of factors limiting filter performance; assessment of the applicability of corrections; and preparation of a filter self-assessment report.

4. For any individual filter that has a measured turbidity level of greater than 2.0 NTU in two consecutive measurements taken 15 minutes apart at any time in each of two consecutive months, the system must report the filter number, the turbidity measurement, and the date(s) on which the exceedance occurred. In addition, the system must arrange for the conduct of a comprehensive performance evaluation by the Director or a third party approved by the Director no later than 30 days following the exceedance and have the evaluation completed and submitted to the Director no later than 90 days following the exceedance.

C. Additional Reporting Requirements.

1. If at any time the turbidity exceeds 1 NTU in representative samples of filtered water in a system using conventional filtration treatment or direct filtration, the system must inform the Director as soon as possible, but no later than the end of the next business day.

2. If at any time the turbidity in representative samples of filtered water exceeds the maximum level set by the Director under § 1305 (B) for filtration technologies other than conventional filtration treatment, direct filtration, slow sand filtration, or diatomaceous earth filtration, the system must inform the Director as soon as possible,

but no later than the end of the next business day.

PART XIV
PUBLIC WATER SYSTEM OPERATOR CERTIFICATION

§ 1401 PURPOSE

All public water system operators shall be certified by the Director pursuant to § 2539 of the Navajo Nation Safe Drinking Water Act (NNSDWA). Public water system owners shall ensure that their systems are supervised by adequately trained and certified operators, pursuant to ~~these~~ regulations of this part. The possession of adequate training and maintenance of certification by public water system operators protect the public health by improving the operation and maintenance of public water system and by promoting the provision of safe drinking water. ~~and maintaining operator certification protects the public health by promoting the provision of safe drinking water and improving the operation and maintenance of public water systems.~~

§ 1402 OPERATOR CERTIFICATION

A. Owners of all public water systems ~~must~~ shall place the direct supervision of ~~their~~ that public water system, including each treatment plant and/or distribution system that comprises that public water system, under the responsible charge of an operator(s) holding a valid certification at or above the level required for the public water system, as provided in § 1404.

B. Operator(s) in responsible charge ~~or equivalent~~ must hold, at a minimum, a valid certification at or above the level required for their public water system, including each treatment plant and distribution system, as provided in § 1404.

C. All operating personnel making process control/system integrity decisions about water quality or quantity that effect public health must be certified in accordance with this part.

D. ~~Owners shall require that a designated certified operator be available for each operating shift.~~ The owner of a public water system shall ensure that for each operating shift, a certified operator is designated and is on-site or able to be contacted as needed in order to initiate any necessary action in a timely manner.

§ 1403 GENERAL REQUIREMENTS

A. The owner of a public water system shall ensure that the person in responsible charge of the system, for each operating shift, is a certified operator and is certified at or above the level of the public water system, as provided in § 1404.

1. A person in charge of a public water system, in the absence of the principal certified operator, shall be certified at a level no lower than one level below the level of the public water system.

2. ~~No person shall make a decision about process control or system integrity regarding water quality or water quantity that affects public health, unless that person is a certified operator.~~ (reserved)

3. If a certified operator is in direct responsible charge of more than one public water system, the certified operator shall be certified at or above the level of the public water system with the highest level.

B. The public water system owner ~~shall notify the Director in writing of the name of the current certified operator within 30 days of the effective date of these regulations and~~ shall notify the Director of the name of any person replacing the currently certified operator within 10 business days of the change ~~in operators~~. The owner shall notify the Director in writing within 10 business days of the date a public water system ceases operation.

C. There ~~shall be~~ are four levels of public water systems, with Level 4 being the classification for the most complex. The Director shall classify each system pursuant to the criteria listed in § 1404, and may increase the classification of a public water system to a higher level ~~only~~ for the following reasons:

1. The public water system has special design features ~~characteristics~~ that make it more difficult to operate than usual;

2. The source water is unusually difficult to treat; or

3. The public water system poses potential risk to public health.

The Director shall notify the owner in writing of any proposed change in classification. The owner may respond to any change in classification within 30 days of notification, and the Director ~~will~~ shall consider and respond to such comments before making a final decision as to classification. Fora multi-facility, each component system shall be classified according to its own complexity and also to the total population or population equivalent served.

D. A certified operator may operate any water system of the same level for which the operator is certified or of any lower level.

E. NNEPA will consider that a system has an appropriately certified operator when the operator:

1. holds a valid certification equal to or greater than that required for the classification of the treatment facility and/or distribution system, as specified in these regulations;

2. demonstrates competency through knowledge, skills, and abilities to operate the system in compliance with the NNPDWR; and

3. is on-site during a specified operating shift, or is able to be contacted as needed in order to initiate any necessary action in a timely manner.

§ 1404 CLASSIFICATION OF PUBLIC WATER SYSTEMS

A. ~~Public water systems are classified by type and then by level according to each system characteristic, as follows:~~ NNEPA will classify water distribution systems according to the following classification system:

1 Water Distribution System:

Level	Population/System Characteristics
Level 1	Population <3,300, Groundwater Disinfection by hypochlorite only
Level 2	3,301 - 10,000 population served, or Gaseous and other Chlorine Disinfectant, or 5 or more Pressure Zones, or Recycled Water Distribution, or System is Blending Sources to meet MCL
Level 3	10,001 - 25,000 population served
Level 4	25,001 population served

2 Water Treatment Plant:

1. NNEPA will classify all water treatment plants using a point system as explained in the table below. Systems that score less than or equal to 14 points will only require distribution certification.

Level	Points
Level 1 (Basic)	15~~1~~-30
Level 2 (Intermediate)	31-55
Level 3 (Advanced Intermediate)	56-75
Level 4 (Advanced)	~~>76~~ ≥76

B. The points assigned to each water treatment plant for each system characteristic are as follows:

~~Water Treatment Plant~~

SYSTEM CHARACTERISTICS	**POINTS**
Population	1 per 1,000
Maximum Design Capacity	1 per 0.5 MGD up to 10
Groundwater Source without coliform (total, fecal or e. *coli*) presence	2
Groundwater Source with coliform (total, fecal or e. coli) presence	5
GWUDI Source	8
Surface Source	10
AVERAGE RAW WATER QUALITY VARIATION:	
Little or no variation - only treatment is disinfection	0
Minor variation - eg. "High quality" surface source appropriate for slow sand filtration	2
Requires moderate variation in chemical feed, dosage changes made; monthly(3pts), weekly (4pts), or daily (5pts)	3-5
Variation significant enough to require pronounced and/or very frequent changes (more than daily)	6
Severe variation - source subject to non-point discharges, agricultural/urban storm runoff, flooding	7
Raw water quality subject to agricultural or municipal waste point discharges	8
Raw water quality subject to recreational use (boating fishing, etc.)	6
Raw water quality subject to periodic serious industrial waste pollution	10
Taste and/or odor for which treatment process adjustment are routinely made	2
Color levels >NNSDWR	3
Iron and/or manganese levels > NNSDWR	2
Algal growths for which treatment process adjustments are routinely made	3
CHEMICAL TREATMENT ADDITION PROCESS:	
Fluoridation	5
DISINFECTION	
If a disinfectant/oxidizer is generated on-site, add 1 point to the point value shown	
Hypochlorite Liquid or Solid	5
Chlorine Gas	8

Chlorine Dioxide	10
Chloramine	10
Ozone	10
UV Irradiation	2
Potassium permanganate	4
pH Adjustment (Calcium carbonate, carbon dioxide, hydrochloric acid, calcium oxide, calcium hydroxide, sodium hydroxide, sulfuric acid, other)	4
Stability or Corrosion Control (calcium oxide, calcium hydroxide, sodium carbonate, sodium hexametaphosphate, other)	10
COAGULATION AND FLOCCULATION PROCESS	
Rapid Mix (mechanical, injection and in-line blenders)	2
Primary coagulant addition	6
Coagulant aid / flocculant chemical addition (in addition to primary coagulant use)	2
Flocculation	2
Filter aid addition (non-ionic/anionic polymers)	2
CLARIFICATION/SEDIMENTATION PROCESS	
Sedimentation (plain, tube, or plate)	4
Contact adsorption	6
Upflow Clarification	8
Horizontal-flow (rectangular basins)	5
Horizontal-flow (round basins)	7
Other clarification process (air floatation, ballasted clarification, etc)	6
FILTRATION PROCESS	
Granular Media filtration < 3gpm/sq. ft.	10
Granular media filtration > 3gpm/sq. ft.	20
Direct filtration	5
MEMBRANE FILTRATION	
for compliance with a NNPDWR	10
for compliance with a NNSDWR	6
Diatomaceous earth (pre-coat filtration)	10
Cartridge/bag	5
Gravity Sand Filter	5
Pressure or greensand filtration	20
Biologically active filter	15
Pre-filtration (staged cartridges, pressure sand w/o coagulation, etc.): add one point per stage to max of 3 points.	1-3
OTHER TREATMENT PROCESSES	
O_2 (aeration)	3
Packed tower aeration	5

Air stripping	5
Ion exchange softening	5
Lime-soda ash softening (includes: chemical addition, mixing/flocculation/clarification/filtration - do not add points for these processes separately)	20
Granular Activated Carbon (do not assign points when included as a bed layer in another filter)	5
Powdered activated carbon	2
Activated Alumina	5
Chemical Precipitation	15
BLENDING SOURCES WITH SIGNIFICANTLY DIFFERENT WATER QUALITY:	
to achieve compliance with a NNPDWR	4
to achieve compliance with a NNSDWR	2
Reservoir management employing chemical addition	2
Electrodialysis	15
Other: including but not limited to POE and POU devices, various adsorption technologies, ion-exchange for Arsenic removal.	2-15
RESIDUALS DISPOSAL	
Discharge to surface, sewer, or equivalent	1
Discharge to lagoon/drying bed, with no recovery/recycling - e.g. downstream outfall	1
On-site disposal, land application	1
Backwash recovery/recycling: discharge to basin or lagoon and then to source	3
Backwash recovery/recycling: discharge to basin or lagoon and then to plant intake	5
FACILITY CHARACTERISTICS	
Instrumentation - Use of SCADA or similar instrumentation systems to provide data, with:	
Monitoring/alarm only, no process operation	0
Limited process operation - e.g. remote shutdown capability	1
Moderate process operation	2
Extensive or total process operation	4
Design limitation regarding: clearwell, pumps, storage, etc.	1-5

C. Levels of required training and certification.

1 Operators certified at Level 1 shall receive training to include, but not limited to, General Operation/Maintenance, Security and Safety, Drinking Water Regulations, Sampling and Basic Distribution System ~~training~~.

2 Operators certified at Level 2 shall receive training to include, but not limited to, General Operation and Maintenance, Backflow Prevention and Cross Contamination (Optional), Treatment-Disinfection/Fluoridation, Security and Safety, Water Quality Parameters and Sampling, and Drinking Water Regulations.

3 Operators certified at Level 3 shall receive training to include, but not limited to, Advanced Operation and Maintenance, Backflow Prevention/Cross Contamination, Treatment-Disinfection and Fluoridation Instrumentation, Security, Safety and Administrative Procedures, Water

Quality Parameters and Sampling, SCADA or similar instrumentation systems, Drinking Water Regulations and Compliance.

4 Operators certified at Level 4 shall receive training to include, but not limited to, Advanced Operation and Maintenance, Backflow Prevention and Cross Contamination, Treatment-Disinfection and Fluoridation, Surface Water Treatment Plant Processes and Operation Security, Safety and Administrative Procedures, Water Quality Parameters and Sampling, SCADA or similar instrumentation systems, Drinking Water Regulations and Compliance.

§ 1405 CERTIFICATION REQUIREMENTS

To be certified, an applicant shall:

A. Mmeet the experience and educational requirements in § 1409; and

B. Ppass a written examination for the level in which application is made as specified in § 1410, or

C. Mmeet the reciprocity requirements in § 1407, in lieu of § ~~1406(B)~~ 1405(B).

§ 1406 APPLICATION FOR CERTIFICATION

A. Any person who requires a certification shall complete, sign and submit to the Director an application for certification, on a form provided by the Director, together with fees required in § 1416. Applications must be received by the Director no later than 30 calendar days prior to the date of examination, if applicable.

B. Prior to submitting to the Director an application for certification, ~~An~~an operator shall successfully meet the educational, experience and training requirements stipulated in § 1409, prior to application.

C. Each application submitted will be reviewed for completeness by the Director within 30 days of its receipt, or such longer time as the Director may deem necessary. The Director may also request additional information from the applicant when necessary to clarify or supplement previously submitted material. Request for such information will not render an application incomplete.

§ 1407 RECIPROCITY

A. The Director may issue a certificate without examination to an applicant who holds a certificate issued by another state, territory, the District of Columbia, tribal government, federal entity, or organization if the criteria in subsection (C) of this section are met and upon the completion of the additional training specified in subsection (E) of this section.

B. An operator who is certified in another jurisdiction and requests a Navajo Nation certificate shall submit to the Director an application and a notarized copy of his/her current certificate with the appropriate fee, as specified in § 1416. All fees are non-refundable.

C. The criteria for issuing a Navajo Nation certificate are as follows:

1 The certificate from another jurisdiction must be current and valid for the particular type of public water system and level for which application is made;~~.~~

2 The certificate from another jurisdiction must be issued under laws in compliance with § 1419 (a) of the SDWA Amendments of 1996 (Pub. L. 104-182); and~~.~~

3 The applicant shall meet the experience and education requirements in § 1409.

D. The application requesting a certificate will not be considered until all information, documentation, and fees are received by the Director. A determination will be made within 30 days thereof. If the application is approved, a certificate will be issued. If the application is disapproved, the Director will notify the applicant in writing that he/she will be afforded an opportunity to take the Navajo Nation certification examination. All application fees will be ~~applied to~~used to defray, in whole or in part, the cost to the applicant of taking ~~of~~ the next examination. ~~All fees are non-refundable.~~

E. In addition to meeting the criteria specified in subsection (C) of this section, the applicant shall attend a full day of training pertaining specifically to the requirements of the NNSDWA and the NNPDWR ~~after~~ following receipt of a letter from the Director approving certification ~~is received by the applicant~~.

F. Certification by reciprocity is based upon the validity of the original certificate issued by another jurisdiction under laws in compliance with § 1419 (a) of the SDWA Amendments of 1996 (Pub. L. 104-182). The suspension or revocation of the original certificate upon which reciprocity is granted shall be reported to the Director by the certified operator within 10 working days of his/her notification by the certifying agency. Failure to ~~provide notification~~ report to the Director shall constitute fraud, deceit or misrepresentation and may result in suspension or revocation of the certificate pursuant to § 1414(B) and in any other enforcement action deemed appropriate by the Director.

§ 1408 ~~GRANDPARENTING~~ (Reserved)

~~A. Grandparenting is permitted only for existing operator(s) in responsible charge of existing systems at the time this Part of the NNPDWR becomes effective. Grandparenting permits an operator to obtain certification without meeting the certification requirements in § 1405.~~

~~B. The water system owner shall apply for certification on a form provided by the Director within 30 calendar days of the effective date of this Part. The Director will respond within 30 days from the date of application with a determination as to whether the operator is eligible for "grandparent" certification status. The Director will make this decision on a case-by-case basis, based upon a completed application, a written letter of request and supporting documents. If the operator is determined to be eligible for grandparent certification status by the Director, the operator may obtain Navajo Nation certification by submitting the fees specified in § 1416.~~

~~C. If the Director approves the certification, the following restrictions shall apply:~~

~~1 The certification must be site specific and non-transferable to other operators.~~

~~2 If the classification of the plant or distribution system changes to a higher level, then the grandparented certification will no longer be valid.~~

~~3 If a grandparented operator chooses to work for a different water system, he or she must meet the initial certification requirements for that system.~~

~~4 Prior to certification, the grandparented operator shall attend a full day's training pertaining specifically to the requirements of the NNSDWA and the NNPDWR.~~

~~D. The grandparented operator shall, within 12 months of receiving initial certification, meet all requirements to obtain certification renewal, including the payment of any necessary fees, acquiring necessary training to meet the renewal requirements, and demonstrating the skills, knowledge, ability and judgment for that classification.~~

§ 1409 EXPERIENCE AND EDUCATION

A. To determine whether an applicant has adequate experience required for certification at a particular level, the Director shall consider the following:

1 Years of experience at a lower level; and

2 Previous operational experience, including experience in another jurisdiction or related field. The applicant shall have acquired at least 6 months of operational experience within the 5-year period preceding the date of application.

B. The Director shall not certify an applicant at more than one level higher than the level of the highest level water system at which the applicant has at least 1 year of experience.

C. For the purposes of this Part, a "qualifying discipline" means engineering, biology, chemical sciences, or a closely related technical or scientific discipline. The Director may require that the applicant provide transcripts or certificates to verify completion of the education requirements.

D. For the purposes of this Part, "qualifying experience" means experience directly in the field for which application is made. The fields of qualifying experience are water treatment and distribution.

E. An applicant shall meet the following requirements for admission to a certification examination:

1 For Level 1, at least:

a. high school graduation or equivalent and one year of qualifying experience in the operation of a ~~class 1~~ Level 1 or higher utility~~. No substitution for experience will be permitted.~~;or

b. Two years or more of post-secondary education in a qualifying discipline.

2. For Level 2, at least:

a. High school graduation or the equivalent and ~~3 years~~2 years of qualifying experience, including one year as a Level 1 certified operator; or

b. Two years of post-secondary education in a qualifying discipline and 1 year of qualifying experience, including 6 months as a certified Level 1 operator; or

c. A bachelor's degree in a qualifying discipline and 6 months of qualifying experience.

3. For Level 3, at least:

a. High school graduation or the equivalent and ~~2~~3 years of qualifying experience, including ~~4 years of qualifying experience~~ 1 year as a Level 2 certified operator; or

b. Two years of postsecondary education in a qualifying discipline, and 2 years of qualifying experience, including 1 year as a Level 2 certified operator; or

c. A bachelor's degree in a qualifying discipline and ~~1 year~~ 18 months qualifying experience, including 1 year as a Level 2 certified operator.

4. For Level 4, at least:

a. High school graduation or the equivalent and ~~6 years~~ 4 years of qualifying experience, including ~~4 years of qualifying experience~~ 1 year as a Level 3 certified operator; or

b. Two years of post-secondary education in a qualifying discipline and ~~4~~ 3 years of qualifying experience, including ~~2 years~~1 year as a certified Level 3 operator; or

c. A bachelor's degree in a qualifying discipline, and ~~1 year~~30 months of qualifying experience, including 1 year as a certified Level 3 operator.

F. Professional Development Hours (PDH) will be credited to certified operators ~~for attending training~~ who attend training that addresses compliance issues relating to the NNSDWA and regulations. Such training may be offered by the ~~offered by providers of the~~ Association of Boards of Certification (ABC) or other ~~approved~~ providers ~~that address compliance of the Navajo Nation Safe~~

~~Drinking Water Act and regulations~~ as approved by the Director.

§ 1410 EXAMINATION

A. Certification ~~E~~examinations will be given by the PWSSP under the authority of the Director. The examination shall be used to determine knowledge, ability and judgment of the applicant for a specific level of certification.

B. A score of 70% is required for certification. All examinations will be graded and applicants will be notified of the results within 30 days of examination date. Examination papers will not be returned to the applicant, but may be reviewed by the applicant at the PWSSP office. Under no circumstances shall the exams be viewed immediately after the examination or at the site of examination.

~~C. The Director shall not issue an initial certificate to an applicant who has not taken and passed the examination for certification, except as provided in §§ 1407 and 1408.~~

~~D~~C. Examinations for certification will be scheduled at such times and locations as the Director deems appropriate.

~~E~~D. If an applicant does not pass an examination for certification, the applicant may re-apply and re-test after ~~90~~ 30 days from the date of the last attempted examination.

§ 1411 EXAMINATION APPEAL PROCESS

A. All applicants with a score from 65% to 69% will be allowed to appeal an exam score by sending a letter of appeal to the Director within 30 days of receiving the notice of exam results.

B. The Director will schedule a date for the applicant to review the graded exam and to indicate which questions are being appealed. The applicant will be given adequate time to specify the reason for the appeal. References are encouraged to be cited and supporting documentation may be submitted to substantiate claims that examination questions are flawed or ambiguous.

C. The Director will designate a proctor to oversee the appeal session. The proctor is prohibited from discussing any exam issues or to assist in the appeal of any missed questions.

D. At the end of the appeal session, the proctor will collect the examination, the answer sheet, the appeal form, and any notes or scratch paper. The proctor will also review any reference material brought to the appeal session to ensure that no notes or comments pertaining to examination questions have been added to or written upon these materials. The applicant will be allowed to leave with only the reference material that he/she brought to the session.

E. The Director will review the appeal and the supporting documentation submitted by the appellant and will make a determination within 30 days of the appeal. All decisions will be final, and no further appeals will be allowed.

§ 1412 RENEWAL OF CERTIFICATES

A. If the Director renews a certificate, the renewed certificate shall be valid for a period of 3 years. A renewal application and a fee, set by the Director, payable to the Navajo Nation Public Water System Supervision Program shall be submitted at least 30 days prior to the expiration of each certificate. The request for renewal shall be approved by the Director provided that the criteria in subsections (B) or (C) of this section are met.

B. Renewal will require that each certified operator be credited with having obtained 35 PDHS in the 3-year period preceding the date on which the renewal application is due. Documentation of each training credit shall be on a form provided by the PWSSP and verification shall be provided in writing by the operator's supervisor or the entity that provided the education or training.

C. A certified operator may renew a certificate by taking and passing an examination for the same level and classification, in lieu of meeting the requirements specified in subsection (B) of this section.

§ 1413 AN EXPIRED CERTIFICATE

A. A certificate shall expire on the expiration date printed on the certificate, unless renewed before the expiration date pursuant to § 1412.

B. Expired certificates may be reinstated without penalty upon application within 30 days of the date of expiration. An expired certificate which has not been reinstated within the 30 day period may be reinstated for the same level without examination within 90 days of the certificate expiration date if the certificate holder files the appropriate application, meets the requirements of renewal in § 1412 and submits payment for renewal fees specified in § 1416 plus $10.00 per month late fee for each month or portion thereof beyond the expiration date.

C. If an expired certificate is not renewed within 90 days of the certificate expiration date, the certificate shall not be reinstated. The certificate holder may re-apply and be re-examined as a new applicant.

§ 1414 SUSPENSION AND REVOCATION

A. The Director may suspend or revoke any or all certificate(s) held by a certified operator as stipulated under this section.

B. The Director shall suspend or revoke certification under the following circumstances:

1 The certificate-holder has been found by tribal, federal or state court to have violated laws applicable to drinking water systems;~~.~~

2 The certificate-holder obtained a certificate through the use of fraud, deceit or misrepresentation;~~.~~

3 The certificate-holder has prepared a false or fraudulent report or record regarding the operation or management of a drinking water system; or~~.~~

4 The certificate-holder has violated any other law that poses a risk to the health and safety of the public served by the drinking water system.

C. When the Director contemplates the suspension or revocation of a certificate, the Director shall serve upon the certificate-holder an initial order pursuant to the Uniform Rules § 304(a), containing a statement:

1 T~~t~~hat the Director has sufficient evidence which, if not rebutted or explained, will justify the Director in suspending or revoking the certificate;

2 T~~t~~hat indicates the general nature of the evidence; and

3 T~~t~~hat unless the certificate-holder within 30 days after ~~service of notice~~ the date of issuance of the initial order requests a hearing pursuant to Uniform Rules § 305, the Director will take the contemplated action and judicial review will not be available. If the certificate-holder requests a hearing, the Director shall designate a Hearing Official and a Hearing Clerk and a hearing shall be held pursuant to Uniform Rules Subpart 3(C). Judicial review of the final order shall be available pursuant to Uniform Rules § 332.

4 Notwithstanding Uniform Rules § 304(b)(3), an order suspending or revoking a certificate need not specify a schedule for compliance.

D. If any certificate held by an operator is suspended or revoked by the Navajo Nation, a letter by the operator to request re-application and re-examination may be submitted to the Director for consideration upon the expiration of the action and in accordance with the final determination of the suspension or revocation.

1 The Director shall make a determination and respond in writing within 30 days of such request to permit or deny re-application and re-certification. The Director may request additional information to evaluate the severity of the violation that led to the suspension or revocation, any good faith efforts to remedy that violation, and any other factors that the Director deems relevant in the determination.

2 Each request for re-application and re-examination will be considered on a case-by-case basis. The Director may seek the advice of the Advisory Board to make a decision, as described in § 1415.

3 Under no circumstance(s) shall an approval for re-application and re-examination be in conflict with a previously issued suspension or revocation.

4 All decisions by the Director are final. If approved, the applicant shall be permitted to re-apply and retake the exam as a new applicant subject to the certification requirements of this Part. If disapproved, a letter of denial with an explanation will be issued.

§ 1415 UTILITY OPERATORS CERTIFICATION ADVISORY ~~BOARD~~COMMITTEE

~~A. Pursuant to § 309 of the NNSDWA, a Board shall be appointed by the Director to make recommendations and provide technical advice and assistance to the Director as may be needed. The Director shall promptly notify the Board of all matters brought before the Director to which the NNPDWR Operator Certification requirements are applicable.~~

~~B. The Board shall consist of five (5) members appointed by the Director as follows:~~

~~1. 1 employee of PWSSP;~~

~~2. 1 manager, director or administrator of Navajo Tribal Utility Authority;~~

~~3. 1 employee of Navajo Area Bureau of Indian Affairs;~~

~~4. 1 currently employed operator of a water system on the Navajo Nation;~~

~~5. 1 representative of small public water systems within the Navajo Nation; and~~

~~The Director shall also appoint two certified operators to serve as alternates to Board members in their absence. All alternates appointed prior to the effective date of this Part will be allowed to serve out the remainder of their three year terms.~~

~~C. Appointments to the Board shall be for 3 year terms. The Director shall appoint new Board members at its first meeting of each fiscal year. The terms shall overlap so that no more than three terms shall expire in any one year. A board member may be reappointed, but no member, except the PWSSP member, may serve more than two consecutive terms.~~

~~D. At the first meeting of the Board each fiscal year, the Board shall elect from its members a chairperson and such officers as deemed necessary. The PWSSP member shall be the executive secretary and shall keep records of all meetings for the review of the Director. The Board shall meet at least 4 times per year.~~

~~E. A quorum shall consist of at least three members: the chairperson or designated representative, executive secretary or designated representative, and one other member of the Board.~~

~~F. In the event of a vacancy caused by death, resignation, or removal for cause, the Director shall appoint a successor for the unexpired term.~~

~~G. The duties of the Board shall include:~~

~~1. Advise the Director in administering and implementing this Part by providing a forum for the discussion of technical and administrative issues, and by providing training assistance or information on such assistance;~~

~~2. Review proposed new and/or revisions to rules and guidelines under this Part;~~

~~3. Make recommendations to the Director for replacement members when a Board vacancy occurs;~~

~~4. Perform any other function with regard to this Part XIV of the NNPDWR (Operator Certification Regulations).~~

~~H. Any Board member failing to attend three consecutive regular meetings shall be automatically removed as a member of the Board. The Director may remove any member of the Board for neglect of any duty required by law, for incompetency or for unprofessional conduct and shall remove any Board member who violates any provision of the NNSDWA or the NNPDWR. The Director shall fill any vacancies on the Board.~~

~~I. All Board members shall be paid upon the availability of funds.~~

A. Pursuant to § 309 of the NNSDWA, the Advisory Committee shall be appointed by the Director to make recommendations and provide technical advice and assistance to the Director as may be needed. The Director shall promptly notify the Advisory Committee of all significant matters brought before the Director to which the NNPDWR Operator Certification requirements are applicable.

B. The Advisory Committee members shall be appointed by the Director and must contain at least the following individuals as members:

1. 1 employee of NNEPA;

2 1 manager, director or administrator representative of the Navajo Tribal Utility Authority;

3. 1 employee of Navajo Area Bureau of Indian Affairs;

4. 1 currently employed operator of a water or wastewater system on the Navajo Nation;

5. 1 representative of small public water or wastewater systems within the Navajo Nation.

C. Each year, the Director shall elect from the Advisory Committee members a chairperson and such officers as deemed necessary. The NNEPA employee shall be the executive secretary and shall keep records of all Advisory Committee communications for the review of the Director.

D. The duties of the Advisory Committee members shall include (but are not limited to):

1. Advise the Director in administering and implementing this Part by providing a forum for the discussion of technical and administrative issues, and by providing training assistance or information on such assistance;

2. Provide input on proposed new and/or revisions to rules and guidelines under this Part;

3. Make recommendations to the Director for replacement members when a committee member vacancy occurs;

4. Perform any other function with regard to this Part XIV of the NNPDWR (Operator Certification Regulations).

E. The Director may remove any member of the Advisory Committee for neglect of any duty required by law, for incompetency or for unprofessional conduct or who violates any provision of the NNSDWA or its regulations.

F. All Advisory Committee members shall be reimbursed for their expenses related to participation on the committee upon the availability of funds.

§ 1416 FEE SCHEDULE

A. An applicant must pay the fees listed in the ~~attached~~ fee schedule established by the Director. These fees may be revised by the Director to reflect operator certification and training program costs, pursuant to the rulemaking requirements of Uniform Rules Subpart 4.

B. All fees must be paid to the Navajo Nation Public Water Systems Supervision Program.

C. In the event that an applicant is denied reciprocity or renewal of a certificate, the fees may be transferred to cover future application, renewal or examination fees. At no time will fees be returned to the applicant.

D. The fees may be used to cover the cost of examination services, training material reproduction, postage, and other certification-related costs.

~~E. If a grandparented operator is currently certified, renewal fees shall apply. If a grandparented operator is without a current certificate, then initial fees shall apply.~~

Part XXI—Enhanced Filtration and Disinfection (Systems Serving Fewer Than 10,000 People)

§ 2101 General Requirements

A. The requirements of this part constitute the a primary drinking water regulation. These regulations establish requirements for filtration and disinfection that are in addition to Part VIII (Surface Water Treatment) for systems serving fewer than 10,000 people. The regulations in this part establish or extend treatment technique requirements in lieu of maximum contaminant levels (MCLs) for the following contaminants: *Giardia lamblia,* viruses, heterotrophic plate count bacteria, *Legionella, Cryptosporidium* and turbidity. The treatment technique requirements consist of installing and properly operating water treatment processes which reliably achieve:

1. At least 99 percent (2 log) removal of *Cryptosporidium* between a point where the raw water is not subject to re-contamination by surface water runoff and a point downstream before or at the first customer for filtered systems, or *Cryptosporidium* control under the watershed control plan for unfiltered systems; and

2. Compliance with the profiling and benchmark requirements in §§ 2104(A) through 2105(C).

B. Applicability

1. Compliance with this section is required if a system:

   a. Is a public water system;

   b. Uses surface water or GWUDI as a source; ~~and profile as described in §§ 2102(A) and (B)~~;

   c. Serves fewer than 10,000 persons.

C. Compliance dates.

Part XXI systems must comply with these regulations beginning January 14, 2005 except where otherwise noted.

D. Requirements

1. Any finished water reservoir must be covered. These regulations apply to any public water system project constructed on or after March 15, 2002 as described in §§2102 (A) and (B);

2. If the public water system is an unfiltered system, owners/operators must comply with the updated watershed control requirements described in §§2103 (A), (B), and (C).

3. If the public water system is a community or non-transient non-community water system, owners/operators must develop a disinfection profile as described in §§2104 (A-G)

4. If the public water system is considering making a significant change to its disinfection practices, owners/operators must develop a disinfection benchmark and consult with the Director for approval of the change as described in §§ 2105(A-E);

5. If the public water system is a filtered system, owners/operators must comply with the combined filter effluent requirements as described in §§2106(A)-(D);

6. If the public water system is a filtered system that uses conventional or direct filtration, owners/operators must comply with the individual filter turbidity requirements as described in §§ 2107(A-E), and;

7. Owners/operators must comply with the applicable reporting and recordkeeping requirements as described in §§ 2108(A) and (B).

§ 2102 Finished Water Reservoirs

A. All Part VIII systems which serve fewer than 10,000 people are subject to this requirement.

B. Requirements for new finished water reservoirs

If the public water system begins construction of a finished water reservoir on or after March 15, 2002 the reservoir must be covered. Finished water reservoirs for which public water systems began construction prior to March 15, 2002 are not subject to this requirement.

§ 2103 Additional Watershed Control Requirements for Unfiltered Systems

A. If the public water system is a Part VIII system serving fewer than 10,000 persons which does not provide filtration, owners/operators must continue to comply with all of the filtration avoidance criteria in § 803, as well as the additional watershed control requirements in § 2103(B).

B. Updated watershed control requirements for unfiltered systems to continue to avoid filtration

1. Owners/operators must take any additional steps necessary to minimize the potential for contamination by *Cryptosporidium* oocysts in the source water. A public water system's watershed control program must, for *Cryptosporidium*:

a. Identify watershed characteristics and activities which may have an adverse effect on source water quality; and

b. Monitor the occurrence of activities which may have an adverse effect on source water quality.

C. Director determination of watershed control requirements

During an onsite inspection conducted under the provisions of § 803(B)(3), the Director must determine whether public water system watershed control program is adequate to limit potential contamination by *Cryptosporidium* oocysts. The adequacy of the program must be based on the comprehensiveness of the watershed review; the effectiveness of owner's/operator's program to monitor and control detrimental activities occurring in the watershed; and the extent to which the owner/operator has maximized land ownership and/or controlled land use within the watershed.

§ 2104 Disinfection Profile

A. A disinfection profile is a graphical representation of the public water system's level of *Giardia lamblia* or virus inactivation measured during the course of a year. If the public water system is a Part VIII CWS or NTNCWS which serves fewer than 10,000 persons, owners/operators must develop a disinfection profile unless the Director determines that the public water system's profile is unnecessary. The Director may approve the use of a more representative data set for disinfection profiling than the data set required under §§ 2104 (C) - (G).

B. Criteria to determine that a profile is unnecessary

The Director may only determine that a system's profile is unnecessary if a system's TTHM and HAA5 levels are below 0.064 mg/L and 0.048 mg/L, respectively. To determine these levels, TTHM and HAA5 samples must be collected after January 1, 1998, during the month with the warmest water temperature, and at the point of maximum residence time in the public water system's distribution system.

C. Requirements for a Disinfection Profile

1. A disinfection profile consists of three steps:

a. The owner/operator must first collect data for several parameters from the plant as discussed in § 2104 (D) over the course of 12 months. If the public water system serves between 500 and 9,999 persons, owner/operator must begin to collect data no later than July 1, 2003. If the public water system serves fewer than 500 persons, the owner/operator must begin to collect data no later than January 1, 2004.

b. The owner/operator must then use this data to calculate weekly log inactivation as discussed in §§ 2104 (E) and (F); and

c. Next, the owner/operator must use these weekly log inactivations to develop a disinfection profile as specified in § 2104 (G).

D. Required data for a Disinfection Profile

1. Owners/operators must monitor the following parameters to determine the total log inactivation using the analytical methods in Appendix D 801-D, once per week on the same calendar day, over 12 consecutive months:

a. The temperature of the disinfected water at each residual disinfectant concentration sampling point during peak hourly flow;

b. If the owner/operator uses chlorine, the pH of the disinfected water at each

residual disinfectant concentration sampling point during peak hourly flow;

c. The disinfectant contact time(s) ("T") during peak hourly flow; and

d. The residual disinfectant concentration(s) ("C") of the water before or at the first customer and prior to each additional point of disinfection during peak hourly flow.

E. Calculation of the inactivation ratio

Calculate the total inactivation ratio as follows, and multiply the value by 3.0 to determine log inactivation of *Giardia lamblia*:

Table 2100.1 Total Inactivation Calculation of *Giardia lamblia*

If the public water system	The owner/operator must determine
(a) Uses only one point of disinfectant application.	(1) One inactivation ratio ($CTcalc/CT_{99.9}$) before or at the first customer during peak hourly flow: or (2) Successive $CTcalc/CT_{99.9}$ values, representing sequential inactivation ratios, between the point of disinfectant application and a point before or at the first customer during peak hourly flow. Under this alternative, the owner/operator must calculate the total inactivation ratio by determining ($CTcalc/CT_{99.9}$) for each sequence and then adding the ($CTcalc/CT_{99.9}$) values together to determine ($3CTcalc/CT_{99.9}$).
(b) Uses more than one point of disinfectant application before the first customer.	The ($CTcalc/CT_{99.9}$) value of each disinfection segment immediately prior to the next point of disinfectant application, or for the final segment, before or at the first customer, during peak hourly flow using the procedure specified in paragraph (a)(2) of this section.

F. Requirements for systems using chloramines, ozone, or chlorine dioxide for primary disinfection

If the owner/operator uses chloramines, ozone, or chlorine dioxide for primary disinfection, the owner/operator must also calculate the logs of inactivation for viruses and develop an additional disinfection profile for viruses using methods approved by the Director.

G. Inactivation ratio reporting requirements.

Each log inactivation serves as a data point in the public water system disinfection profile. The owner/operator will have obtained 52 measurements (one for every week of the year). This will allow the owner/operator and the Director the opportunity to evaluate how microbial inactivation varied over the course of the year by looking at all 52 measurements (the Disinfection Profile). The owner/operator must retain the Disinfection Profile data in graphic form, such as a spreadsheet, which must be available for review by the Director as part of a sanitary survey. The owner/operator must use this data to calculate a benchmark if the owner/operator are considering changes to disinfection practices.

§ 2105 Disinfection Benchmark

A. If the public water system is a Part VIII system, the owners/operators are required to develop a disinfection profile under §§ 2104 (A) through (G). The owner/operator must develop a Disinfection Benchmark if the owner/operator decides to make a significant change to the public water system disinfection practice. Owners/operators must consult with the Director for approval before implementing a significant disinfection practice change.

B. Disinfection practices

1. Significant changes to disinfection practice include:

a. Changes to the point of disinfection;

b. Changes to the disinfectant(s) used in the treatment plant;

c. Changes to the disinfection process; or

d. Any other modification identified by the Director.

C. Requirements for significant changes to disinfection practices

1. If the owner/operator is considering a significant change to its disinfection practice, owners/operators must calculate a disinfection benchmark(s) as described in §§ 2105 (D) and (E) and provide the benchmark(s) to the Director. Owners/operators may only make a significant disinfection practice change after consulting with the Director for approval. Owners/operators must submit the following information to the Director as part of the consultation and approval process:

   a. A description of the proposed change;

   b. The disinfection profile for *Giardia lamblia* (and, if necessary, viruses) and disinfection benchmark;

   c. An analysis of how the proposed change will affect the current levels of disinfection; and

   d. Any additional information requested by the Director.

D. Disinfection Benchmark Calculations

If owner/operator is making a significant change to its disinfection practice, the owner/operator must calculate a disinfection benchmark using the procedure specified below:

1. To calculate a disinfection benchmark owners/operator must perform the following steps

   a. Step 1: Using the data that owners/operators collected to develop the Disinfection Profile, determine the average *Giardia lamblia* inactivation for each calendar month by dividing the sum of all *Giardia lamblia* inactivations for that month by the number of values calculated for that month.

   b. Step 2: Determine the lowest monthly average value out of the twelve values. This value becomes the disinfection benchmark.

E. Requirements for public water systems using chloramines, ozone, or chlorine dioxide for primary disinfection

If the owner/operator uses chloramines, ozone or chlorine dioxide for primary disinfection, the owner/operator must calculate the disinfection benchmark from the data that the owner/operator collected for viruses to develop the disinfection profile in addition to the *Giardia lamblia* disinfection benchmark calculated under § 2105 (D). This viral benchmark must be calculated in the same manner used to calculate the *Giardia lamblia* disinfection benchmark in § 2105 (D).

§ 2106 Combined Filter Effluent Requirements

A. All Part VIII systems which serve populations fewer than 10,000, are required to filter, and utilize filtration other than slow sand filtration or diatomaceous earth filtration must meet the combined filter effluent turbidity requirements of §§2106 (B)-(D). If the owner/operator uses slow sand or diatomaceous earth filtration, owners/operators are not required to meet the combined filter effluent turbidity limits of this section, but owner/operator must continue to meet the combined filter effluent turbidity limits in § 805.

B. Requirements for strengthened combined filter effluent turbidity limits

1. Public water systems must meet two strengthened combined filter effluent turbidity limits.

   a. The first combined filter effluent turbidity limit is a "95th percentile" turbidity limit that public water systems must meet in at least 95 percent of the turbidity measurements taken each month. Measurements must continue to be taken as described in Appendix D, 801-D (A) and (C). Monthly reporting must be completed according to § 2108 (A). The following table describes the required limits for specific filtration technologies.

Table 2100.2 Required Limits for Specific Filtration Technologies
95^{th} Percentile

If the public water system consists of	The 95th percentile turbidity value is:
(1) Conventional Filtration or Direct Filtration	0.3 NTU
(2) All other "Alternative" Filtration	A value determined by the Director (not to exceed 1 NTU) based on the demonstration

	described in § 2106 (C).

b. The second combined filter effluent turbidity limit is a "maximum" turbidity limit which the public water system may at no time exceed during the month. Measurements must continue to be taken as described in Appendix D 801-D (A) and (C). Monthly reporting must be completed according to § 2108(A). The following table describes the required limits for specific filtration technologies.

Table 2100.3 Required Limits for Specific Filtration Technologies - Maximum Turbidity Limit

If the public water system consists of	The maximum turbidity value is:
(1) Conventional Filtration or Direct Filtration	1 NTU.
(2) All other "Alternative" Filtration	A value determined by the Director (not to exceed 5 NTU) based on the demonstration as described in § 2106 (C).

C. Requirements for "alternative filtration"

a. If the public water system consists of alternative filtration(filtration other than slow sand filtration, diatomaceous earth filtration, conventional filtration, or direct filtration), owners/operators are required to conduct a demonstration (see tables in § 2106 (B)(1)). Owners/operators must demonstrate to the Director, using pilot plant studies or other means, that the public water system's filtration, in combination with disinfection treatment, consistently achieves:

1. 99 percent removal of *Cryptosporidium* oocysts;

2. 99.9 percent removal and/or inactivation of *Giardia lamblia* cysts; and

3. 99.99 percent removal and/or inactivation of viruses.

b. [Reserved]

D. Requirements for lime softening

If lime softening is practiced, the owner/operator may acidify representative combined filter effluent turbidity samples prior to analysis using a protocol approved by the Director.

§ 2107 Individual Filter Turbidity Requirements

A. If the public water system is a Part VIII system serving fewer than 10,000 people and utilizing conventional filtration or direct filtration, the owner/operator must conduct continuous monitoring of turbidity for each individual filter at the public water system. The following requirements apply to continuous turbidity monitoring:

1. Monitoring must be conducted using an approved method in Appendix D 801-D (A);
2. Calibration of turbidimeters must be conducted using procedures specified by the manufacturer;
3. Results of turbidity monitoring must be recorded at least every 15 minutes;
4. Monthly reporting must be completed according to § 2108(A); and
5. Records must be maintained according to § 2108(B).

B. Requirements for turbidity monitoring if equipment fails

If there is a failure in the continuous turbidity monitoring equipment, the owner/operator must conduct grab sampling every four hours in lieu of continuous monitoring until the turbidimeter is back on-line. The owner/operator has 14 days to resume continuous monitoring before a violation is incurred.

C. Special provisions regarding individual filter turbidity monitoring

If the public water system only consists of two or fewer filters, the owner/operator may conduct continuous monitoring of combined filter effluent turbidity in lieu of individual filter effluent turbidity monitoring. Continuous monitoring must meet the same requirements set forth in § 2107 (A) (1) through (5) and (B).

D. Requirements for continuous turbidity monitoring

Follow-up action is required according to the following tables:

Table 2100.4 Requirements for Continuous Turbidity Monitoring

If	Owners/operators must
(a) The turbidity of an individual filter (or the turbidity of combined filter effluent (CFE) for systems with 2 filters that monitor CFE in lieu of individual filters) exceeds 1.0 NTU in two consecutive recordings 15 minutes apart.	Report to the Director by the 10th of the following month and include the filter number(s), corresponding date(s), turbidity value(s) which exceeded 1.0 NTU, and the cause (if known) for the exceedance(s).

Table 2100.5 Requirements for Continuous Turbidity Monitoring - Reporting

If a public water system was required to report to the Director	Owners/operators must
(b) For three months in a row and turbidity exceeded 1.0 NTU in two consecutive recordings 15 minutes apart at the same filter (or CFE for systems with 2 filters that monitor CFE in lieu of individual filters).	Conduct a self-assessment of the filter(s) within 14 days of the day the filter exceeded 1.0 NTU in two consecutive measurements for the third straight month unless a CPE as specified in paragraph (c) of this section was required. Systems with 2 filters that monitor CFE in lieu of individual filters must conduct a self assessment on both filters. The self-assessment must consist of at least the following components: assessment of filter performance; development of a filter profile; identification and prioritization of factors limiting filter performance; assessment of the applicability of corrections; and preparation of a filter self-assessment report. If a self-assessment is required, the date that it was triggered and the date that it was completed.
(c) For two months in a row and turbidity exceeded 2.0 BTU in 2 consecutive recordings 15 minutes apart at the same filter (or CFE for systems with 2 filters that monitor CFE in lieu of individual filters).	Arrange to have a comprehensive performance evaluation (CPE) conducted by the Director not later than 60 days following the day the filter exceeded 2.0 NTU in two consecutive measurements for the second straight month. If a CPE has been completed by the Director within the 12 prior months or the system and Director are jointly participating in an ongoing Comprehensive Technical Assistance (CTA) project at the system, a new CPE is not required. If conducted, a CPE must be completed and submitted to the Director no later than 120 days following the day the filter exceeded 2.0 NTU in two consecutive measurements for the second straight month.

E. Requirements for lime softening practices for individual filter turbidity monitoring

If the public water system utilizes lime softening, the owner/operator may apply to the Director for alternative turbidity exceedance levels for the levels specified in the table in § 2107 (D). Owners/operators must be able to demonstrate to the Director that higher turbidity levels are due to lime carryover only, and not due to degraded filter performance.

§ 2108 Reporting and Recordkeeping Requirements

A. This section requires owners/operators to report several items to the Director. The following table describes the items which must be reported and the frequency of reporting. Owners/operators are required to report the information described in the following table, if it is subject to the specific requirement shown in the first column.

Table 2100.6 Reporting Requirements

Corresponding requirement	Description of information to report	Frequency

(a) Combined Filter Effluent Requirements. (§§ 2106 (A)-(D))	(1) The total number of filtered water turbidity measurements taken during the month. (2) The number and percentage of filtered water turbidity measurements taken during the month which are less than or equal to the public water system's required 95th percentile limit. (3) The date and value of any turbidity measurements taken during the month which exceed the maximum turbidity value for the public water system's filtration system.	By the 10th of the following month. By the 10th of the following month. By the 10th of the following month.
(b) Individual Turbidity Requirements. (§§ 2107 (A)-(E))	(1) That the owner/operator conducted individual filter turbidity monitoring during the month. (2) The filter number(s), corresponding date(s), and the turbidity value(s) which exceeded 1.0 NTU during the month, but only if 2 consecutive measurements exceeded 1.0 NTU. (3) If a self-assessment is required, the date that it was triggered and the date that it was completed. (4) If a CPE is required, that the CPE is required and the date that it was triggered. (5) Copy of completed CPE report.	By the 10th of the following month. By the 10th of the following month. By the 10th of the following month (or 14 days after the self-assessment was triggered only if the self-assessment was triggered during the last four days of the month) By the 10th of the following month. Within 120 days after the CPE was triggered.
(c) Disinfection Profiling (§§ 2104 (A)-(G))	(1) Results of optional monitoring which show TTHM levels <0.064 mg/l and HAA5 levels <0.048 mg/l (Only if owner/operator wishes to forgo profiling) or that the owner/operator has begun disinfection profiling.	(i) For systems serving 500-9,999 by July 1, 2003; (ii) For systems serving fewer than 500 by January 1, 2004.
(d) Disinfection Benchmarking (§§ 2105 (A)-(E))	(1) A description of the proposed change in disinfection, the public water system's disinfection profile for Giardia lamblia (and, if necessary, viruses) and disinfection benchmark, and an analysis of how the proposed change will affect the current levels of disinfection.	Anytime the owner/operator is considering a significant change to its disinfection practice.

B. Recordkeeping

Owners/operators must keep several types of records based on the requirements of this section, in addition to recordkeeping requirements under § 806. The following table describes the necessary records, the length of time these records must be kept, and for which requirement the records pertain. Owners/operators are required to maintain records described in this table, if it is subject to the specific requirement shown in the first column.

Table 2100.7 Recordkeeping Requirements

Corresponding requirement	Description of necessary records	Duration of time records must be kept
(a) Individual Filter Turbidity Requirements (§§ 2107 (A)-(E))	Results of individual filter monitoring	At least 3 years.
(b) Disinfection Profiling (§§ 2104(A)-(G))	Results of Profile (including raw data and analysis)	Indefinitely.
(c) Disinfection Benchmarking (§§ 2105 (A)-(E))	Benchmark (including raw data and analysis)	Indefinitely.

Part XXIII
Stage 2 Disinfection Byproducts

§ 2301 GENERAL REQUIREMENTS

A. General. The regulations in this part establish monitoring and other requirements for achieving compliance with maximum contaminant levels based on locational running annual averages (LRAA) for total trihalomethanes (TTHM) and haloacetic acids-5 (HAA5), and for achieving compliance with maximum residual disinfectant residuals for chlorine and chloramine for certain consecutive systems.

B. Applicability. This part applies to community water systems (CWSs) and nontransient noncommunity water systems (NTNCWSs) that use a primary or residual disinfectant other than ultraviolet light or delivers water that has been treated with a primary or residual disinfectant other than ultraviolet light.

C. Schedule. CWSs and NTNCWSs must comply with the requirements in this subpart according to the schedule in Table 2300.1 based upon system type.

TABLE 2300.1 SCHEDULE REQUIREMENTS BASED ON PUBLIC WATER SYSTEM TYPE

Type of system	Date of compliance with Stage 2 DBP monitoring by: [1]
1. System serving ≥100,000	April 1, 2012.
2. System serving 50,000-99,999	October 1, 2012.
3. System serving 10,000-49,999	October 1, 2013.
4. System serving < 10,000	October 1, 2013 if no *Cryptosporidium* monitoring is required under §2402 (A)(4) or October 1, 2014 if *Cryptosporidium* monitoring is required under §2402 (A)(4) or (A)(6)
Other systems that are part of a combined distribution system	
5. Consecutive system or wholesale system	- at the same time as the system with the earliest compliance date in the combined distribution system.
6. Monitoring frequency is specified in § 2302 (A)(2). a If quarterly monitoring is required, the owner/operator must begin monitoring in the first full calendar quarter that includes the compliance date in this Table. b If monitoring is required at a frequency that is less than quarterly, the owner/operator must begin monitoring in the calendar month recommended in the IDSE report prepared under §2202 or §2203 or the calendar month identified in the Stage 2 DBP monitoring plan developed under §2303 no later than 12 months after the compliance date in this Table.	
7. If quarterly monitoring is required, the owner/operator must make compliance calculations at the end of the fourth calendar quarter that follows the compliance date and at the end of each subsequent quarter (or earlier if the LRAA calculated based on fewer than four quarters of data would cause the MCL to be exceeded regardless of the monitoring results of subsequent quarters). If monitoring is required at a frequency that is less than quarterly, the owner/operator must make compliance calculations beginning with the first compliance sample taken after the compliance date.	
8. For the purpose of the schedule in this Table, the Director may determine that the combined distribution system does not include certain consecutive systems based on factors such as receiving water from a wholesale system only on an emergency basis or receiving only a small percentage and small volume of water from a wholesale system. The Director may also determine that the combined distribution system does not include certain wholesale systems based on factors such as delivering water to a consecutive system only on an emergency basis or delivering only a small percentage and small volume of water to a consecutive system.	

		>5,000,000	per quarter	20	

[1] The Director may grant up to an additional 24 months for compliance with MCLs and operational evaluation levels if the system requires capital improvements to comply with an MCL.

D. Monitoring and Compliance.

1. Systems required to monitor quarterly. To comply with Stage 2 DBP MCLs in § 207 (B)(2), the owner/operator must calculate LRAAs for TTHM and HAA5 using monitoring results collected under this part and determine that each LRAA does not exceed the MCL. If the owner/operator fails to complete four consecutive quarters of monitoring, the owner/operator must calculate compliance with the MCL based on the average of the available data from the most recent four quarters. If more than one sample per quarter is collected at a monitoring location, the average of all samples taken in the quarter at that location to determine a quarterly average must be used in the LRAA calculation.

2. Systems required to monitor yearly or less frequently. To determine compliance with Stage 2 DBP MCLs in §207 (B)(2), the owner/operator must determine that each sample taken is less than the MCL. If any sample exceeds the MCL, the owner/operator must comply with the requirements of § 2306. If no sample exceeds the MCL, the sample result for each monitoring location is considered the LRAA for that monitoring location.

E. Violation. The public water system owner/operator is in violation of the monitoring requirements for each quarter that a monitoring result would be used in calculating an LRAA if the owner/operator fails to monitor.

§ 2302 ROUTINE MONITORING

A. Monitoring.

1. If an IDSE report was submitted, the owner/operator must begin monitoring at the locations and months that were recommended in the IDSE (Initial Distribution System Evaluation) report submitted under § 2206 following the schedule in § 2301 (C), unless the Director requires other locations or additional locations after its review. If a 40/30 certification was submitted under § 2204, the system qualified for a very small system waiver under § 2205, or the system is a nontransient noncommunity water system serving < 10,000, the owner/operator must monitor at the location(s) and dates identified in the monitoring plan in § 1103 (F), updated as required by § 2303.

2. The owner/operator must monitor at no fewer than the number of locations identified in Table 2300.2.

TABLE 2300.2 MINIMUM NUMBER OF MONITORING LOCATIONS (DISTRIBUTION SYSTEM MONITORING)

Distribution System Monitoring			
Source Water Type	Population Size Category	Monitoring Frequency[1]	Distribution System Monitoring Location Total per monitoring period[2]
Surface Water	< 500	Per year	2
	500-3.300	per quarter	2
	3,301-9,999	per quarter	2
	10,000-49,999	Per quarter	4
	50,000-249,999	per quarter	8
	250,000-999,999	per quarter	12
	1,000,000-4,999,999	per quarter	16
	≥5,000,000	per quarter	20
Ground Water:	<500	per year	2
	500-9,999	per year	2
	10,000-99,999	per quarter	4

	100,000-499,999	per quarter	6
	≥5,000,000	per quarter	8

[1] All systems must monitor during the month of highest DBP concentrations.
[2] Systems on quarterly monitoring must take dual sample sets every 90 days at each monitoring location, except for Part VIII systems serving 500-3,300 persons. Ground water systems serving 500-9,999 persons on annual monitoring must take dual sample sets at each monitoring location. All other systems on annual monitoring and Part VIII systems serving 500-3,300 persons are required to take individual TTHM and HAA5 samples (instead of a dual sample set) at the locations with the highest TTHM and HAA5 concentrations, respectively. For systems serving fewer than 500 people, only one location with a dual sample set per monitoring period is needed if highest TTHM and HAA5 concentrations occur at the same location ~~(~~and month~~, if monitored annually)~~.

3. If an undisinfected system begins using a disinfectant other than UV light after the dates in Part XXII of these regulations for complying with the IDSE requirements, the owner/operator must consult with the Director to identify compliance monitoring locations for this part. A monitoring plan must be developed under § 2303 that includes those monitoring locations.

B. Analytical methods. The owner/operator must use an approved method listed in Appendix E-1101-E for TTHM and HAA5 analyses in this part. Analyses must be conducted by laboratories that have received certification by EPA or the Director as specified in Appendix E-1101-E.

§ 2303 STAGE 2 DBP MONITORING PLAN

A. 1. The public water system owner/operator must develop and implement a monitoring plan to be kept on file for the Director's and public review. The monitoring plan must contain the elements in paragraphs (A)(1)(a) through (A)(1)(d) of this section and be complete no later than the date that initial monitoring is conducted under this part.

a. Monitoring locations;

b. Monitoring dates;

c. Compliance calculation procedures; and

d. Monitoring plans for any other systems in the combined distribution system if the Director has reduced monitoring requirements under the Director's authority in 40 CFR § 142.16(m).

2. If the public water system was not required to submit an IDSE report under either § 2202 or § 2203, and the owner/operator does not have sufficient Part XI monitoring locations to identify the required number of Stage 2 DBP compliance monitoring locations indicated in § 2206 (B), the owner/operator must identify additional locations by alternating selection of locations representing high TTHM levels and high HAA5 levels until the required number of compliance monitoring locations have been identified. The owner/operator must also provide the rationale for identifying the locations as having high levels of TTHM or HAA5. If the public water system has more Part XI monitoring locations than required for Stage 2 DBP compliance monitoring in § 2206 (B), the owner/operator must identify which locations to use for Stage 2 DBP compliance monitoring by alternating selection of locations representing high TTHM levels and high HAA5 levels until the required number of Stage 2 DBP compliance monitoring locations have been identified.

B. If the public water system is a Part VIII system serving > 3,300 people, the owner/operator must submit a copy of the monitoring plan to the Director prior to the date that it will conduct initial monitoring under this part, unless an IDSE report submitted under Part XXII of these regulations contains all the information required by this section.

C. The owner/operator may revise the public water system's monitoring plan to reflect changes in treatment, distribution system operations and layout (including new service areas), or other factors that may affect TTHM or HAA5 formation, or for Director-approved reasons, after consultation with the Director regarding the need for changes and the appropriateness of changes. If the owner/operator changes monitoring locations, the owner/operator must replace existing compliance monitoring locations with the lowest LRAA with new locations that reflect the current distribution system locations with expected high TTHM or HAA5 levels. The Director may also require modifications in the monitoring plan. If the system is a Part VIII system serving > 3,300 people, the owner/operator must submit a copy of a modified monitoring plan to the Director prior to the date the public water system is required to comply with the revised

monitoring plan.

§ 2304 REDUCED MONITORING

A. The owner/operator may reduce monitoring to the level specified in Table 2300.3 any time the LRAA is ≤0.040 mg/L for TTHM and ≤0.030 mg/L for HAA5 at all monitoring locations. The owner/operator may only use data collected under the provisions of this part or Part XI to qualify for reduced monitoring. In addition, the source water annual average TOC level, before any treatment, must be ≤4.0 mg/L at each treatment plant treating surface water or ground water under the direct influence of surface water, based on monitoring conducted under either § 1103 (B)(1)(c) or § 1103 (D).

TABLE 2300.3 REDUCED MONITORING FREQUENCY AND MONITORING LOCATIONS PER MONITORING PERIOD FOR DISTRIBUTION SYSTEMS

Distribution System			
Source water type	Population size category	Monitoring Frequency[1]	Distribution System Monitoring location per monitoring period
Surface Water	<500	.....	Monitoring may not be reduced
	500-3,300	per year	1 TTHM and 1 HAA5 sample: one at the location and during the quarter with the highest TTHM single measurement, one at the location and during the quarter with the highest HAA5 single measurement; 1 dual sample set per year if the highest TTHM and HAA5 measurements occurred at the same location and quarter.
	3,301-9,999	per year	2 dual sample sets: one at the location and during the quarter with the highest TTHM single measurement, one at the location and during the quarter with the highest HAA5 single measurement.
	10,000-49,999	per quarter	2 dual sample sets at the locations with the highest TTHM and highest HAA5 LRAAs.
	50,000-249,999	per quarter	4 dual sample sets--at the locations with the two highest TTHM and two highest HAA5 LRAAs.
	250,000-999,999	per quarter	6 dual sample sets--at the locations with the three highest TTHM and three highest HAA5 LRAAs.
	1,000,000-4,999,999	per quarter	8 dual sample sets--at the locations with the four highest TTHM and four highest HAA5 LRAAs.
	≥5,000,000	per quarter	10 dual sample sets--at the locations with the five highest TTHM and five highest HAA5 LRAAs.

Distribution System			
Source Water Type	Population size category	Monitoring Frequency[1]	Distribution System Monitoring location per monitoring period
Ground Water	< 500	every third year	1 TTHM and 1 HAA5 sample: one at the location and during the quarter with the highest TTHM single measurement, one at the location and during the quarter with the highest HAA5 single measurement; 1 dual sample set per

			year if the highest TTHM and HAA5 measurements occurred at the same location and quarter.
	500-9,999	per year	1 TTHM and 1 HAA5 sample: one at the location and during the quarter with the highest TTHM single measurement, one at the location and during the quarter with the highest HAA5 single measurement; 1 dual sample set per year if the highest TTHM and HAA5 measurements occurred at the same location and quarter.
	10,000-99,999	per year	2 dual sample sets: one at the location and during the quarter with the highest TTHM single measurement, one at the location and during the quarter with the highest HAA5 single measurement.
	100,000-499,999	per quarter	2 dual sample sets; at the locations with the highest TTHM and highest HAA5 LRAAs.
	≥500,000	per quarter	4 dual sample sets at the locations with the two highest TTHM and two highest HAA5 LRAAs.

[1] Systems on quarterly monitoring must take dual sample sets every 90 days.

B. The public water system may remain on reduced monitoring as long as the TTHM LRAA is ≤0.040 mg/L and the HAA5 LRAA is ≤0.030 mg/L at each monitoring location (for systems with quarterly reduced monitoring) or each TTHM sample is ≤0.060 mg/L and each HAA5 sample is ≤0.045 mg/L (for systems with annual or less frequent monitoring). In addition, the source water annual average TOC level, before any treatment, must be ≤4.0 mg/L at each treatment plant treating surface water or ground water under the direct influence of surface water, based on monitoring conducted under either § 1103(B)(1)(c) or §1103(D).

C. If the LRAA based on quarterly monitoring at any monitoring location exceeds either 0.040 mg/L for TTHM or 0.030 mg/L for HAA5 or if the annual (or less frequent) sample at any location exceeds either 0.060 mg/L for TTHM or 0.045 mg/L for HAA5, or if the source water annual average TOC level, before any treatment, is >4.0 mg/L at any treatment plant treating surface water or ground water under the direct influence of surface water, the owner/operator must resume routine monitoring under §2302 or begin increased monitoring if §2306 applies.

D. The Director may return the public water system to routine monitoring at his/her discretion.

§ 2305 ADDITIONAL REQUIREMENTS FOR CONSECUTIVE SYSTEMS

If the public water system is a consecutive system that does not add a disinfectant but delivers water that has been treated with a primary or residual disinfectant other than ultraviolet light, the owner/operator must comply with analytical and monitoring requirements for chlorine and chloramines in Appendix E, 1101-E(C) and §1103(C)(1) and the compliance requirements in § 1104(C)(1) beginning April 1, 2009, unless required earlier by the Director, and report monitoring results under § 1105(C).

§ 2306 CONDITIONS REQUIRING INCREASED MONITORING

A. If the public water system is required to monitor at a particular location annually or less frequently than annually under § 2302 or § 2304, the owner/operator must increase monitoring to dual sample sets once per quarter (taken every 90 days) at all locations if a TTHM sample is >0.080 mg/L or a HAA5 sample is >0.060 mg/L at any location.

B. The owner/operator is in violation of the MCL when the LRAA exceeds the Stage 2 DBP MCLs in 207(B)(2), calculated based on four consecutive quarters of monitoring (or the LRAA calculated based on fewer than four quarters of data if the MCL would be exceeded regardless of the monitoring results of subsequent quarters). The owner/operator is in violation of the monitoring requirements for each quarter that a monitoring result would be used in calculating an LRAA if the owner/operator fails to monitor.

C. The public water system may return to routine monitoring once the owner/operator has conducted increased monitoring for at least four consecutive quarters and the LRAA for every monitoring

location is ≤0.060 mg/L for TTHM and ≤0.045 mg/L for HAA5.

§ 2307 OPERATIONAL EVALUATION LEVELS

A. The public water system has exceeded the operational evaluation level at any monitoring location where the sum of the two previous quarters' TTHM results plus twice the current quarter's TTHM result, divided by 4 to determine an average, exceeds 0.080 mg/L, or where the sum of the two previous quarters' HAA5 results plus twice the current quarter's HAA5 result, divided by 4 to determine an average, exceeds 0.060 mg/L.

B. 1. If the public water system exceeds the operational evaluation level, the owner/operator must conduct an operational evaluation and submit a written report of the evaluation to the Director no later than 90 days after being notified of the analytical result that causes the public water system to exceed the operational evaluation level. The written report must be made available to the public upon request.

2. The public water system's operational evaluation must include an examination of system treatment and distribution operational practices, including storage tank operations, excess storage capacity, distribution system flushing, changes in sources or source water quality, and treatment changes or problems that may contribute to TTHM and HAA5 formation and what steps could be considered to minimize future exceedances.

a. The owner/operator may request and the Director may allow the owner/operator to limit the scope of an evaluation if the owner/operator is able to identify the cause of the operational evaluation level exceedance.

b. The public water system's request to limit the scope of the evaluation does not extend the schedule in paragraph (B)(1) of this section for submitting the written report. The Director must approve this limited scope of evaluation in writing and the owner/operator must keep that approval with the completed report.

§ 2308 REQUIREMENTS FOR REMAINING ON REDUCED TTHM AND HAA5 MONITORING BASED ON PART XI RESULTS

The public water system may remain on reduced monitoring after the dates identified in § 2301 (C) for compliance with this part only if the public water system qualifies for a 40/30 certification under § 2204 or has received a very small system waiver under §2205, plus it meets the reduced monitoring criteria in § 2304 (A), and the owner/operator does not change or add monitoring locations from those used for compliance monitoring under Part XI of these regulations. If the public water system's monitoring locations under this part differ from the system's monitoring locations under Part XI of these regulations, the system may not remain on reduced monitoring after the dates identified in §2301(C) for compliance with this part.

§ 2309 REQUIREMENTS FOR REMAINING ON INCREASED TTHM AND HAA5 MONITORING BASED ON PART XI RESULTS

If the public water system was on increased monitoring under §1103 (B)(1), it must remain on increased monitoring until the system qualifies for a return to routine monitoring under §2306 (C). The owner/operator must conduct increased monitoring under § 2306 at the monitoring locations in the monitoring plan developed under §2303 beginning on the date identified in §2301 (C) for compliance with this part and must remain on increased monitoring until the system qualifies for a return to routine monitoring under § 2306 (C).

§ 2310 REPORTING AND RECORDKEEPING REQUIREMENTS

A. Reporting.

1. The owner/operator must report the following information for each monitoring location to the Director within 10 days of the end of any quarter in which monitoring is required:

a. Number of samples taken during the last quarter.

b. Date and results of each sample taken during the last quarter.

c. Arithmetic average of quarterly results for the last four quarters for each monitoring location (LRAA), beginning at the end of the fourth calendar quarter that follows the compliance date and at the end of each subsequent quarter. If the LRAA calculated based on fewer than four quarters of data would cause the MCL to be exceeded regardless of the monitoring results of subsequent quarters, the owner/operator must report this information to the Director as part of the first report due following the compliance date or anytime thereafter that this determination is made. If the system is required to conduct monitoring at a frequency that is less than quarterly, the owner/operator must make compliance calculations beginning with the first compliance sample taken after the compliance

date, unless the owner/operator is required to conduct increased monitoring under §2306.

d. Whether, based on § 207(B)(2) and this subpart, the MCL was violated at any monitoring location.

e. Any operational evaluation levels that were exceeded during the quarter and, if so, the location and date, and the calculated TTHM and HAA5 levels.

2. If the public water system is a Part VIII system seeking to qualify for or remain on reduced TTHM/HAA5 monitoring, the owner/operator must report the following source water TOC information for each treatment plant that treats surface water or ground water under the direct influence of surface water to the Director within 10 days of the end of any quarter in which monitoring is required:

a. The number of source water TOC samples taken each month during the last quarter.

b. The date and result of each sample taken during the last quarter.

c. The quarterly average of monthly samples taken during last quarter or the result of the quarterly sample.

d. The running annual average (RAA) of quarterly averages from the past four quarters.

e. Whether the RAA exceeded 4.0 mg/L.

3. The Director may choose to perform calculations and determine whether the MCL was exceeded or the system is eligible for reduced monitoring in lieu of having the system report that information.

B. Recordkeeping. The public water system owner/operator must retain any Stage 2 DBP monitoring plans and Stage 2 DBP monitoring results as required by § 503.

Part XXV
Groundwater

§2501 ~~Groundwater Sampling and Analytical Requirements~~ General Requirements and Applicability

A Scope.

These regulations constitute a primary drinking water regulation.

~~A.~~B. Applicability.

This part applies to all groundwater systems, which are defined as all public water systems that use groundwater, including consecutive systems receiving finished groundwater, except for public water systems that combine all of their groundwater with surface water or with groundwater under the direct influence of surface water prior to treatment under Part VIII of these regulations. For the purposes of this part, "ground water system" is defined as any public water system meeting this applicability statement.

~~B.~~C. General Requirements.

All groundwater systems must comply with the following requirements:

1. Sanitary survey information requirements for all groundwater systems as described in §303.

2. Microbial source water monitoring requirements for groundwater systems that do not treat all of their groundwater to at least 99.99% (4-log) treatment of viruses (using inactivation, removal, or an approved combination of 4-log virus inactivation and removal) before or at the first customer as described in §2503.

3. Treatment technique requirements, described in §2504, that apply to groundwater systems that have fecally contaminated source waters, as determined by source water monitoring conducted under §2503, or that have significant deficiencies that are identified by the Director. A groundwater system with fecally contaminated source water or with significant deficiencies subject to the treatment technique requirements of this part must implement one or more of the following corrective action options:

   a. correct all significant deficiencies;
   b. provide an alternate source of water;
   c. eliminate the source of contamination; or
   d. provide treatment that reliably achieves at least 4-log treatment of viruses (using inactivation, removal, or an approved combination of 4-log virus inactivation and removal) before or at the first customer.

4. Groundwater systems that provide at least 4-log treatment of viruses (using inactivation, removal, or an approved combination of 4-log virus inactivation and removal) before or at the first customer are required to conduct compliance monitoring to demonstrate treatment effectiveness, as described in §2503(B).

5. If requested by the Director, groundwater systems must provide the Director with any existing information that will enable the Director to perform a hydrogeologic sensitivity assessment. For the purposes of this part, "hydrogeologic sensitivity assessment" is a determination of whether groundwater systems obtain water from hydrogeologically sensitive settings.

~~C.~~D. Compliance date.

Unless otherwise noted, groundwater systems must comply with the requirements of this part ~~upon approval of this part by the Navajo Nation Resources Committee.~~ beginning July 8, 2010.

§2502 Sanitary Surveys for Groundwater Systems.

A. Groundwater systems must provide the Director, at the Director's request, any existing information that will enable the PWSSP to conduct a sanitary survey as prescribed in § 300.

B. For the purposes of this subpart, a "sanitary survey," as conducted by the PWSSP, includes but is not limited to, an onsite review of the water source(s) (identifying sources of contamination by using results of source water assessments or other relevant information where available), facilities, equipment, operation, maintenance, and monitoring compliance of a public water system to evaluate the adequacy of the system, its sources and operations and the distribution of safe drinking water.

C. The sanitary survey must include an evaluation of the applicable components listed below:
   1. Source;
   2. Treatment;
   3. Distribution system;
   4. Finished water storage;
   5. Pumps, pump facilities, and controls;
   6. Monitoring, reporting, and data verification;
   7. System management and operation; and
   8. Operator compliance with PWSSP requirements.

§2503 Groundwater Source Microbial Monitoring and Analytical Methods.

A. Triggered Source Water Monitoring.

1. General requirements

A groundwater system must conduct triggered source water monitoring if the conditions identified in paragraphs (A)(1)(a) and (A)(1)(b) of this section exist.

a. The system does not provide at least 4-log treatment of viruses (using inactivation, removal, or an approved combination of 4-log virus inactivation and removal) before or at the first customer for each groundwater source; and

b. The system is notified that a sample collected under §404(A) is total coliform-positive and the sample is not invalidated under §404(D).

2. Sampling Requirements.

A groundwater system must collect, within 24 hours of notification of the total coliform-positive sample, at least one groundwater source sample from each groundwater source in use at the time the total coliform-positive sample was collected under §404(A), except as provided in paragraph (A)(2)(b) of this section.

a. The Director may extend the 24-hour time limit, on a case-by-case basis, if the system cannot collect the groundwater source water sample within 24 hours due to circumstances beyond its control. In the case of an extension, the Director must specify how much time the system has to collect the sample.

b. If approved by the Director, systems with more than one groundwater source may meet the requirements of this paragraph (A)(2) by sampling a representative groundwater source or sources. If required by the Director, systems must submit for Director approval a triggered source water monitoring plan that identifies one or more groundwater sources that are representative of each monitoring site in the system's sample siting plan under §404(A) and that the system intends to use for representative sampling under this paragraph (A)(2).

c. A groundwater system serving 1,000 people or fewer may use a repeat sample collected from a groundwater source to meet both the requirements of §404(B) and to satisfy the monitoring requirements of paragraph (A)(2) of this section for that groundwater source only if the Director approves the use of E. coli as a fecal indicator for source water monitoring under subsection (A) of this section. If the repeat sample collected from the groundwater source is E. coli positive, the system must comply with paragraph (A)(3) of this section.

3. Additional Requirements.

If the Director does not require corrective action under §2504(A)(2) for a fecal indicator-positive source water sample collected under paragraph (A)(2) of this section that is not invalidated under (D) of this section, the system must collect five additional source water samples from the same source within 24 hours of being notified of the fecal indicator-positive sample.

4. Consecutive and Wholesale Systems.

   a. In addition to the other requirements of this subsection (A), a consecutive groundwater system that has a total coliform-positive sample collected under §404(A) must notify the wholesale system(s) within 24 hours of being notified of the total coliform sample.

   b. In addition to the other requirements of subsection (A) of this section, a wholesale groundwater system must comply with paragraphs (A)(4)(b)(i) and (A)(4)(b)(ii) of this section.

      i. A wholesale groundwater system that receives notice from a consecutive system it serves that a sample collected under §404(A) is total coliform-positive must, within 24 hours of being notified, collect a sample from its groundwater source(s) under paragraph (A)(2) of this section and analyze it for a fecal indicator under subsection (C) of this section.

      ii. If the sample collected under paragraph (A)(4)(b)(i) of this section is fecal indicator-positive, the wholesale groundwater system must notify all consecutive systems served by that groundwater source of the fecal indicator source water positive within 24 hours of being notified of the groundwater source sample monitoring result and must meet the requirements of paragraph (A)(3) of this section.

5. Exceptions to the Triggered Source Water Monitoring Requirements.

   A groundwater system is not required to comply with the source water monitoring requirements of subsection (A) of this section if either of the following conditions exists:

   a. The Director determines, and documents in writing, that the total coliform-positive sample collected under §404(A) is caused by a distribution system deficiency; or

   b. The total coliform-positive sample collected under §404(A) is collected at a location that meets Director-approved criteria for distribution system conditions that will cause total coliform-positive samples.

B. Assessment Source Water Monitoring.

If required by the Director, groundwater systems must conduct assessment source water monitoring that meets Director-determined requirements for such monitoring. A groundwater system conducting assessment source water monitoring may use a triggered source water sample collected under paragraph (A)(2) of this section to meet the requirements of this subsection (B). Assessment source water monitoring requirements may include:

1. Collection of a total of 12 groundwater source samples that represent each month the system provides groundwater to the public,

2. Collection of samples from each well unless the system obtains written Director approval to conduct monitoring at one or more wells within the groundwater system that are representative of multiple wells used by that system and that draw water from the same hydrogeologic setting,

3. Collection of a standard sample volume of at least 100 mL for fecal indicator analysis regardless of the fecal indicator or analytical method used,

4. Analysis of all groundwater source samples using one of the analytical methods listed in paragraph (C)(2) of this section for the presence of E. coli, enterococci, or coliphage,

5. Collection of groundwater source samples at a location prior to any treatment of the groundwater source unless the Director approves a sampling location after treatment, and

6. Collection of groundwater source samples at the well itself unless the systems's configuration does not allow for sampling at the well itself and the Director approves an alternate sampling location that is representative of the water quality of that well.

C. Analytical Methods.

1. A groundwater system subject to the source water monitoring requirement of subsection (A) of this section must collect a standard sample volume of at least 100mL for fecal indicator analysis regardless of the fecal indicator or analytical method used.

2. A groundwater system must analyze all groundwater sources samples collected under subsection (A) of this section using one of the analytical methods listed in Appendix H for the presence of E. Coli, enterococci, or coliphage.

D. Invalidation of a Fecal Indicator-Positive Groundwater Source Sample.

1. A groundwater system may obtain Director invalidation of a fecal indicator-positive groundwater source sample collected under subsection (A) of this section only under the conditions specified in paragraphs (D)(1)(a) and (b) of this section.

   a. The system provides the Director with written notice from the laboratory that improper sample analysis occurred; or

   b. The Director determines and documents in writing that there is substantial evidence that a fecal indicator-positive groundwater source sample is not related to source water quality.

2. If the Director invalidates a fecal indicator-positive groundwater source sample, the groundwater system must collect another source water sample under subsection (A) of this section within 24 hours of being notified by the Director of its invalidation decision and have it analyzed for the same fecal indicator using the analytical methods in Appendix H of these regulations. The Director may extend the 24-hour time limit on a case-by-case basis if the system cannot collect the source water sample within 24 hours due to circumstances beyond its control. In the case of an extension the Director must specify how much time the system has to collect the sample.

E. Sampling Location.

1. Any groundwater source sample required under subsection (A) of this section must be collected at a location prior to any treatment of the groundwater source unless the Director approves a sampling location after treatment.

2. If the system's configuration does not allow for sampling at the well itself, the system may collect a sample at a Director-approved location to meet the requirements of subsection (A) of this section if the sample is representative of the water quality of that well.

F. New Sources.

If required by the Director, a groundwater system that places a new groundwater source into service after November 30, 2009, must conduct assessment source water monitoring under subsection (B) of this section. If required by the Director, the system must begin monitoring before the groundwater source is used to provide water to the public.

G. Public Notification.

A groundwater system with a groundwater source sample collected under subsection (A) or (B) of this section that is fecal indicator-positive and that is not invalidated under subsection (D) of this section, including consecutive systems served by the groundwater source, must conduct public notification under §603.

H. Monitoring Violations.

Failure to meet the requirements of subsections (A)-(F) of this section is a monitoring violation and requires the groundwater system to provide public notification under §605.

§2504 Treatment Technique Requirements for Groundwater Systems

A. Groundwater Systems with Significant Deficiencies or Source Water Fecal Contamination.

1. The treatment technique requirements of this section must be met by groundwater systems when a significant deficiency is identified or when a groundwater source sample collected under §2503(A)(3) is fecal indicator-positive.

2. If required by the Director, a groundwater system with a groundwater source sample

collected under §2503(A)(2), §2503(A)(4), or §2503(B) that is fecal indicator-positive must comply with the treatment technique requirements of this section.

3. When a significant deficiency is identified at a Part 800 public water system that uses both groundwater and surface water or groundwater under the direct influence of surface water, the system must comply with the provisions of this paragraph except in cases where the Director determines that the significant deficiency is in a portion of the distribution system that is served solely by surface water or groundwater under the direct influence of surface water.

4. Unless the Director requires the groundwater system to implement a specific corrective action, the groundwater system must consult with the Director regarding the appropriate corrective action within 30 days of receiving written notice from the Director of a significant deficiency, written notice from a laboratory that a groundwater source sample collected under §2503(A)(3) was found to be fecal indicator-positive, or written notice from the Director that a fecal indicator-positive collected under §2503(A)(2), §2503(A)(4), or §2503(B) requires corrective action. For the purposes of this part, significant deficiencies include, but are not limited to, defects in design, operation, or maintenance, or failure or malfunction of the sources, treatment, storage, or distribution system that the Director determines to be causing, or have potential for causing, the introduction of contamination into the water delivered to consumers.

5. Within 120 days (or earlier if required by the Director) of receiving written notification from the Director of a significant deficiency, written notice from a laboratory that a groundwater source sample collected under §2503(A)(3) was found to be fecal indicator-positive, or written notice from the Director that a fecal indicator-positive sample collected under §2503(A)(2), §2503(A)(4), or §2503(B) requires corrective action, the groundwater system must either:

   a. Have completed corrective action in accordance with applicable PWSSP plan review processes or other guidance or direction, if any, including Director-specified interim measures; or

   b. Be in compliance with a Director-approved corrective action plan and schedule subject to the conditions specified in (A)(5)(b)(i) and (A)(5)(b)(ii) of this section.

      i. Any subsequent modifications to an approved corrective action plan and schedule must also be approved by the Director.

      ii. If the Director specifies interim measures for protection of the public health pending Director approval of the corrective action plan and schedule or pending completion of the corrective action plan, the system must comply with these interim measures as well as with any schedule specified by the Director.

6. Corrective Action Alternatives.

   Groundwater systems that meet the conditions of paragraph (A)(1) or (A)(2) of this section must implement one or more of the following corrective action alternatives:

   a. Correct all significant deficiencies;

   b. Provide an alternate source of water;

   c. Eliminate the source of contamination; or

   d. Provide treatment that reliably achieves at least 4-log treatment of viruses (using inactivation, removal, or a Director-approved combination of 4-log virus inactivation and removal) before or at the first customer for the groundwater source.

7. Special Notice to the Public of Significant Deficiencies or Source Water Fecal Contamination.

   a. In addition to the applicable public notification requirements of §2503, a community groundwater system that receives notice from the Director of a significant deficiency or notification of a fecal indicator-positive groundwater source sample that is not invalidated by the Director under §2503(D) must inform the public served by the water system under §1204(H)(6) of the fecal indicator-positive source sample or of any significant deficiency that has not been corrected. The system must continue to inform the public annually until the

significant deficiency is corrected or the fecal contamination in the groundwater source is determined by the Director to be corrected under paragraph (A)(5) of this section.

b. In addition to the applicable public notification requirements of §603, a non-community groundwater system that receives notice from the Director of a significant deficiency must inform the public served by the water system in a manner approved by the Director of any significant deficiency that has not been corrected within 12 months of being notified by the Director, or earlier if required by the Director. The system must continue to inform the public annually until the significant deficiency is corrected. The information must include:

i. The nature of the significant deficiency and the date the significant deficiency was identified by the Director;

ii. The Director-approved plan and schedule for correction of the significant deficiency, including interim measures, progress to date, and any interim measures completed; and

iii. For systems with a large proportion of non-English speaking consumers, as determined by the Director, information in the appropriate language(s) regarding the importance of the notice or a telephone number or address where consumers may contact the system to obtain a translated copy of the notice or assistance in the appropriate language.

c. If required by the Director, a non-community water system with significant deficiencies that have been corrected must inform its customers of the significant deficiencies, how the deficiencies were corrected, and the dates of correction under paragraph (A)(7)(b) of this section.

B. Compliance Monitoring.

1. Existing Groundwater Sources.

A groundwater system that is not required to meet the source water monitoring requirements of this part for any groundwater source because it provides at least 4-log treatment of viruses (using inactivation, removal, or a Director-approved combination of 4-log virus inactivation and removal) before or at the first customer for any groundwater source before the compliance date of this part, must notify the Director in writing that it provides at least 4-log treatment of viruses (using inactivation, removal, or a Director-approved combination of 4-log virus inactivation and removal) before or at the first customer for the specified groundwater source and being compliance monitoring in accordance with paragraph (B)(3) of this section by the compliance date for this part. Notification to the Director must include engineering, operational, or other information that the Director requests to evaluate the submission. If the system subsequently discontinues 4-log treatment of viruses (using inactivation, removal, or a Director-approved combination of 4-log virus inactivation and removal) before or at the first customer for a groundwater source, the system must conduct groundwater source monitoring as required under §2503.

2. New Groundwater Sources.

A groundwater system that places a groundwater source in service on or after the compliance date for this part that is not required to meet the source water monitoring requirements of this part because the system provides at least 4-log treatment of viruses (using inactivation, removal, or a Director approved combination of 4-log virus inactivation and removal) before or at the first customer for the groundwater source must comply with the requirements of paragraphs (B)(2)(a), (B)(2)(b), and (B)(2)(C) of this section.

a. The system must notify the Director in writing that it provides at least 4-log treatment of viruses (using inactivation, removal, or a Director-approved combination of 4-log virus inactivation and removal) before or at the first customer for the groundwater source. Notification to the Director must include engineering, operational, or other information that the Director requests to evaluate the submission.

b. The system must conduct compliance monitoring as required under §2504(B)(3) of this part within 30 days of placing the source in service.

c. The system must conduct groundwater source monitoring under §2503 if the system

subsequently discontinues 4-log treatment of viruses (using inactivation, removal, or a Director-approved combination of 4-log virus inactivation and removal) before or at the first customer for the groundwater source.

3. Monitoring Requirements.

A groundwater system subject to the requirements of subsection (A) or paragraph (B)(1) or (B)(2) of this section must monitor the effectiveness and reliability of treatment for that groundwater source before or at the first customer as follows:

a. Chemical Disinfection

i. Groundwater systems serving more than 3,300 people.

A groundwater system that serves more than 3,300 people must continuously monitor the residual disinfectant concentration using analytical methods specified in Appendix D, §801-D (A)(2) at a location approved by the Director and must record the lowest residual disinfectant concentration each day that water from the groundwater source is served to the public. The groundwater system must maintain the Director-determined residual disinfectant concentration every day the groundwater system serves water from the groundwater source to the public. If there is a failure in the continuous monitoring equipment, the groundwater system must conduct grab sampling every four hours until the continuous monitoring equipment is returned to service. The system must resume continuous residual disinfectant monitoring within 14 days.

ii. Groundwater systems serving 3,300 or fewer people.

A groundwater system that serves 3,300 or fewer people must monitor the residual disinfectant concentration using analytical methods specified in Appendix D, §801-D (A)(2) at a location approved by the Director and record the residual disinfection concentration each day that water from the groundwater source is served to the public. The groundwater system must maintain the Director-determined residual disinfectant concentration every day the groundwater system serves water from the groundwater source to the public. The groundwater system must take a daily grab sample during the hour of peak flow or at another time specified by the Director. If any daily grab sample measurement falls below the Director-determined residual disinfectant concentration, the groundwater system must take follow-up samples every four hours until the residual disinfectant concentration is restored to the Director-determined level. Alternatively, a groundwater system that serves 3,300 or fewer people may monitor continuously and meet the requirements of paragraph (B)(3)(a)(i) of this section.

b. Membrane Filtration

A groundwater system that uses membrane filtration to meet the requirements of this part must monitor the membrane filtration process in accordance with all Director-specified monitoring requirements and must operate the membrane filtration in accordance with all Director-specified compliance requirements. A groundwater system that uses membrane filtration is in compliance with the requirement to achieve at least 4-log removal of viruses when:

i. The membrane has an absolute molecular weight cut-off (MWCO), or an alternate parameter that describes the exclusion characteristics of the membrane, that can reliably achieve at least 4-log removal of viruses;

ii. The membrane process is operated in accordance with Director-specified compliance requirements; and

iii. The integrity of the membrane is intact.

c. Alternative Treatment

A groundwater system that uses a Director-approved alternative treatment to meet the requirements of this part by providing at least 4-log treatment of viruses (using inactivation, removal, or a Director-approved combination of 4-log virus inactivation and removal) before or at the first customer must:

i. Monitor the alternative treatment in accordance with all Director-specified monitoring requirements; and

ii. Operate the alternative treatment in accordance with all compliance requirements that the Director determines to be necessary to achieve at least 4-log treatment of viruses.

C. Discontinuing Treatment

A groundwater system may discontinue 4-log treatment of viruses (using inactivation, removal, or a Director-approved combination of 4-log virus inactivation and removal) before or at the first customer for a groundwater source if the Director determines and documents in writing that 4-log treatment of viruses is no longer necessary for that groundwater source. A system that discontinues 4-log treatment of viruses is subject to the source water monitoring and analytical methods requirements of §2503.

D. Failure to meet the monitoring requirements of subsection (B) of this section is a monitoring violation and requires the groundwater system to provide public notification under §605.

§2505 Treatment Technique Violations for Groundwater Systems

A. A groundwater system with a significant deficiency is in violation of the treatment technique requirement if, within 120 days (or earlier if required by the Director) of receiving written notice from the Director of the significant deficiency, the system:

1. Does not complete corrective action in accordance with any applicable PWSSP plan review processes or other guidance and direction, including Director-specified interim actions and measures, or

2. Is not in compliance with a Director-approved corrective action plan and schedule.

B. Unless the Director invalidates a fecal indicator-positive groundwater source sample under §2503(D), a groundwater system is in violation of the treatment technique requirement if, within 120 days (or earlier if required by the Director) of meeting the conditions of §2504(A)(1) or §2504(A)(2), the system:

1. Does not complete corrective action in accordance with any applicable PWSSP plan review processes or other guidance and direction, including Director-specified interim measures, or

2. Is not in compliance with a Director-approved corrective action plan and schedule.

C. A groundwater system subject to the requirements of §2504(B)(3) that fails to maintain at least 4-log treatment of viruses (using inactivation, removal, or a Director-approved combination of 4-log virus inactivation and removal) before or at the first customer for a groundwater source is in violation of the treatment technique requirement if the failure is not corrected within four hours of determining the system is not maintaining at least 4-log treatment of viruses before or at the first customer.

D. Groundwater systems must give public notification under §604 for the treatment technique violations specified in subsections (A), (B) and (C) of this section.

§2506 Reporting and Recordkeeping for Groundwater Systems

A. Reporting.

In addition to the requirements of §502, a groundwater system regulated under this part must provide the following information to the Director:

1. A groundwater system conducting compliance monitoring under §2504(B) must notify the Director any time the system fails to meet any Director-specified requirements including, but not limited to, minimum residual disinfectant concentration, membrane operating criteria or membrane integrity, and alternative treatment operating criteria, if operation in accordance with the criteria or requirements is not restored within four hours. The groundwater system must notify the Director as soon as possible, but in no case later than the end of the next business day.

2. After completing any corrective action under §2504(A), a groundwater system must notify the Director within 30 days of completion of the corrective action.

3. If a groundwater system subject to the requirements of §2503(A) does not conduct source

water monitoring under §2503(A)(5)(b), the system must provide documentation to the Director within 30 days of the total coliform positive sample that it met the Director-specified criteria.

B. Recordkeeping.

In addition to the requirements of §503, a groundwater system regulated under this part must maintain the following information in its records:

1. Documentation of corrective actions. Documentation shall be kept for a period of not less than 10 years.

2. Documentation of notice to the public as required under §2504(A)(7). Documentation shall be kept for a period of not less than three years.

3. Records of decisions under §2504(A)(5)(b) and records of invalidation of fecal indicator-positive groundwater source samples under §2503(D). Documentation shall be kept for a period of not less than five years.

4. For consecutive systems, documentation of notification to the wholesale system(s) of total-coliform positive samples that are not invalidated under §404 (D). Documentation shall be kept for a period of not less than five years.

5. For systems, including wholesale systems, that are required to perform compliance monitoring under §2504(B):

   a. Records of the Director-specified minimum disinfectant residual. Documentation shall be kept for a period of not less than ten years.

   b. Records of the lowest daily residual disinfectant concentration and records of the date and duration of any failure to maintain the Director-prescribed minimum residual disinfectant concentration for a period of more than four hours. Documentation shall be kept for a period of not less than five years.

   c. Records of Director-specified compliance requirements for membrane filtration and of parameters specified by the Director for Director-approved alternative treatment and records of the date and duration of any failure to meet the membrane operating, membrane integrity, or alternative treatment operating requirements for more than four hours. Documentation shall be kept for a period of not less than five years.

APPENDIX A[1]
SAMPLING AND ANALYTICAL METHODOLOGY

401-A ALTERNATIVE ANALYTICAL TECHNIQUES

With written permission of the Director, concurred in by the Administrator of the EPA, an alternate analytical technique may be employed. An alternate technique shall be accepted if it is substantially equivalent to the prescribed test in both precision and accuracy as it relates to the determination of compliance with any MCL. The use of the alternate analytical technique shall not decrease the frequency of sampling required by these regulations.

402-A MICROBIOLOGICAL SAMPLING AND ANALYTICAL REQUIREMENTS

A. ANALYTICAL METHODOLOGY

1. The standard sample volume required for total coliform analysis, regardless of analytical method used, is 100 ml.

2. Public water systems need only determine the presence or absence of total coliforms; a determination of total coliform density is not required.

3. Public water systems must conduct total coliform analyses in accordance with one of the analytical methods in the following table or one of the alternative methods listed in Appendix A to subpart C of 40 CFR pt. 141:

Table 400-A-1 Analytical Methods for Total Coliform

Organism	Methodology[1]	Citation[2]
Total coliforms[3]	Total Coliform Fermentation Technique [4,5,6] Total Coliform Membrane Filter Technique[7] Presence-Absence (P-A) Coliform Test [6,8] ONPG-MUG Test [9] Colisure Test [10] E*Colite® Test[11] m-ColiBlue24® Test[12]	9221 A, B 9222 A, B, C 9221 9223

The procedures shall be done in accordance with the documents listed below. Copies of the documents may be obtained from the sources listed below. Information regarding obtaining these documents can be obtained from the Safe Drinking Water Hotline at 800-426-4791. Documents may be inspected at EPA's Drinking Water Docket, 1200 North Capitol Street, NW, Suite 700, Washington D.C. 20460 (Telephone: 202-260-3027); or at the Office of the Federal Register, 800 North Capitol Street, NW, Suite 700, Washington D.C. 20408.

[1] EPA strongly recommends that laboratories evaluate the false-positive and negative rates for the method(s) they use for monitoring total coliforms. EPA also encourages laboratories to establish false-positive and false-negative rates within their own laboratory and sample matrix (drinking water or source water) with the intent that if the method they choose has an unacceptable false-positive or negative rate, another method can be used. The Agency suggests that laboratories perform these studies on a minimum of 5% of all total coliform-positive samples, except for those methods where verification/confirmation is already required, e.g., the M-Endo and LES Endo Membrane Filter Tests, Standard Total Coliform Fermentation Technique, and Presence-Absence Coliform Test. Methods for establishing false-positive and negative-rates may be based on lactose fermentation, the rapid test for β-galactosidase and cytochrome oxidase, multi-test identification systems, or equivalent confirmation tests. False-positive and false-negative information is often available in published studies and/or from the manufacturer(s).

[2] Methods 9221 A, B,; 9222 A, B, C; 9221 D and 9223 are contained in *Standard Methods for the Examination of Water and Wastewater,* 18th Edition (1992) and 19th Edition (1995) American Public Health Association,

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[1] In addition to all methods specifically referenced in the Appendices A - G, NNEPA incorporates by reference the methods identified by USEPA on its website as approved analytical methods, for the purposes for which those methods are identified, as those methods may be updated from time to time. The USEPA website may be found at: www.epa.gov/safewater.

1015 Fifteenth Street NW, Washington D.C. 20005; Either edition may be used.
[3] The time from sample collection to initiation of analysis may not exceed 30 hours. Systems are encouraged but not required to hold samples below 10°C during transit.
[4] Lactose broth, as commercially available, may be used in lieu of lauryl tryptose broth, if the system conducts at least 25 parallel tests between this medium and lauryl tryptose broth using the water normally tested, and this comparison demonstrates that the false-positive rate for total coliforms, using lactose broth, is less than 10%.
[5] If inverted tubes are used to detect gas production, the media should cover these tubes at least one-half to two-thirds after the sample is added.
[6] No requirements exist to run the completed phase on 10% of all total coliform-positive confirmed tubes.
[7] MI agar also may be used. Preparation and use of MI agar is set forth in the article, "New medium for the simultaneous detection of total coliform and *Escherichia coli* in water" by Brenner, K.P., et. al., 1993, Appl. Environ. Microbiol. 59:3534-3544. Also available from the Office of Water Resource Center (RC-4100), 401 M. Street SW, Washington, DC 20460, EPA/600/J-99/225.
[8] Six-times formulation strength may be used if the medium is filter-sterilized rather than autoclaved.
[9] The ONPG-MUG Test is sometimes referred to as the Autoanalysis Colilert System.
[10] A description of the Colisure Test, Feb 28, 1994, may be obtained from IDEXX Laboratories, Inc., One IDEXX Drive, Westbrook, Maine 04092. The Colisure Test may be read after an incubation time of 24 hours.
[11] A description of the E*Colite® Test, "Presence/Absence for Coliforms and *E. Coli* in Water," Dec 21, 1997 is available from Charm Sciences, Inc., 36 Franklin Street, Malden, MA 02148-4120.
[12] A description of the m-ColiBlue24® Test, Aug 17, 1999, is available from the Hach Company, 100 Dayton Avenue, Ames, IA 50010.

B. Public water systems must conduct fecal coliform analysis in accordance with the following procedure.

1. When the MTF Technique or Presence-Absence (PA) Coliform Test is used to test for total coliforms, shake the lactose-positive presumptive tube or P-A vigorously and transfer the growth with a sterile 3-mm loop or sterile applicator stick into brilliant green lactose bile broth and EC medium to determine the presence of total and fecal coliforms, respectively.

2. For EPA-approved analytical methods which use a membrane filter, transfer the total coliform-positive culture by one of the following methods:

   a. Remove the membrane containing the total coliform colonies from the substrate with a sterile forceps and carefully curl and insert the membrane into a tube of EC medium (the laboratory may first remove a small portion of selected colonies for verification), swab the entire membrane filter surface with a sterile cotton swab and transfer the inoculum to EC medium (do not leave the cotton swab in the EC medium), or inoculate individual total coliform-positive colonies into EC Medium. Gently shake the inoculated tubes of EC medium to insure adequate mixing and incubate in a waterbath at 44.5 ± 0.2°C for 24 ± 2 hours. Gas production of any amount in the inner fermentation tube of the EC medium indicates a positive fecal coliform test.

   b. The preparation of EC medium is described in the 18th edition (1992) and 19th edition (1995) of *Standard Methods for the Examination of Water and Wastewater*, Method 9221E (paragraph 1a), either edition may be used.

   c. Public water systems need only determine the presence or absence of fecal coliforms; a determination of fecal coliform density is not required.

C. Public water systems must conduct analysis of *Escherichia coli* in accordance with one of the following analytical methods **or one of the alternative methods listed in Appendix A to subpart C of 40 C.F.R. pt. 141:**

1. EC medium supplemented with 50 μg/ml of 4-methylumbelliferyl-beta-D-glucuronide (MUG) (final concentration). EC medium is described in as referenced in subsection (B)(2)(b) of this section. MUG may be added to EC medium before autoclaving. EC medium supplemented with 50 μg/ml of MUG is commercially available. At least 10 ml of EC medium supplemented with MUG must be used. The inner inverted fermentation tube may be omitted. The procedure for transferring a total coliform-positive culture to EC medium supplemented with MUG shall be as specified in subsection (B)(2) of this section for transferring a total coliform-positive culture to EC medium. Observe fluorescence with an ultraviolet light (366 nm) in the dark after incubating tube at 44.5 ± 0.2°C for 24 ± 2 hours; or

2. Nutrient agar supplemented with 100 μg/ml 4-methylumbelliferyl-beta-D-glucuronide (MUG) (final concentration). Nutrient Agar is described in Method 9221B (paragraph 3) in *Standard Methods for the Examination of Water and Wastewater,* 18th edition, 1992 and in the 19th edition, 1995; either edition may be used. This test is used to determine if a total coliform-positive sample, as determined by the Membrane Filter technique or any other method in which a membrane filter is used, contains *E. coli*. Transfer the membrane filter containing a total coliform colony(ies) to nutrient agar supplemented with 100μg/ml (final concentration) of MUG. After incubating the agar plate at 35°C for 4 hours, observe the colony(ies) under ultraviolet light (366 nm) in the dark for fluorescence. If fluorescence is visible, *E. coli* are present.

3. Minimal Medium ONPG-MUG (MMO-MUG) Test, as set forth in the article "National Field Evaluation of a Defined Substrate Method for the Simultaneous Detection of Total Coliforms and *Escherichia coli* from Drinking Water: Comparison with Presence-Absence Techniques" (Edberg et al.), Applied and Environmental Microbiology, Volume 55, pp. 1003-1008, April 1989. (Note: The Autoanalysis Colilert System is an MMO-MUG test). If the MMO-MUG test is total coliform-positive after a 24-hour incubation, test the medium for fluorescence with a 366 nm ultraviolet light (preferably with a 6 watt lamp) in the dark. If fluorescence is observed, the sample is *E. coli*-positive. If fluorescence is questionable (cannot be definitively read) after 24 hours incubation, incubate the culture for an additional four hours (but not to exceed 28 hours total), and again test the medium for fluorescence. The MMO-MUG Test with hepes buffer in lieu of phosphate buffer is the only approved formulation for the detection of *E. coli*.

4. The Colisure Test. A description of the Colisure Test may be obtained from the Millipore Coporation, Technical Services Department, 80 Ashby Road, Bedford MA, 01730.

5. The membrane filter method with MI agar.

6. E*Colite® Test, a description of which is cited in footnote 10 to Table 400-A-1 in subsection (A)(3) of this section.

7. m-ColiBlue24® Test, a description of which is cited in footnote 11 to Table 400-A-1 in subsection (A)(3) of this section.

D. As an option to subsection(C)(iii) of this section, a system with a total coliform-positive, MUG-negative, MMO-MUG test may further analyze the culture for the presence of *E. coli* by transferring a 0.1 ml, 28-hour MMO-MUG culture to EC Medium + MUG with a pipet. The formulation and incubation conditions of EC Medium + MUG, and observation of the results are described in subsection (C)(1) of this section.

E. The following materials are incorporated by reference in this section with the approval of the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Copies of the analytical methods cited in *Standard Methods for the Examination of Water and Wastewater* (18th and 19th editions) may be obtained from the American Public Health Association *et al*,; 1015 Fifteenth Street, NW.; Washington, DC 20005. Copies of the methods set forth in *Microbiological Methods for Monitoring the Environment, Water and Wastes* may be obtained from ORD Publications, U.S. EPA, 26 W. Martin Luther King Drive, Cincinnati, Ohio 45268. Copies of the MMO-MUG Test as set forth in the article "National Field Evaluation of a Defined Substrate Method for the Simultaneous Enumeration of Total Coliforms and *Escherichia coli* from Drinking Water: Comparison with the Standard Multiple Tube Fermentation Method" (Edberg *et al.*) may be obtained from the American Water Works Association Research Foundation, 6666 West Quincy Avenue, Denver, CO 80235. A description of the Colisure Test may be obtained from the Millipore Corp., Technical Services Department, 80 Ashby Road, Bedford, MA 01730. Copies may be inspected at EPA's Drinking Water Docket; 401 M Street, SW.; Washington, DC 20460, or at the Office of the Federal Register; 800 North Capitol Street, NW.; Suite 700; Washington, DC 20408.

403-A INORGANIC CHEMICAL SAMPLING AND ANALYTICAL REQUIREMENTS

TABLE 400-A-2 DETECTION LIMITS FOR INORGANIC CHEMICALS

CONTAMINANT	MCL (mg/l)	METHODOLOGY	DETECTION LIMIT (mg/l)
ANTIMONY	0.006	Atomic Absorption: Furnace Atomic Absorption: Platform	0.003 0.0008[5]

		ICP-Mass Spectrometry Hydride-Atomic Absorption	0.0004 0.001
ARSENIC	[6] 0.010	Atomic Absorption; Furnace Atomic Absorption; Platform--Stabilized Temperature. Atomic Absorption; Gaseous Hydride ICP-Mass Spectrometry	0.001 [7] 0.0005 0.001 [8] 0.0014
ASBESTOS	7 MFL[1]	Transmission Electron Microscopy	0.01 MFL
BARIUM	2	Atomic Absorption: furnace technique Atomic Absorption: direct aspiration Inductively Coupled Plasma	0.002 0.1 0.002 (0.001)
BERYLLIUM	0.004	Atomic Absorption: Furnace Atomic Absorption: Platform Inductively Coupled Plasma[2] ICP-Mass Spectrometry.	0.0002 0.00002[5] 0.0003 0.0003
CADMIUM	0.005	Atomic Absorption: furnace technique Inductively Coupled Plasma	0.0001 0.001
CHROMIUM	0.1	Atomic Absorption: furnace technique Inductively Coupled Plasma	0.001 0.007 (0.001)
CYANIDE	0.2	Distillation, Spectrophotometric[3] Distillation: Automated, Spectrophotometric[3] Distillation, Selective Electrode[3] Distillation, Amenable, Spectrophotometric[4]	0.02 0.005 0.05 0.02
MERCURY	0.002	Manual Cold Vapor Technique Automated Cold Vapor Technique	0.0002 0.0002
NICKEL	x1	Atomic Absorption: Furnace Atomic Absorption: Platform Inductively Coupled Plasma[2] ICP-Mass Spectrometry	0.001 0.0006[5] 0.005 0.0005
NITRATE	10 (as N)	Manual Cadmium Reduction Automated Hydrazine Reduction Automated Cadmium Reduction Ion Selective Electrode Ion Chromatography	0.01 0.01 0.05 1 0.01
NITRITE	1 (as N)	Spectrophotometric Automated Cadmium Reduction Manual Cadmium Reduction Ion Chromatography	0.01 0.05 0.01 0.004
SELENIUM	0.05	Atomic Absorption: furnace Atomic Absorption: gaseous hydride	0.002 0.002

THALLIUM	0.002	Atomic Absorption: Furnace Atomic Absorption: Platform ICP-Mass Spectrometry.	0.001 0.0007[5] 0.0003

[1] MFL = million fibers per liter > 10 micrometers
[2] Using a 2X preconcentration step as noted in Method 200.7. Lower MDLs may be achieved when using a 4X preconcentration.
[3] Screening method for total cyanides.
[4] Measures "free" cyanides.
[5] Lower MDLs are reported using stabilized temperature graphite furnace atomic absorption.
[6] The value for arsenic is effective January 23, 2006. Until then, the MCL is 0.05 mg/L.
[7] The MDL reported for EPA Method 200.9 (Atomic Absorption; Platform - Stabilized Temperature) was determined using a 2x concentration step during sample digestion. The MDL determined for samples analyzed using direct analyses (i.e. no sample digestion) will be higher. Using multiple depositions, EPA 200.9 is capable of obtaining MDL of 0.0001 mg/L.
[8] Using selective ion monitoring, EPA method 200.8 (ICP-MS) is capable of obtaining a MDL of 0.0001 mg/L.

A. Inorganic Analysis:

1. Analysis for the following contaminants shall be conducted in accordance with the methods in the Table 400-A-3, or their equivalent as determined by EPA. Criteria for analyzing arsenic, barium, beryllium, cadmium, calcium, chromium, copper, lead, selenium, sodium, and thallium with digestion or directly without digestion, and other analytical test procedures are contained in *Technical Notes on Drinking Water Methods*, EPA-600/R-94-173, October 1994. This document also contains approved analytical test methods which remain available for compliance monitoring until July, 1996. These methods will not be available for use after July 1, 1996. This document is available from the National Technical Information Service, NTIS PB95-104766, U.S. Department of Commerce, 5285 Port Royal Road, Springfield, Virginia 22161 (1-800-553-6847).

TABLE 400-A-3 INORGANIC CONTAMINANTS ANALYTICAL METHODS

CONTAMINANT	METHODOLOGY	EPA	ASTM[3]	SM[4]	SM online[22]	OTHER
Antimony	Atomic Absorption; Furnace			3113 B		
	Atomic Absorption; Platform	[2]200.9				
	ICP-Mass Spectrometry	[2]200.8				
	Hydride-Atomic Absorption		D-3697-92			
Arsenic	Inductively Coupled Plasma	[2]200.7		[15]3120 B		
	ICP-Mass Spectrometry	[2]200.8				
	Atomic Absorption; Platform	[2]200.9				
	Atomic Absorption; Furnace		D-2972-97,03 C	3113 B	3113B-99	
	Hydride Atomic Absorption		D-2972-97,03 B	3114 B	3114B-97	
Asbestos	Transmission Electron Microscopy	[9]100.1				
	Transmission Electron Microscopy	[10]100.2				
Barium	Inductively coupled plasma	[2]200.7		3120 B		
	ICP Mass Spectrometry	[2]200.8				
	Atomic Absorption; Direct			3111 D		
	Atomic Absorption; Furnace			3113 B		
Beryllium	Atomic Absorption; furnace		D-3645-93B	3113 B		
	Atomic Absorption; platform	[2]200.9				
	Inductively Coupled Plasma	[2]200.7		3120 B		
	ICP-Mass Spectrometry	[2]200.8				
Cadmium	Inductively Coupled plasma	[2]200.7				
	ICP Mass Spectrometry	[2]200.8				
	Atomic Absorption; Platform	[2]200.9				
	Atomic Absorption; Furnace			3113 B		
Chromium	Inductively Coupled Plasma	[2]200.7		3120 B		
	ICP-Mass Spectrometry	[2]200.8				
	Atomic Absorption; Platform	[2]200.9				
	Atomic absorption; Furnace			3113 B		
Cyanide	Manual Distillation followed by		D2036-98A	4500-CN-C		

	Spectrophotometric, Amenable		D-2036-98B	4500-CN-G		
	Spectrophotometric Manual		D-2036-98A	4500-CN-E		I-3300 -85[5]
	Spectrophotometric Semi-Automated	[6]335.4				
	Selective Electrode			4500-CN-F		
Fluoride	Ion Chromatography	[6]300.0	D4327-91	4110B		
	Manual Distill; color. SPADNS			4500F-B,D		
	Manual Electrode		D1179-93B	4500F-C		
	Automated Electrode					380-75 WE [11]
	Automated Alizarin			4500F-E		129-71 W [11]
	Capillary Ion Electrophoresis					D6508, Rev.2[23]
Mercury	Manual cold vapor	[2]245.1	D3223-97,02	3112 B		
	Automated cold vapor	[1]245.2				
	ICP-Mass Spectrometry	[2]200.8				
Nickel	Inductively Coupled Plasma	[2]200.7		3120B		
	ICP-Mass Spectrometry	[2]200.8				
	Atomic Absorption; Platform	[2]200.9				
	Atomic Absorption; Direct			3111B		
	Atomic Absorption; Furnace			3113B		
Nitrate	Ion chromatography	[6]300.0	D4327-97, 03	4110B		B-1011 [8]
	Automated cadmium reduction	[6]353.2	D3867-90A	4500-NO_3-F		
	Ion selective electrode			4500-NO_3-D		601[7]
	Manual cadmium reduction		D3867-90B	4500-NO_3-E		
	Capillary Ion Electrophoresis					D6508, Rev.2[23]
Nitrite	Ion chromatography	[6]300.0	D4327-97, 03	4110B		B-1011[8]
	Automated cadmium reduction	[6]353.2	D3867-90A	4500-NO_3-F		
	Manual cadmium reduction		D3867-90B	4500-NO_3-E		
	Spectrophotometric			4500-NO_2-B		
	Capillary Ion Electrophoresis					D6508, Rev.2[23]
Selenium	Hydride-Atomic Absorption		D3859-93A	3114B		
	ICP Mass Spectrometry	[2]200.8				
	Atomic Absorption; Platform	[2]200.9				
	Atomic absorption; Furnace		D3859-98B, 03	3113B		
Thallium	Atomic Absorption; Platform	[2]200.9				
	ICP-Mass Spectrometry	[2]200.8				
Lead	Atomic Absorption; furnace		D3559-95D	3113B		
	ICP Mass Spectrometry	[2]200.8				
	Atomic Absorption; platform	[2]200.9				
	Differential Pulse Anodic Stripping Voltametry					Method 1001[15]
Copper	Atomic absorption; furnace		D1688-95C	3113B		
	Atomic absorption; direct aspiration		D1688-95A	3111B		
	ICP	[2]200.7		3120B		
	ICP-Mass Spectrometry	[2]200.8				
	Atomic absorption; platform	[2]200.9				
Conducti-vity	Conductance		D1125-95A	2510B		
Alkalinity	Tritrimetric		D1067-92B	2320B		
	Electrometric titration					I-1030 -85 [5]
Calcium	EDTA titrimetric		D511-93 A	3500-Ca-D		
	Atomic Absorption; direct aspiration		D511-93 B	3111B		
	Inductively-coupled plasma	[2]200.7		3120B		
	Ion Chromatography		D6919-03			
Magnesium	Atomic Absorption		D 511-93, 03B	3111 B		
	ICP	[2]200.7		3120 B		
	Complexation Titrimetric Methods		D 511-93, 03A	3500-Mg E		
	Ion Chromatography		D6919-03			
Orthophos-phate [12]	Colorimetric, automated, ascorbic acid	[6]365.1		4500-P F		
	Colorimetric, ascorbic acid, single reagent		D515-88A	4500-P E		
	Colorimetric, phosphomolybdate					I-1602

						-85[5]
	automated-segmented flow;					I-2601 -90[5]
	automated discrete					I-2598 -85[5]
	Ion chromatography	[6]300.0	D4327-97, 03	4110 B		
	Capillary Ion Electrophoresis					D6508, Rev.2[23]
pH	Electrometric	[1]150.1 [1]150.2	D1293-95	4500-H+-B		
Silica	Colorimetric, molybdate blue;					I-1700 -85[5]
	automated-segmented flow					I-2700 -85[5]
	Colorimetric		D859-94, 00			
	Molybdosilicate			4500-Si-D		
	Heteropoly blue			4500-Si-E		
	Automated method for molybdate-reactive silica			4500-Si-F		
	Inductively-couple plasma	[3]200.7		3120B		
Sodium	Inductively-coupled plasma	[2]200.7				
	Atomic Absorption; direct aspiration			3111B		
	Ion chromatography		D6919-03			
Tempera-ture	Thermometric			2500B		

The procedures shall be done in accordance with the documents listed below. Copies of the documents may be obtained from the sources listed below. Information regarding obtaining these documents can be obtained from the Safe Drinking Water Hotline 800-426-4791. Documents may be inspected at EPA's Drinking Water Docket, EPA West, 1301 Constitution Avenue, NW, Room B135, Washington, D.C. (Telephone: 202-566-2426); or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, Call 202-741-6030, or go to: http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html.

[1] "Method for Chemical Analysis of Water and Wastes" , EPA-600/4-79-020, March 1983. Available at NTIS, PB84-128677.

[2] "Methods for the Determination of Metals in Environmental Samples-Supplement I", EPA-600/R-94-111, May 1994. Available at NTIS, PB 95-125472.

[3] Annual Book of ASTM Standards, 1994, 1996, 1999 or 2003, Vols. 11.01 and 11.02, ASTM International; any year containing the cited version of the method may be used. The previous versions of D1688-95A, D1688-95C (copper), D3559-95D (lead), D1293-95 (pH), D1125-91A (conductivity) and D859-94 (silica) are also approved. These previous versions D1688-90A, C; D3559-90D, D1293-84, D1125-91A and D859-88, respectively are located in the Annual Book of ASTM Standards, 1994, Vol. 11.01. Copies may be obtained from the ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428.

[4] Standard Methods for the Examination of Water and Wastewater, 18th edition (1992), 19th edition (1995), or 20th edition (1998). American Public Health Association 1015 Fifteenth Street NW, Washington, DC 20005. The cited methods published in any of these three editions may be used, except that the versions of 3111B, 3111D, 3113B and 3114B in the 20th edition may not be used.

[5] Method I-2601-90, Methods for Analysis by the U.S. Geological Survey National Water Quality Laboratory - Determination of Inorganic and Organic Constituents in Water and Fluvial Sediments, Open File Report 93-125, 1993; For Methods I-1030-85; I-1601-85: I-1700-85; I-2598-85; I-2700-85; and I-3300-85 see Techniques of Water Resources Investigation of the U.S. Geological Survey, Book 5 Chapter A-1, 3rd ed., 1989; Available from Information Services, U.S. Geological Survey, Federal Center, Box 25286, Denver,CO 80225-0425.

[6] "Methods for the Determination of Inorganic Substances in Environmental Samples", EPA 600/R-93-100, August 1993, Available at NTIS, PB94-120821.

[7] The procedure shall be done in accordance with the Technical Bulletin 601 "Standard Method of Test for Nitrate in Drinking Water", July, 1994, PN 221890-001, Analytical Technology, Inc. Copies may be obtained from ATI Orion, 529 Main Street, Boston, MA 02129.

[8] Method B-1011, "Waters Test Method for Determination of Nitrite/Nitrate in Water Using Single Column Ion Chromatography " August 1987. Copies may be obtained from Waters Corporation, Technical Services Division, 34 Maple Street, Milford, MA 01757, Telephone 508/482-2131, Fax 508/482-3625.

[9] Method 100.1 "Analytical Method for Determination of Asbestos Fibers in Water", EPA-600/4-83/043, September 1983, Available at NTIS, PB83-260471.

[10] Method 100.2, "Determination of Asbestos Structure Over 10-μm in Length in Drinking Water", EPA-600/R-94-134, June 1994, Available at NTIS, PB94-201902.

[11] Industrial Method No. 129-71W, "Fluoride in Water and Wastewater", December 1972 and Method No. 380-75WE, "Fluoride in Water and Wastewater", February 1976, Technicon Industrial Systems. Copies may be obtained from Bran & Leubbe, 1025 Busch Parkway, Buffalo Grove, IL 60089.

[12] Unfiltered, no digestion or hydrolysis.

[13] Because MDLs reported in EPA Methods 200.7 and 200.9 were determined using a 2X preconcentration step during sample digestion, MDLs determined when samples are analyzed by direct analysis (i.e., no sample digestion) will be higher. For direct analysis of cadmium ~~and arsenic~~ by Method 200.7, ~~and arsenic by Method 3120 B~~ sample preconcentration using pneumatic nebulization may be required to achieve lower detection limits. Preconcentration may also be required for direct analysis of antimony, lead, and thallium by Method 200.9; antimony and lead by Method 3113 B; and lead by Method D3559-90D unless multiple in-furnace depositions are made.

[14] If ultrasonic nebulization is used in the determination of arsenic by Method~~s 200.7,~~ 200.8, or SM 3120 B, the arsenic must be in the pentavalent state to provide uniform signal response. ~~For methods 200.7 and 3120 B, both samples and standards must be diluted in the same mixed acid matrix concentration of nitric and hydrochloric acid with the addition of 100 µL of 30% hydrogen peroxide per 100ml of solution.~~ For direct analysis of arsenic with method 200.8 using ultrasonic nebulization, samples and standards must contain one mg/L of sodium hypochlorite.

[15] ~~Starting January 23, 2006, analytical methods using the ICP-AES technology, may not be used because the detection limits for these methods are 0.008 mg/L or higher. This restriction means that the two ICP-AES methods (EPA Method 200.7 and SM3120 B) approved for use for the MCL of 0.05 mg/L may not be used for compliance determinations for the revised MCL of 0.010 mg/L. However, prior to January 23, 2006, systems may have compliance samples analyzed with these less sensitive methods.~~ Reserved.

[16] The description for Method Number 1001 for lead is available from Palintest, LTD, 21 Kenton Lands Road, P.O. Box 18395, Erlanger, KY 41018 or from the Hach Company, P.O. Box 389, Loveland, CO 80539.

[17] the description for the Kelada 01 Method, "Kelada Automated Test Methods for Total Cyanide, Acid Dissociable Cyanide, and Thiocyanate", Revision 1.2, August 2001, EPA #821-B-01-009 for cyanide is available from the National Technical Information Service (NTIS), PB 2001-108275, 5282 Port Royal Road, Springfield, VA 22161. The toll free telephone number is 800-553-6847. **Note:** A 450-W UB lamp may be used in this method instead of the 550-W lamp specified if it provides performance within the quality control (QC) acceptance criteria of the method in a given instrument. Similarly, modified flow cell configurations and flow conditions may be used in the method, provided that the QC acceptance criteria are met.

[18] The description for the QuikChem Method 10-204-001-X, "Digestion and distillation of total cyanide in drinking and wastewaters using MICRO DIST and determination of cyanide by flow injection analysis," Revision 2.1, November 30, 2000 for cyanide is available from Lachat Instruments, 6645 W. Mill Rd, Milwaukee, WI 53218, USA. Phone 414-358-4200.

[19] "Methods for the Determination of Organic and Inorganic Compounds in Drinking Water," Vol. 1, EPA 815-R-00-014, August 2000. Available at NTIS, PB2000-106981.

[20] Method OIA-1677, DW "Available Cyanide by Flow Injection, Ligand Exchange, and Amperometry," January 2004. EPA-821-R-04-001, Available from ALPKEM, A Division of OI Analytical, P.O. Box 9010, College Station, TX 77842-9010.

[21] Sulfide levels below those detected using lead acetate paper may produce positive method interferences. Test samples using a more sensitive sulfide method to determine if a sulfide interference is present, and treat samples accordingly.

[22] Standards Methods Online are available at http://www.standardmethods.org. The year in which each method was approved by the Standard Methods Committee is designated by the last two digits in the method number. The methods listed are the only online versions that may be used.

[23] Method D6508, Rev. 2, "Test Method for Determination of Dissolved Inorganic Anions in Aqueous Matrices Using Capillary ion Electrophoresis and Chromate Electrolyte," Available from Waters Corp, 34 Maple St. Milford, MA, 07157, Telephone: 508/482-2131, Fax: 508/482-3625.

B. Sample collection for antimony, arsenic, asbestos, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, nickel, nitrate, nitrite, selenium and thallium under this section shall be conducted using the sample preservation, container, and maximum holding time procedures specified in the table below:

TABLE 400-A-4 SAMPLE COLLECTION PROCEDURE

CONTAMINANT	PRESERVATIVE[1]	CONTAINER[2]	TIME[3]
Antimony	HNO_3	P or G	6 months
Arsenic	Conc HNO_3 to pH < 2	P or G	6 months
Asbestos	4°C	P or G	48 hours[4]
Barium	HNO_3	P or G	6 months

Beryllium	HNO_3	P or G	6 months
Cadmium	HNO_3	P or G	6 months
Chromium	HNO_3	P or G	6 months
Cyanide	4°C, NaOH	P or G	14 days
Fluoride	NONE	P or G	1 month
Mercury	HNO_3	P or G	28 days
Nickel	HNO_3	P or G	6 months
Nitrate	4°C	P or G	48 hours[5]
Nitrate-Nitrite[6]	H_2SO_4	P or G	28 days
Nitrite	4°C	P or G	48 hours
Selenium	HNO_3	P or G	6 months
Thallium	HNO_3	P or G	6 months

[1] For cyanide determinations samples must be adjusted with sodium hydroxide to pH 12 at the time off collection. When chilling is indicated the sample must be shipped and stored at 4 deg. C or less. Acidification of nitrate or metals samples may be with a concentrated acid or a dilute (50% by volume) solution of the applicable concentrated acid. Acidification of samples for metals analysis is encouraged and allowed at the laboratory rather than at the time of sampling provided the shipping time and other instructions in Section 8.3 of EPA Methods 200.7 or 200.8 or 200.9 are followed.
[2] P = plastic, hard or soft; G=glass, hard or soft.
[3] In all cases, samples should be analyzed as soon after collection as possible. Follow additional (if any) information on preservation, containers, or holding times that is specified in method.
[4] Instruction for containers, preservation procedures and holding times as specified in Method 100.2 must be adhered to for all compliance analyses including those conducted with Method 100.1.
[5] If the sample is chlorinated, the holding time for an un-acidified sample kept at 4°C is extended to 14 days.
[6] Nitrate-Nitrite refers to a measurement of total nitrate.

C. Analysis under this section shall only be conducted by laboratories that have been certified by EPA. Laboratories may conduct sample analysis under provisional certification until January 1, 1996. To receive certification to conduct analyses for antimony, arsenic, asbestos, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, nickel, nitrate, nitrite, selenium and thallium, the laboratory must:

1. Analyze Performance Evaluation (PE) provided by EPA, at least once a year.
2. For each contaminant that has been included in the PE sample and for each method for which the laboratory desires certification achieve quantitative results on the analyses that are within the following acceptance limits:

TABLE 400-A-5 CONTAMINANT ACCEPTANCE LIMIT

CONTAMINANT	**ACCEPTANCE LIMIT**
Antimony	± 30 at ≥ 0.006 mg/l
Arsenic	± 30 at ≥ 0.003 mg/L
Asbestos	2 standard deviations based on study statistics
Barium	± 15% at ≥ 0.15 mg/l
Beryllium	± 15% at ≥ 0.001 mg/l
Cadmium	± 20% at ≥ 0.002 mg/l

Chromium	± 15% at ≥ 0.01 mg/l
Cyanide	± 25% at ≥ 0.1 mg/l
Fluoride	± 10% at ≥1 to 10 mg/l
Mercury	± 30% at ≥ 0.0005 mg/l
Nitrate	± 10% at ≥ 0.4 mg/l
Nitrite	± 15% at ≥ 0.4 mg/l
Selenium	± 20% at ≥ 0.01 mg/l
Thallium	± 30% at ≥ 0.002 mg/l

404-A ORGANIC CHEMICALS SAMPLING AND ANALYTICAL REQUIREMENTS

A. Analyses for the contaminants listed in § 204, Table 200.3 (1) through (21), shall be conducted using the following EPA methods or their equivalent as approved by EPA or the alternative methods listed in Appendix A to Subpart C of 40 C.F.R. pt. 141, or their equivalent as determined by EPA.

1. The following documents are incorporated by reference. Copies may be inspected at EPA's Drinking Water Docket, 401 M Street, SW., Washington, DC 20460; at the Office of the Federal Register, 800 North Capitol Street, NW., Suite 700, Washington, DC. Method 508A and 515.1 are in *Methods for the Determination of Organic Compounds in Drinking Water*, EPA-600/R-88-039, December 1988, revised July 1991. Methods 547, 550 and 550.1 are in *Methods for the Determination of Organic Compounds in Drinking Water-Supplement I*, EPA-600-4-90-020, July 1990. Methods 548.1, 549.1, 552.1 and 555 are in Methods for the Determination of Organic Compounds in Drinking Water-Supplement II, EPA-600/R-92-129, August 1992. Methods 502.2, 504.1, 505, 506, 507, 508, 508.1, 515.2, 524.2, 525.2, 531.1, 551.1, and 552.2 are in *Methods for the Determination of Organic Compounds in Drinking Water-Supplement III*, EPA/600/R-95-131, August 1995. Method 1613 is titled "Tetra-through Octa-Chlorinated Dioxins and Furans by Isotope-Dilution HRGC/HRMS", EPA -821-B-94-005, October 1994. These documents are available from the NTIS PB91-231480, PB91-146027, PB92-207703, PB95-261616 and PB95-104774, US Department of Commerce, 5285 Port Royal Road, Springfield, VA 22161 (1-800-553-6847). Method 6651 shall be followed in accordance with *Standard Methods for the Examination of Water and Wastewater*, 18th edition, 1992 and 19th edition, 1995, American Public Health Association (APHA); either edition may be used. Method 6610 shall be followed in accordance with the *Supplement to the 18th edition of Standard Methods for the Examination of Water and Wastewater,* 1994, or with the19th edition of *Standard Methods for the Examination of Water and Wastewater,* 1995, APHA; either publication may be used. The APHA documents are available from APHA 1015, Fifteenth Street NW., Washington, D.C. 20005. Other required analytical test procedures germane to the conduct of these analyses are contained in *Technical Notes on Drinking Water Methods,* EPA 600/R-94-173, October 1994, NTIS PB95-104766. EPA Methods 515.3 and 549.2 are available from U.S. Environmental Protection Agency, National Exposure Research Laboratory (NERL)-Cincinnati, 26 West Martin Luther King Drive, Cincinnati, OH 45268. ASTM Method D 5317-93 is available in the *Annual Book of ASTM Standards*, 1996, Vol. 11.02, American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428, or in any edition published after 1993.

TABLE: 400-A-6 ORGANIC CHEMICALS OTHER THAN TOTAL TRIHALOMETHANES SAMPLING AND ANALYTICAL METHODS

Contaminant	Method	Standard Methods	ASTM	Other
Benzene	502.2, 524.2			
Carbon Tetrachloride	502.2, 524.2, 551.1			
Chlorobenzene	502.2, 524.2			

1,2-Dichlorobenzene	502.2, 524.2			
1,4-Dichlorobenzene	502.2, 524.2			
1,2-Dichloroethane	502.2, 524.2			
cis-Dichloroethylene	502.2, 524.2			
trans-Dichloroethylene	502.2, 524.2			
1,2-Dichloropropane	502.2, 524.2			
Ethylbenzene	502.2, 524.2			
Styrene	502.2, 524.2			
Tetrachloroethylene	502.2, 524.2, 551.1			
1,1,1-Trichloroethane	502.2, 524.2, 551.1			
Trichloroethylene	502.2, 524.2, 551.1			
Toluene	502.2, 524.2			
1,2,4-Trichlorobenzene	502.2, 524.2			
1,1-Dichloroethylene	502.2, 524.2			
1,1,2-Trichloroethane	502.2, 524.2, 551.1			
Vinyl Chloride	502.2, 524.2			
Xylenes (total)	502.2, 524.2			
2,3,7,8-TCDD (dioxin)	1613			
2,4-D[4] (as acids, salts, and esters)	515.2, 555, 515.1, 515.3, 515.4		D5317-93, 98 (Reapproved 2003).	
2,4,5-TP[4] (Silvex)	515.2, 555, 515.1, 515.3, 515.4		D5317-93, 98 (Reapproved 2003).	
Alachlor[2]	507, 525.2, 508.1, 505, 551.1			
Atrazine[2]	507, 525.2, 508.1, 505, 551.1			Syngenta [5] AG-625
Benzo(a)pyrene	525.2, 550, 550.1			
Carbofuran	531.1, 531.2	6610		
Chlordane	508, 525.2, 508.1, 505			
Dalapon	552.1, 515.1, 552.2, 515.3, 515.4, 552.3			
Di(2-ethylhexyl)adipate	506, 525.2			
Di(2-ethylhexyl)phthalate	506, 525.2			
Dibromochloropropane	504.1, 551.1			

(DBCP)				
Dinoseb[4]	515.2, 555, 515.1, 515.3, 515.4			
Diquat	549.2			
Endothall	548.1			
Endrin	505, 508, 525.2, 508.1, 551.1			
Ethylene dibromide (EDB)	504.1, 551.1			
Glyphosate	547	6651		
Heptachlor	505, 508, 525.2, 508.1, 551.1			
Heptachlor epoxide	505, 508, 525.2, 508.1, 551.1			
Hexachlorobenzene	505, 508, 525.2, 508.1, 551.1			
Hexachlorocylopentadiene	505, 508, 525.2, 508.1, 551.1			
Lindane	505, 508, 525.2, 508.1, 551.1			
Methoxychlor	505, 508, 525.2, 508.1, 551.1			
Oxamyl	531.1, 531.2	6610		
PCBs[3] (as decachlorobiphenyl) ~~(as Aroclors)~~	508A ~~505, 508, 508.1, 525.2~~			
PCBs[3] ~~(as decachlorobiphenyl)~~ (as Aroclors)	508A 505, 508, 508.1, 525.2			
Pentachlorophenol	515.2, 525.2, 555, 515.1, 515.3, 515.4		D5317-93, 98 (Reapproved 2003).	
Picloram[4]	515.2, 555, 515.1, 515.3, 515.4		D5317-93, 98 (Reapproved 2003).	
Simazine[2]	507, 525.2, 508.1, 505, 551.1			
Toxaphene	508, 508.1, 525.2, 505			
Total Trihalomethanes	502.2, 524.2, 551.1			

[1] ~~For previously approved EPA methods which remain available from compliance monitoring until June 1, 2001, see paragraph (c)(2) of this section.~~ **Reserved.**

[2] Substitution of the detector specified in Method 505, 507, 508, or 508.1 for the purpose of achieving lower detection limits is allowed as follows. Either an electron capture or nitrogen phosphorous detector may be used provided all regulatory requirements and quality control criteria are met.

[3] PCBs are qualitatively identified as Aroclors and measured for compliance purposes as

decachlorobiphenyl. Users of Method 505 may have more difficulty in achieving the required detection limits than users of Methods 508.1, 525.2 or 508.

[4] Accurate determination of the chlorinated esters requires hydrolysis of the sample as described in EPA methods 515.1, 515.2, 515.3, and 555, and ASTM Method D 5317-93.

[5] This method may not be used for the analyses of atrazine in any system where chlorine dioxide is used for drinking water treatment. In samples from all other systems, any result for atrazine generated by Method AG-625 that is greater than one-half the maximum contaminant level (MCL) (in other words, greater than 0.0015 mg/L or 1.5 µg/L) must be confirmed using another approved method for this contaminant and should use additional volume of the original sample collected for compliance monitoring. In instances where a result from Method AG-625 triggers such confirmatory testing, the confirmatory result is to be used to determine compliance.

B. Compositing samples prior to GC analysis.

1. Add 5 ml or equal larger amounts of each sample (up to 5 samples are allowed) to a 25 ml glass syringe. Special precautions must be made to maintain zero head-space in the syringe.

2. The samples must be cooled at 4° Celsius during this step to minimize volatilization losses.

3. Mix well and draw out a 5-ml aliquot for analysis.

4. Follow sample introduction, purging, and desorption steps described in the method.

5. If less than five samples are used for compositing, proportionately small syringe may be used.

C. Compositing samples prior to GC/MS analysis.

1. Inject 5-ml or equal larger amounts of each aqueous sample (up to 5 samples are allowed) into a 25-ml purging device using the sample introduction technique described in the method.

2. The total volume of the sample in the purging device must be 25 ml.

3. Purge and desorb as described in the method.

D. Analysis under this section shall only be conducted by laboratories that are certified by EPA according to the following conditions (laboratories may conduct sample analysis under provisional certification until January 1, 1996):

1. To receive certification to conduct analyses for the contaminants in § 204 (A)(1) Table 200.3 (2) through (21) the laboratory must:

a. Analyze Performance Evaluation (PE) samples provided by EPA at least once a year by each method for which the laboratory desires certification.

b. Achieve the quantitative acceptance limits under subsection (E)(1)(c) and (d) of this section for at least 80% of the regulated organic chemicals listed in Table 200.3 (2) through (21).

c. Achieve quantitative results on the analyses performed under subsection (E)(1)(a) of this section that are within ±20% of the actual amount of the substances in the Performance Evaluation sample when the actual amount is greater than or equal to 0.010 mg/l.

d. Achieve quantitative results on the analyses performed under subsection (E)(1)(a) of this section that are within ±40% of the actual amount of the substances in the Performance Evaluation sample when the actual amount is less than 0.010 mg/l.

e. Achieve a method detection limit of 0.0005 mg/l, according to the procedures in Appendix B of 40 CFR Part 136.

2. To receive certification for vinyl chloride, the laboratory must:

a. Analyze Performance Evaluation (PE) samples provided by EPA at least once a year

by each method for which the laboratory desires certification.

b. Achieve quantitative results on the analyses performed under subsection(E)(2)(a) of this section that are within ±40% of the actual amount of vinyl chloride in the Performance Evaluation sample.

c. Achieve a method detection limit of 0.0005 mg/l, according to the procedures in Appendix B of 40 CFR Part 136.

d. Obtain certification for the contaminants listed in Table 200.3 (2) through (21).

3. Each certified laboratory must determine the method detection limit (MDL), as defined in Appendix B to 40 CFR Part 136, at which it is capable of detecting VOCs. The acceptable MDL is 0.0005 mg/l. This concentration is the detection concentration for purposes of this section.

4. Analysis for PCBs shall be conducted as follows using the methods in subsection A of this section:

a. Each system which samples for PCBs shall analyze each sample using either Method 508.1, 525.2, 508 or 505. Users of method 505 may have more difficulty in achieving the required Aroclor detection limits than users of Methods 508.1, 525.2, or 508.

b. If PCBs (as one of seven Arochlors) are detected (as designated in this subsection) in any sample analyzed using Methods 505 or 508, the system shall reanalyze the sample using Method 508A to quantitate PCBs (as decachlorobiphenyl).

TABLE 400-A-7 DETECTION LIMIT OF PCB

AROCHLOR	DETECTION LIMIT mg/l)
1016	0.00008
1221	0.02
1232	0.0005
1242	0.0003
1248	0.0001
1254	0.0001
1260	0.0002

c. Compliance with the PCB MCL shall be determined based upon the quantitative results of analyses using Method 508A.

5. Detection, as used in this subsection, shall be defined as greater than or equal to the following concentrations for each contaminant.

TABLE 400-A-8 DETECTION LIMIT

CONTAMINANT	LIMIT (mg/l)
Alachlor	0.0002
Aldicarb	0.0005
Aldicarb sulfoxide	0.0005
Aldicarb sulfone	0.0008
Atrazine	0.0001

Benzo(a)pyrene	0.00002
Carbofuran	0.0009
Chlordane	0.0002
Dalapon	0.001
Dibromochloropropane (DBCP)	0.00002
Di(2-ethylhexyl) adipate	0.0006
Di(2-ethylhexyl) phthalate	0.0006
Dinoseb	0.0002
Diquat	0.0004
2,4-D	0.0001
Endothall	0.009
Endrin	0.00001
Ethylene dibromide (EDB)	0.00001
Glyphosate	0.006
Heptachlor	0.00004
Heptachlor epoxide	0.00002
Hexachlorobenzene	0.0001
Hexachlorocyclopentadiene	0.0001
Lindane	0.00002
Methoxychlor	0.0001
Oxamyl	0.002
Picloram	0.0001
Polychlorinated biphenyls (PCBs) (as decachlorobiphenyl)	0.0001
Pentachlorophenol	0.00004
Simazine	0.00007
Toxaphene	0.001
2,3,7,8-TCDD(Dioxin)	0.000000005
2,4,5-TP (Silvex)	0.0002

6. Analysis under this section shall only be conducted by laboratories that have received certification by EPA and have met the following conditions:

   a. To receive certification to conduct analyses for the contaminants in § 204 (A)(2) the laboratory must:

      1. Analyze Performance Evaluation (PE) samples provided by EPA at least once a year by each method for which the laboratory desires certification.

      2. For each contaminant that has been included in the PE sample achieve

quantitative results on the analyses that are within the following acceptance limits:

TABLE 400-A-9 ACCEPTANCE LIMITS

CONTAMINANT	ACCEPTANCE LIMITS(%)
Dibromochloropropane (DBCP)	± 40
Ethyldibromide (EDB)	± 40
Alachlor	± 45
Atrazine	± 45
Benzo(a)pyrene	2 Standard deviations
Carbofuran	± 45
Chlordane	± 45
Dalapon	2 Standard deviations
Di(2-ethylhexyl)adipate	2 Standard deviations
Di(2-ethylhexyl)phthalate	2 Standard deviations
Dinoseb	2 Standard deviations
Diquat	2 Standard deviations
Endothall	2 Standard deviations
Endrin	± 30
Glyphosate	2 Standard deviations
Heptachlor	± 45
Heptachlor Epoxide	± 45
Hexachlorobenzene	2 Standard deviations
Hexachloro-cyclopentadiene	2 Standard deviations
Lindane	± 45
Methoxychlor	± 45
Oxamyl	2 Standard deviations
PCBs (as Decachlorobiphenyl)	0-200
Picloram	2 Standard deviations
Simazine	2 Standard deviations
Toxaphene	± 45
Aldicarb	2 Standard deviations
Aldicarb sulfoxide	2 Standard deviations
Aldicarb sulfone	2 Standard deviations
Pentachlorophenol	± 50

2,3,7,8-TCDD (Dioxin)	2 Standard deviations
2,4-D	± 50
2,4-TP (Silvex)	± 50

405-A ANALYTICAL METHODS FOR RADIOACTIVITY

A. Analysis for the following contaminants shall be conducted to determine compliance with §209 (radioactivity) in accordance with the methods in the following table, or the alternative methods listed in Appendix A to subpart C of 40 C.F.R. pt. 141, or their equivalent determined by EPA in accordance with § 415.

TABLE 400-A-10 RADIOACTIVITY METHODS

Contaminant	Methodology	Reference (method or page number)								
		EPA[1]	EPA[2]	EPA[3]	EPA[4]	SM[5]	ASTM[6]	USGS[7]	DOE[8]	Other
Naturally occurring: Gross alpha [11] and beta	Evaporation	900.0	p 1	00-01	p 1	302, 7110 B		R-1120-76		
Gross Alpha[11]	Co-precipitation			00-02		7110 C				
Radium 226	Radon emanation	903.1	p 16	Ra-04	p 19	305,7500-Ra C	D 3454-97	R-1141-76	Ra-04	N.Y.[9]
	Radio chemical	903.0	p 13	Ra-03		304 7500-Ra B	D 2460-97	R-1140-76		
Radium 228	Radio chemical	904.0	p 24	Ra-05	p 19	7500-Ra D		R-1142-76		N.Y.[9] N.J.[10]
Uranium [12]	Radio Chemical	908.0				7500-U B				
	Fluorometric	908.1				7500-U C(17th Ed)	D2907-97	R-1180-76 R-1181-76	U-04	
	ICP-MS	200.8[13]				3125	D5673-03			
	Alpha spectrometry			00-07	p 33	7500-U C (18th 19th or 20th Ed)	D3972-97	R-1182-76	U-02	
	Laser Phosphorimetry						D5174-97			
Man-made:										
Radioactive cesium	Radio chemical	901.0	p 4			7500-Cs B	D 2459-72	R-1111-76		
	gamma ray spectrometry	901.1			p 92	7120	D 3649-91	R-1110-76	4.5.2.3	
Radioactive iodine	Radio chemical	902.0	p 6 p.9			7500-I B 7500-I C 7500-I D	D 3649-91			

	Gamma ray spectrometry	901.1			p 92	7120	D 4785-93		4.5.2 .3	
Radioactive Strontium 89, 90	Radio chemical	905.0	p 29	Sr-0 4	p 65	303, 7500-Sr B		R-1160-7 6	Sr-01 Sr-02	
Tritium	Liquid scintillation	906.0	p 34	H-02	p 87	306, 7500-^{3}H B, 306, 7500-^{3}H B-00	D 4107-91	R-1171-7 6		
Gamma emitters	gamma ray	901.1			p 92	7120	D 3649-91	R-1110-7 6	Ga-01 -R	
	spectrometry	902.0				7500-Cs B, 7500-I B	D4785 93			
		901.0								

The procedures shall be done in accordance with the documents listed below. Copies of the documents may be obtained from the sources listed below. Information regarding obtaining these documents can be obtained from the Safe Drinking Water hotline at 800-426-4791. Documents may be inspected at EPA's Drinking Water Docket, EPA West, 1301 Constitution Avenue, NW, Room B135, Washington, D.C., 20460 (telephone: 202- 566-2426); or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202-741-6030, or go to: *http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html.*

[1] "Prescribed Procedure for Measurement of Radioactivity in Drinking Water", EPA 600/4-80-032, August 1980. Available at U.S. Department of Commerce, National Technical Information Service (NTIS), 5285 Port Royal Road, Springfield, VA 22161 (Telephone 800-553-6847), PB 80-224744, except Method 200.8, "Determination of Trace Elements in Waters and Wastes by Inductively Coupled Plasma-Mass Spectrometry," Revision 5.4, which is published in "Methods for the Determination of Metals in Environmental Samples-Supplement I," EPA 600-R-94-111, May 1994. Available at NTIS, PB95-125472.

[2] "Interim Radiochemical Methodology for Drinking Water", EPA 600/4-75-008 (revised), March 1976, Available at NTIS, ibid. PB 253258.

[3] "Radiochemistry Procedures Manual", EPA 520/8-84-006, December 1987, Available at NTIS ibid, PB 84-215581.

[4] "Radiochemical Analytical Procedures for Analysis of Environmental Samples", March 1979, Available at NTIS, ibid. EMSL LV 053917

[5] "Standard Methods for the Examination of Water and Wastewater", 13th, 17th, 18th, 19th Editions, or 20th edition, 1971, 1989, 1992, 1995, 1998. Available at American Public Health Association, 1015 Fifteenth Street, N.W., Washington, D.C., 20005. Methods 302, 303, 304, 305 and 306 are only in the 13th edition. Methods 711B, 7500-Ra B, 7500-Ra C, 7500-Ra D, 7500-U B, 7500-Cs B, 7500-I B, 7500-I C, 7500-I D, 7500-Sr B, 7500-3H B are in the 17th, 18th, 19th, and 20th editions. Methods 7110 C is in the 18th, 19th and 20th editions. Method 7500-U C Fluorometric Uranium is only in the 17th edition, and 7500-U C Alpha spectrometry is only in the 18th, 19th and 20th editions. Method 7120 is only in the 19th and 20th editions. Methods 302, 303, 304, 305 and 306 are only in the 13th edition. Method 3125 is only in the 20th edition.

[6] Annual Book of ASTM Standards, Vol. 11.01 and 11.02, 1999; ASTM International any year containing the cited version of the method may be used. Copies of these two volumes and the 2003 version of D 5673-03 may be obtained from ASTM International. 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA, 19428-2959.

[7] "Methods for Determination of Radioactive Substances in Water and Fluvial Sediments", Chapter A5 in Book 5 of *Techniques of Water-Resources Investigations of the United States Geological Survey*, 1977. Available at U.S. Geological Survey (USGS) Information Services, Box 25286, Federal Center, Denver CO 80225-0425.

[8] "EML Procedures Manual", 28th (1997) or 27th (1990) Editions, Volumes 1 and 2; either may be used. In the 27th Edition Method Ra-04 is listed as Ra-05 and Method Ga-01-R is listed as Sect. 4.5.2.3. Available at the Environmental Measurements Laboratory, U.S. Department of Energy (DOE), 376 Hudson Street, New York, NY 10014-3621.

[9] "Determination of Ra-226 and Ra-228 (Ra-02)", January 1980, revised June 1982. Available at Radiological Sciences Institute Center for Laboratories and Research, New York State Department of Health, Empire State Plaza, Albany, NY 12201.

[10] "Determination of Radium 228 in Drinking Water", August 1980. Available at State of New Jersey, Department of Environmental Protection, Division of Environmental Quality. Bureau of Radiation and Inorganic Analytical Services, 9 Ewing Street, Trenton, NJ 08625.

[11] Natural uranium and thorium-230 are approved as gross alpha calibration standards for gross alpha with co-precipitation and evaporation methods; americium-241 is approved with co-precipitation methods.

[12] If uranium (U) is determined by mass, a 0.67 pCi/μg of uranium conversion factor must be used. This

conversion factor is based on the 1:1 activity of U-234 to U-238 that is characteristic of naturally occurring uranium.

[13] "Determination of Trace Elements in Waters and Wastes by Inductively Coupled Plasma-Mass Spectrometry," Revision 5.4, which is published in "Methods for the Determination of Metals in Environmental Samples-Supplement I," EPA 600-R-94-111, May 1994. Available at NTIS, PB 95-125472.

B. When the identification and measurement of radionuclides other than those listed in subsection (A) of this section is required, the following references are to be used, except in cases where alternative methods have been approved in accordance with § 415.

1. *Procedures for Radiochemical Analysis of Nuclear Reactors Aqueous Solutions*, H.L. Krieger and S. Gold, EPA-R4-73-014, USEPA, Cincinnati, Ohio 45268, May 1973.

2. *HASL Procedures Manual*, Edited by John H. Harley. HASL 300, ERDA Health and Safety Laboratory, New York, NY, 1973.

C. For the purpose of sampling radioactivity concentrations in drinking water, the required sensitivity of the radioanalysis is defined in terms of a detection limit. The detection limit shall be that concentration which can be counted with a precision of ± 100% at the 95% confidence level (1.96 sigma, where sigma is the standard deviation of the net counting rate of the sample).

1. To determine compliance with § 211 (A), the detection limit shall not exceed 1 pCi/l. To determine compliance with § 211 (B), the detection limit shall not exceed 3 pCi/l.

2. To determine compliance with § 211, the detection limits shall not exceed the concentrations listed in Table 400.10.

TABLE 400-A-11 DETECTION LIMITS FOR MAN-MADE BETA PARTICLE AND PHOTON EMITTERS

RADIONUCLIDE	DETECTION LIMIT
Tritium	1,000 pCi/l
Strontium-89	10 pCi/l
Strontium-90	2 pCi/l
Iodine-131	1 pCi/l
Cesium-134	10 pCi/l
Gross Beta	4 pCi/l
Other Radionuclides	1/10 of the applicable limit

406-A TOTAL TRIHALOMETHANES SAMPLING, ANALYTICAL AND OTHER REQUIREMENTS

A. Sampling and analyses made pursuant to this section shall be conducted by the total trihalomethane methods as directed in § 207 and in Technical Notes on Drinking Water Methods, EPA-600/R-94-173, October 1994, which is available at NTIS, PB95-104766.

APPENDIX B

PUBLIC NOTIFICATION OF DRINKING WATER VIOLATIONS

601-B NNPDWR Violations and Other Situations Requiring Public Notice[1]

Contaminant	MCL/MRD/TT violations[2]		Monitoring and Testing Procedure Violations	
	Tier of public notice required	Citation	Tier of public notice required	Citation
I. Violations of Navajo Nation Primary Drinking Water Regulations (NNPDWR): [3]				
A. Microbiological Contaminants				
1. Total coliform	2	205(B)(1)	3	404(A)-(E)
2. Fecal coliform/E. coli	1	205(C)(3)	[4]1, 3	404(E)
3. Turbidity MCL	2	206(A)	3	414
4. Turbidity MCL (average of 2 days' samples >5 NTU)	[5]2, 1	206(B)	3	414
5. Turbidity (for TT violations resulting from a single exceedance of maximum allowable turbidity level)	[6]2, 1	803(A)(2), 803(C)(2)(a), 805(A)(2), 805(B)(2), 805(C)(2), 805(D), 1305(A)(2), 1305(B), 2106(B)	3	Appendix D §801-D (A)(1), Appendix D §801-D (B)(2), Appendix D §801-D(C)(1), 1306, 2107 (A)(1)-(3), 2107 (B)
6. Surface Water Treatment Rule violations, other than violations resulting from single exceedance of max. allowable turbidity level (TT).	2	802-805	3	Appendix D
7. Interim Enhanced Surface Water Treatment Rule violations, other than violations resulting from single exceedance of max. turbidity level (TT)	2[7]	[7]1302-1305,2101-2104(A-D)	3	1304, 1306, 2104-2105, 2107
8. Filter Backwash Recycling Rule Violations	2	807	3	807
9. Long Term 1 Enhanced Surface Water Treatment Rule violations	2	2101-2106	3	2104-2105, 2107(A-E)
10. LT2ESWTR violations	2	2409-2419	[22]2,3	2402-2404, Appendix

Contaminant	MCL/MRD/TT violations[2]		Monitoring and Testing Procedure Violations	
	Tier of public notice required	Citation	Tier of public notice required	Citation
				G-2401-G - 2402-G, and 2407-2408
11. Ground Water Regulations violations	2	~~141.404~~ **2504**	3	~~141.402(h).~~ ~~141.403(d).~~ **2503(H)** **2504(D)**
B. Inorganic Chemicals (IOCs)				
1. Antimony	2	203(A)	3	405 (A), (B)
2. Arsenic	2	203(A) ~~178~~	3	~~1811~~405 (A), (B)
3. Asbestos (fibers >10 m)	2	203(A)	3	406
4. Barium	2	203(A)	3	405 (A), (B)
5. Beryllium	2	203(A)	3	405 (A), (B)
6. Cadmium	2	203(A)	3	405 (A), (B)
7. Chromium (total)	2	203(A)	3	405 (A), (B)
8. Cyanide	2	203(A)	3	405 (A), (B)
9. Fluoride	2	203(A)	3	405 (A), (B)
10. Mercury (inorganic)	2	203(A)	3	405 (A), (B)
11. Nitrate	1	203(A)	~~912~~1, 3	407
12. Nitrite	1	203(A)	~~912~~1, 3	408
13. Total Nitrate and Nitrite	1	203(A)	3	407
14. Selenium	2	204(A)	3	405 (A), (B)
15. Thallium	2	204(A)	3	405 (A), (B)
C. Lead and Copper Rule (Action Level for lead is 0.015 mg/L, for copper is 1.3 mg/L)				
1. Lead and Copper Rule (TT)	2	701-707	3	708-710, Appendix C

Contaminant	MCL/MRD/TT violations[2]		Monitoring and Testing Procedure Violations	
	Tier of public notice required	Citation	Tier of public notice required	Citation
D. Synthetic Organic Chemicals (SOCs)				
1. 2,4-D	2	204(A)(2)	3	410, Appendix A (§404-A)
2. 2,4,5-TP (Silvex)	2	204(A)(2)	3	410, Appendix A (§404-A)
3. Alachlor	2	204(A)(2)	3	410, Appendix A (§404-A)
4. Atrazine	2	204(A)(2)	3	410, Appendix A (§404-A)
5. Benzo(a)pyrene (PAHs)	2	204(A)(2)	3	410, Appendix A (§404-A)
6. Carbofuran	2	204(A)(2)	3	410, Appendix A (§404-A)
7. Chlordane	2	204(A)(2)	3	410, Appendix A (§404-A)
8. Dalapon	2	204(A)(2)	3	410, Appendix A (§404-A)
9. Di(2-ethylhexyl) adipate	2	204(A)(2)	3	410, Appendix A (§404-A)
10. Di(2-ethylhexyl) phthalate	2	204(A)(2)	3	410, Appendix A (§404-A)
11. Dibromochloropropane	2	204(A)(2)	3	410, Appendix A (§404-A)
12. Dinoseb	2	204(A)(2)	3	410, Appendix A (§404-A)
13. Dioxin (2,3,7,8-TCDD)	2	204(A)(2)	3	410, Appendix A (§404-A)
14. Diquat	2	204(A)(2)	3	410, Appendix A (§404-A)
15. Endothall	2	204(A)(2)	3	410, Appendix A (§404-A)
16. Endrin	2	204(A)(2)	3	410, Appendix A (§404-A)
17. Ethylene dibromide	2	204(A)(2)	3	410, Appendix A (§404-A)
18. Glyphosate	2	204(A)(2)	3	410, Appendix A (§404-A)
19. Heptachlor	2	204(A)(2)	3	410, Appendix A (§404-A)
20. Heptachlor epoxide	2	204(A)(2)	3	410, Appendix A (§404-A)
21. Hexachlorobenzene	2	204(A)(2)	3	410, Appendix A (§404-A)

Contaminant	MCL/MRD/TT violations[2]		Monitoring and Testing Procedure Violations	
	Tier of public notice required	Citation	Tier of public notice required	Citation
22. Hexachlorocyclopentadiene	2	204(A)(2)	3	410, Appendix A (§404-A)
23. Lindane	2	204(A)(2)	3	410, Appendix A (§404-A)
24. Methoxychlor	2	204(A)(2)	3	410, Appendix A (§404-A)
25. Oxamyl (Vydate)	2	204(A)(2)	3	410, Appendix A (§404-A)
26. Pentachlorophenol	2	204(A)(2)	3	410, Appendix A (§404-A)
27. Picloram	2	204(A)(2)	3	410, Appendix A (§404-A)
28. Polychlorinated biphenyls (PCBs)	2	204(A)(2)	3	410, Appendix A (§404-A)
29. Simazine	2	204(A)(2)	3	410, Appendix A (§404-A)
30. Toxaphene	2	204(A)(2)	3	410, Appendix A (§404-A)
E. Volatile Organic Chemicals (VOCs)				
1. Benzene	2	204(A)(1)	3	409, Appendix A (§404-A)
2. Carbon tetrachloride	2	204(A)(1)	3	409, Appendix A (§404-A)
3. Chlorobenzene (monochlorobenzene)	2	204(A)(1)	3	409, Appendix A (§404-A)
4. o-Dichlorobenzene	2	204(A)(1)	3	409, Appendix A (§404-A)
5. p-Dichlorobenzene	2	204(A)(1)	3	409, Appendix A (§404-A)
6. 1,2-Dichloroethane	2	204(A)(1)	3	409, Appendix A (§404-A)
7. 1,1-Dichloroethylene	2	204(A)(1)	3	409, Appendix A (§404-A)
8. cis-1,2-Dichloroethylene	2	204(A)(1)	3	409, Appendix A (§404-A)
9. trans-1,2-Dichloroethylene	2	204(A)(1)	3	409, Appendix A (§404-A)
10. Dichloromethane	2	204(A)(1)	3	409, Appendix A (§404-A)
11. 1,2-Dichloropropane	2	204(A)(1)	3	409, Appendix A (§404-A)
12. Ethylbenzene	2	204(A)(1)	3	409, Appendix A (§404-A)

Contaminant	MCL/MRD/TT violations[2]		Monitoring and Testing Procedure Violations	
	Tier of public notice required	Citation	Tier of public notice required	Citation
13. Styrene	2	204(A)(1)	3	409, Appendix A (§404-A)
14. Tetrachloroethylene	2	204(A)(1)	3	409, Appendix A (§404-A)
15. Toluene	2	204(A)(1)	3	409, Appendix A (§404-A)
16. 1,2,4-Trichlorobenzene	2	204(A)(1)	3	409, Appendix A (§404-A)
17. 1,1,1-Trichloroethane	2	204(A)(1)	3	409, Appendix A (§404-A)
18. 1,1,2-Trichloroethane	2	204(A)(1)	3	409, Appendix A (§404-A)
19. Trichloroethylene	2	204(A)(1)	3	409, Appendix A (§404-A)
20. Vinyl chloride	2	204(A)(1)	3	409, Appendix A (§404-A)
21. Xylenes (total)	2	204(A)(1)	3	409, Appendix A (§404-A)
F. Radioactive Contaminants				
1. Beta/photon emitters	2	209(A)(1)	3	Appendix A (§405-A), 412
2. Alpha emitters	2	209(A)(1)	3	Appendix A (§405-A), 411
3. Combined radium (226&228)	2	209(A)(1)	3	Appendix A (§405-A), 411
4. Uranium	2~~19~~ 9	209(A)(1)	3~~20~~ 10	Appendix A (§405-A), 411
G. Disinfection Byproducts (DBPs), Byproduct Precursors, Disinfectant Residuals. Where disinfection is used in the treatment of drinking water, disinfectants combine with organic and inorganic matter present in water to form chemicals called disinfection byproducts (DBPs). EPA sets standards for controlling the levels of disinfectants and DBPs in drinking water, including trihalomethanes (THMs) and haloacetic acids (HAAs).~~9~~ 13				
1. Total trihalomethanes (TTHMs)	2	207(B)~~10~~ 14	3	1103(a)-(b), 2201-2206, 2301-2310
2. Haloacetic Acids (HAA5)	2	207(B)	3	1103(a)-(b),2201-2206, 2301-2310
3. Bromate	2	207(A)(1)	3	1103(a)-(b)
4. Chlorite	2	207(A)(1)	3	1103(a)-(b)

Contaminant	MCL/MRD/TT violations[2]		Monitoring and Testing Procedure Violations	
	Tier of public notice required	Citation	Tier of public notice required	Citation
5. Chlorine (MRDL)	2	208(A)(1), 1104(C)(1)	3	1104(a), (c)
6. Chloramine (MRDL)	2	208(A)(1), 1104(C)(1)	3	1104(a), (c)
7. Chlorine dioxide (MRDL), where any 2 consecutive daily samples at entrance to distribution system only are above MRDL	2	208(A)(1), 1104(C)(2)	2 ~~11~~15, 3	1104(a), (c), 1105(c)(2)
8. Chlorine dioxide (MRDL), where sample(s) in distribution system the next day are also above MRDL	~~12~~14 1	208(A)(1), 1104(C)(2)	1	1104(a), (c), 1105(c)(2)
9. Control of DBP precursors--TOC (TT)	2	1106(a)-(b)	3	1103(a), (d)
10. Bench marking and disinfection profiling	N/A	N/A	3	1304, (reserved)
11. Development of monitoring plan	N/A	N/A	3	1103(f)
H. Other Treatment Techniques				
1. Acrylamide (TT)	2	1002	N/A	N/A
2. Epichlorohydrin (TT)	2	1002	N/A	N/A
II. Public Notification for Variances and Exemptions:				
A. Operation under a variance or exemption	3	~~13~~17 ~~601, 602, 603~~ NNSDWA, 22 N.N.C. 2561 & 2563	N/A	N/A
B. Violation of conditions of a variance or exemption	2	~~601, 602, 603~~ NNSDWA, 22 N.N.C. 2561 & 2563 ~~14~~18~~142.307~~ NNSDWA, 22 N.N.C. 2562	N/A	N/A
III. Other Situations Requiring Public Notification:				
A. Fluoride secondary maximum contaminant level (SMCL) exceedance	3	1803	N/A	N/A
B. Exceedance of nitrate MCL for non	1	202(C)	N/A	N/A

Contaminant	MCL/MRD/TT violations[2]		Monitoring and Testing Procedure Violations	
	Tier of public notice required	Citation	Tier of public notice required	Citation
community systems, as allowed by primacy agency	1	202(C)	N/A	N/A
C. Waterborne disease outbreak	1	104, 803(c)(2)(ii)	N/A	N/A
D. Other waterborne emergency[15]19	1	N/A	N/A	N/A
E. Other situations as determined by primacy agency	2120 1, 2, 3	N/A	N/A	N/A
F. Source Water Sample Positive for GWR Fecal indicators: E.coli, enterococci, or coliphage.	1	~~141.402(g)~~ 2502(G)	N/A	N/A

Appendix B--Endnotes

1. Violations and other situations not listed in this table (e.g., ~~reporting violations and~~ failure to prepare Consumer Confidence Reports) do not require notice unless otherwise determined by the primary agency. Primacy agencies may, at their option, also require a more stringent public notice tier (e.g., Tier 1 instead of Tier 2 or Tier 2 instead of Tier 3) for specific violations and situations listed in this Appendix, as authorized under § 604(a) and § 605(a).
2. MCL--Maximum contaminant level, MRDL--Maximum residual disinfectant level, TT--Treatment technique.
3. The term Violations of Navajo Nation Primary Drinking Water Regulations (NNPDWR) is used here to include violations of MCL, MRDL, treatment technique, monitoring, and testing procedure requirements.
4. Failure to test for fecal coliform or *E. coli* is a Tier 1 violation if testing is not done after any repeat sample tests positive for coliform. All other total coliform monitoring and testing procedure violations are Tier 3.
5. Systems that violate the turbidity MCL of 5 NTU based on an average of measurements over two consecutive days must consult with the primacy agency within 24 hours after learning of the violation. Based on this consultation, the primacy agency may subsequently decide to elevate the violation to Tier 1. If a system is unable to make contact with the primacy agency in the 24-hour period, the violation is automatically elevated to Tier 1.
6. Systems with treatment technique violations involving a single exceedance of a maximum turbidity limit under the Surface Water Treatment Rule (SWTR), the Interim Enhanced Surface Water Treatment Rule (IESWTR), or the Long Term 1 Enhanced Surface Water Treatment Rule(LT1ESWTR), are required to consult with the primacy agency within 24 hours after learning of the violation. Based on this consultation, the primacy agency may subsequently decide to elevate the violation to Tier 1. If a system is unable to make contact with the primacy agency in the 24-hour period, the violation is automatically elevated to Tier 1.
7. Most of the requirements of the Interim Enhanced Surface Water Treatment Rule (63 FR 69477) (§§ 1302-1303, 1305-1306) became effective January 1, 2002 for Part VIII (surface water systems and ground water systems under the direct influence of surface water) serving at least 10,000 persons. However, § 1304 has some requirements that became effective as early as April 16, 1999. The Surface Water Treatment Rule remains in effect for systems serving at least 10,000 persons even after 2002; the Interim Enhanced Surface Water Treatment Rule adds additional requirements and does not in many cases supercede the SWTR.
8. The arsenic MCL citations are effective January 23, 2006. Until then, the citations are § 202(A) and § 405(F)(4).
~~8~~9. The uranium MCL Tier 2 violation citations are effective December 8, 2003 for all community water systems.
10. The uranium MCL Tier 3 violation citations are effective December 8, 2000 for all community water systems.
11. The arsenic MCL Tier 3 violation citations are effective January 23, 2006. Until then, the citations are § 405(A) and (B).

12. Failure to take a confirmation sample within 24 hours for nitrate or nitrite after an initial sample exceeds the MCL is a Tier 1 violation. Other monitoring violations for nitrate are Tier 3.

~~9~~**13**. Part VIII community and non-transient non-community systems serving ≥10,000 persons must comply with new DBP MCLs, disinfectant MRDLs, and related monitoring requirements beginning January 1, 2002. All other community and non-transient non-community systems must meet the MCLs and MRDLs beginning January 1, 2004. Part VIII transient non-community systems serving 10,000 or more persons and using chlorine dioxide as a disinfectant or oxidant must comply with the chlorine dioxide MRDL beginning January 1, 2002. Part VIII transient non-community systems serving fewer than 10,000 persons and using only ground water not under the direct influence of surface water and using chlorine dioxide as a disinfectant or oxidant must comply with the chlorine dioxide MRDL beginning January 1, 2004.

~~10~~**14**. §§ 207(B)(1), 1103(A)-(B) apply until §§ 2301-2310 take effect under the schedule in § 2301 (C)

~~11~~**15**. Failure to monitor for chlorine dioxide at the entrance to the distribution system the day after exceeding the MRDL at the entrance to the distribution system is a Tier 2 violation.

~~12~~**16**. If any daily sample taken at the entrance to the distribution system exceeds the MRDL for chlorine dioxide and one or more samples taken in the distribution system the next day exceed the MRDL, Tier 1 notification is required. Failure to take the required samples in the distribution system after the MRDL is exceeded at the entry point also triggers Tier 1 notification.

~~13~~**17**. This citation refers to §§ 601~~-~~**602**~~-~~and 603 of the Navajo Nation Safe Drinking Water Act, which require that "a schedule prescribed . . . for a public water system granted a variance [or exemption] shall require compliance by the system . . ."

~~14~~**18**. In addition to §§ 1415 and 1416 of the Safe Drinking Water Act **and 602 of the Navajo Nation Safe Drinking Water Act**, 40 CFR 142.307 specifies the items and schedule milestones that must be included in a variance for small systems.

~~15~~**19**. Other waterborne emergencies require a Tier 1 public notice under § 604(a) for situations that do not meet the definition of a waterborne disease outbreak given in §104 but that still have the potential to have serious adverse effects on health as a result of short-term exposure. These could include outbreaks not related to treatment deficiencies, as well as situations that have the potential to cause outbreaks, such as failures or significant interruption in water treatment processes, natural disasters that disrupt the water supply or distribution system, chemical spills, or unexpected loading of possible pathogens into the source water.

~~16~~**20**. Primacy agencies may place other situations in any tier they believe appropriate, based on threat to public health.

~~17. The arsenic MCL citations are effective January 23, 2006.~~

~~18. The arsenic Tier 3 violation MCL citations are effective January 23, 2006.~~

~~19. The uranium MCL Tier 2 violation citations are effective December 8, 2003 for all community water systems.~~

~~20. The uranium Tier 3 violation citations are effective December 8, 2003 for all community water systems.~~

~~21. Primacy agencies may place other situations in any tier they believe appropriate based on threat to public health.~~

~~22~~**21**. Failure to collect three or more samples for Cryptosporidium analysis is a Tier 2 violation requiring special notice as specified in § 612. All other monitoring and testing procedure violations are Tier 3.

602-B Standard Health Effects Language for Public Notification

Contaminant	MCLG[1] mg/L	MCL[2] mg/L	Standard Health Effects Language for Public Notification
A. Microbiological Contaminants:			
1a. Total Coliform	Zero	See footnote 3	Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other, potentially-harmful, bacteria may be present. Coliforms were found in more samples than allowed and this was a warning of potential problems.
1b. Fecal coliform/E. coli	Zero	Zero	Fecal coliforms and E. coli are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely compromised immune systems.
1c. Fecal Indicators (GWR) i. E. coli ii. enterococci iii.coliphage	 Zero None None	 TT TT TT	Fecal indicators are microbes whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term health effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely compromised immune systems.
1d. Ground Water Regulations (GWR) TT violations	None	TT	Inadequately treated or inadequately protected water may contain disease-causing organisms. These organisms can cause symptoms such as diarrhea, nausea, cramps, and associated headaches.
2a. Turbidity (MCL)[4]	None	1 NTU[5]/5 NTU	Turbidity has no health effects. However, turbidity can interfere with disinfection and provide a medium for microbial growth. Turbidity may indicate the presence of disease-causing organisms. These organisms include bacteria, viruses, and parasites that can cause symptoms such as nausea, cramps, diarrhea, and associated headaches.
2b. Turbidity (SWTR TT)[6]	None	TT[7]	Turbidity has no health effects. However, turbidity can interfere with disinfection and provide a medium for microbial growth. Turbidity may indicate the presence of disease-causing organisms. These organisms include bacteria, viruses, and parasites that can cause symptoms such as nausea, cramps, diarrhea, and associated headaches.
2c. Turbidity (IESWTR TT and LT1ESWTR TT)[8]	None	TT	Turbidity has no health effects. However, turbidity can interfere with disinfection and provide a medium for microbial growth. Turbidity may indicate the presence of disease-causing organisms. These organisms include bacteria, viruses, and parasites that can cause symptoms such as nausea, cramps, diarrhea, and associated headaches.
B. Surface Water Treatment Rule (SWTR), Interim Enhanced Surface Water Treatment Rule (IESWTR), Long Term 1 Enhanced Surface Water Treatment Rule (LT1ESWTR), and the Filter Backwash Recycling Rule (FBRR) violations:			

Contaminant	MCLG[1] mg/L	MCL[2] mg/L	Standard Health Effects Language for Public Notification
3. Giardia lamblia (SWTR/ IESWTR/ LT1ESWTR). 4. Viruses (SWTR/IESWTR/LT1ESWTR). 5. Heterotrophic plate count (HPC) bacteria [9] (SWTR/IESWTR/LT1ESWTR). 6. Legionella (SWTR/IESWTR/LT1ESWTR). 7. Cryptosporidium (IESWTR/FBRR/LT1ESWTR).	Zero	TT [10]	Inadequately treated water may contain disease-causing organisms. These organisms include bacteria, viruses, and parasites which can cause symptoms such as nausea, cramps, diarrhea, and associated headaches.
C. Inorganic Chemicals (IOCs)			
8. Antimony	0.006	0.006	Some people who drink water containing antimony well in excess of the MCL over many years could experience increases in blood cholesterol and decreases in blood sugar.
9. Arsenic[22]11	~~None~~ 0	0.010	Some people who drink water containing arsenic in excess of the MCL over many years could experience skin damage or problems with their circulatory system, and may have an increased risk of getting cancer.
10. Asbestos (10 µm)	7 MFL [11]12	7 MFL	**Some people who drink water containing a**sbestos in excess of the MCL over many years may have an increased risk of developing benign intestinal polyps.
11. Barium	2	2	Some people who drink water containing barium in excess of the MCL over many years could experience an increase in their blood pressure.
12. Beryllium	0.004	0.004	Some people who drink water containing beryllium well in excess of the MCL over many years could develop intestinal lesions.
13. Cadmium	0.005	0.005	Some people who drink water containing cadmium in excess of the MCL over many years could experience kidney damage.
14. Chromium (total)	0.1	0.1	Some people who use water containing chromium well in excess of the MCL over many years could experience allergic dermatitis.
15. Cyanide	0.2	0.2	Some people who drink water containing cyanide well in excess of the MCL over many years could experience nerve damage or problems with their thyroid.
16. Fluoride	4.0	4.0	Some people who drink water containing fluoride in excess of the MCL over many years could get bone disease, including pain and tenderness of the bones. Fluoride in drinking water at half the MCL or more may cause mottling of children's teeth, usually in children less than nine years old. Mottling, also known as dental fluorosis, may include brown staining and/or pitting of the teeth, and occurs only in developing teeth before

Contaminant	MCLG[1] mg/L	MCL[2] mg/L	Standard Health Effects Language for Public Notification
			they erupt from the gums.
17. Mercury (inorganic)	0.002	0.002	Some people who drink water containing inorganic mercury well in excess of the MCL over many years could experience kidney damage.
18. Nitrate	10	10	Infants below the age of six months who drink water containing nitrate in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue baby syndrome.
19. Nitrite	1	1	Infants below the age of six months who drink water containing nitrite in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue baby syndrome.
20. Total Nitrate and Nitrite	10	10	Infants below the age of six months who drink water containing nitrate and nitrite in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue baby syndrome.
21. Selenium	0.05	0.05	Selenium is an essential nutrient. However, some people who drink water containing selenium in excess of the MCL over many years could experience hair or fingernail losses, numbness in fingers or toes, or problems with their circulation.
22. Thallium	0.0005	0.002	Some people who drink water containing thallium in excess of the MCL over many years could experience hair loss, changes in their blood, or problems with their kidneys, intestines, or liver.
D. Lead and Copper Requirements:			
23. Lead	Zero	TT ~~12~~13	Infants and children who drink water containing lead in excess of the action level could experience delays in their physical or mental development. Children could show slight deficits in attention span and learning abilities. Adults who drink this water over many years could develop kidney problems or high blood pressure.
24. Copper	1.3	TT ~~13~~14	Copper is an essential nutrient, but some people who drink water containing copper in excess of the action level over a relatively short amount of time could experience gastrointestinal distress. Some people who drink water containing copper in excess of the action level over many years could suffer liver or kidney damage. People with Wilson's Disease should consult their personal doctor.
E. Synthetic Organic Chemicals (SOCs):			
25. 2,4-D	0.07	0.07	Some people who drink water containing the weed killer 2,4-D well in excess of the MCL over many years could experience problems with their kidneys, liver, or adrenal glands.
			Some people who drink water containing silvex in excess of the MCL over

Contaminant	MCLG[1] mg/L	MCL[2] mg/L	Standard Health Effects Language for Public Notification
26. 2,4,5-TP (Silvex)	0.05	0.05	many years could experience liver problems.
27. Alachlor	Zero	0.002	Some people who drink water containing alachlor in excess of the MCL over many years could have problems with their eyes, liver, kidneys, or spleen, or experience anemia, and may have an increased risk of getting cancer.
28. Atrazine	0.003	0.003	Some people who drink water containing atrazine well in excess of the MCL over many years could experience problems with their cardiovascular system or reproductive difficulties.
29. Benzo(a)pyrene (PAHs)	Zero	0.0002	Some people who drink water containing benzo(a)pyrene in excess of the MCL over many years may experience reproductive difficulties and may have an increased risk of getting cancer.
30. Carbofuran	0.04	0.04	Some people who drink water containing carbofuran in excess of the MCL over many years could experience problems with their blood, or nervous or reproductive systems.
31. Chlordane	Zero	0.002	Some people who drink water containing chlordane in excess of the MCL over many years could experience problems with their liver or nervous system, and may have an increased risk of getting cancer.
32. Dalapon	0.2	0.2	Some people who drink water containing dalapon well in excess of the MCL over many years could experience minor kidney changes.
33. Di(2-ethylhexyl)adipate.	0.4	0.4	Some people who drink water containing di (2-ethylhexyl) adipate well in excess of the MCL over many years could experience general toxic effects such as weight loss, liver enlargement or possible reproductive difficulties.
34. Di (2-ethylhexyl)phthalate	Zero	0.006	Some people who drink water containing di(2-ethylhexyl) phthalate in excess of the MCL over many years may have problems with their liver, or experience reproductive difficulties, and may have an increased risk of getting cancer.
35. Dibromochloropropane (DBCP)	Zero	0.0002	Some people who drink water containing DBCP in excess of the MCL over many years could experience reproductive difficulties and may have an increased risk of getting cancer.
36. Dinoseb	0.007	0.007	Some people who drink water containing dinoseb well in excess of the MCL over many years could experience reproductive difficulties.
37. Dioxin (2,3,7,8-TCDD)	Zero	3×10^{-8}	Some people who drink water containing dioxin in excess of the MCL over many years could experience reproductive difficulties and may have an increased risk of getting cancer.
38. Diquat	0.02	0.02	Some people who drink water containing diquat in excess of the MCL over many years could get cataracts.

Contaminant	MCLG[1] mg/L	MCL[2] mg/L	Standard Health Effects Language for Public Notification
39. Endothall	0.1	0.1	Some people who drink water containing endothall in excess of the MCL over many years could experience problems with their stomach or intestines.
40. Endrin	0.002	0.002	Some people who drink water containing endrin in excess of the MCL over many years could experience liver problems.
41. Ethylene dibromide	Zero	0.00005	Some people who drink water containing ethylene dibromide in excess of the MCL over many years could experience problems with their liver, stomach, reproductive system, or kidneys, and may have an increased risk of getting cancer.
42. Glyphosate	0.7	0.7	Some people who drink water containing glyphosate in excess of the MCL over many years could experience problems with their kidneys or reproductive difficulties.
43. Heptachlor	Zero	0.0004	Some people who drink water containing heptachlor in excess of the MCL over many years could experience liver damage and may have an increased risk of getting cancer.
44. Heptachlor epoxide	Zero	0.0002	Some people who drink water containing heptachlor epoxide in excess of the MCL over many years could experience liver damage, and may have an increased risk of getting cancer.
45. Hexachlorobenzene	Zero	0.001	Some people who drink water containing hexachlorobenzene in excess of the MCL over many years could experience problems with their liver or kidneys, or adverse reproductive effects, and may have an increased risk of getting cancer.
46. Hexachlorocyclo pentadiene	0.05	0.05	Some people who drink water containing hexachlorocyclopentadiene well in excess of the MCL over many years could experience problems with their kidneys or stomach.
47. Lindane	0.0002	0.0002	Some people who drink water containing lindane in excess of the MCL over many years could experience problems with their kidneys or liver.
48. Methoxychlor	0.04	0.04	Some people who drink water containing methoxychlor in excess of the MCL over many years could experience reproductive difficulties.
49. Oxamyl (Vydate)	0.2	0.2	Some people who drink water containing oxamyl in excess of the MCL over many years could experience slight nervous system effects.
50. Pentachlorophenol	Zero	0.001	Some people who drink water containing pentachlorophenol in excess of the MCL over many years could experience problems with their liver or kidneys, and may have an increased risk of getting cancer.
51. Picloram	0.5	0.5	Some people who drink water containing picloram in excess of the MCL over many years could experience problems with their liver.
52. Polychlorinated biphenyls			Some people who drink water containing PCBs in excess of the MCL over many

Contaminant	MCLG[1] mg/L	MCL[2] mg/L	Standard Health Effects Language for Public Notification
(PCBs)	Zero	0.0005	years could experience changes in their skin, problems with their thymus gland, immune deficiencies, or reproductive or nervous system difficulties, and may have an increased risk of getting cancer.
53. Simazine	0.004	0.004	Some people who drink water containing simazine in excess of the MCL over many years could experience problems with their blood.
54. Toxaphene	Zero	0.003	Some people who drink water containing toxaphene in excess of the MCL over many years could have problems with their kidneys, liver, or thyroid, and may have an increased risk of getting cancer.
F. Volatile Organic Chemicals (VOCS)			
55. Benzene	Zero	0.005	Some people who drink water containing benzene in excess of the MCL over many years could experience anemia or a decrease in blood platelets, and may have an increased risk of getting cancer.
56. Carbon tetrachloride	Zero	0.005	Some people who drink water containing carbon tetrachloride in excess of the MCL over many years could experience problems with their liver and may have an increased risk of getting cancer.
57. Chlorobenzene **(monochlorobenzene)**	0.1	0.1	Some people who drink water containing chlorobenzene in excess of the MCL over many years could experience problems with their liver or kidneys.
58. o-Dichlorobenzene	0.6	0.6	Some people who drink water containing o-dichlorobenzene well in excess of the MCL over many years could experience problems with their liver, kidneys, or circulatory systems.
59. p-Dichlorobenzene	0.075	0.075	Some people who drink water containing p-dichlorobenzene in excess of the MCL over many years could experience anemia, damage to their liver, kidneys, or spleen, or changes in their blood.
60. 1,2-Dichloroethane	Zero	0.005	Some people who drink water containing 1,2-dichloroethane in excess of the MCL over many years may have an increased risk of getting cancer.
61. 1,1-Dichloroethylene	0.007	0.007	Some people who drink water containing 1,1-dichloroethylene in excess of the MCL over many years could experience problems with their liver.
62. cis-1,2-Dichloroethylene	0.07	0.07	Some people who drink water containing cis-1,2-dichloroethylene in excess of the MCL over many years could experience problems with their liver.
63. trans-1,2-Dichloroethylene	0.1	0.1	Some people who drink water containing trans-1,2-dichloroethylene well in excess of the MCL over many years could experience problems with their liver.
64. Dichloromethane	Zero	0.005	Some people who drink water containing dichloromethane in excess of the MCL over many years could have liver problems and may have an increased risk of getting cancer.

Contaminant	MCLG[1] mg/L	MCL[2] mg/L	Standard Health Effects Language for Public Notification
65. 1,2-Dichloropropane	Zero	0.005	Some people who drink water containing 1,2-dichloropropane in excess of the MCL over many years may have an increased risk of getting cancer.
66. Ethylbenzene	0.7	0.7	Some people who drink water containing ethylbenzene well in excess of the MCL over many years could experience problems with their liver or kidneys.
67. Styrene	0.1	0.1	Some people who drink water containing styrene well in excess of the MCL over many years could have problems with their liver, kidneys, or circulatory system.
68. Tetrachloroethylene	Zero	0.005	Some people who drink water containing tetrachloroethylene in excess of the MCL over many years could have problems with their liver, and may have an increased risk of getting cancer.
69. Toluene	1	1	Some people who drink water containing toluene well in excess of the MCL over many years could have problems with their nervous system, kidneys, or liver.
70. 1,2,4-Trichlorobenzene	0.07	0.07	Some people who drink water containing 1,2,4-trichlorobenzene well in excess of the MCL over many years could experience changes in their adrenal glands.
71. 1,1,1-Trichloroethane	0.2	0.2	Some people who drink water containing 1,1,1-trichloroethane in excess of the MCL over many years could experience problems with their liver, nervous system, or circulatory system.
72. 1,1,2-Trichloroethane	0.003	0.005	Some people who drink water containing 1,1,2-trichloroethane well in excess of the MCL over many years could have problems with their liver, kidneys, or immune systems.
73. Trichloroethylene	Zero	0.005	Some people who drink water containing trichloroethylene in excess of the MCL over many years could experience problems with their liver and may have an increased risk of getting cancer.
74. Vinyl chloride	Zero	0.002	Some people who drink water containing vinyl chloride in excess of the MCL over many years may have an increased risk of getting cancer.
75. Xylenes (total)	10	10	Some people who drink water containing xylenes in excess of the MCL over many years could experience damage to their nervous system.
G. Radioactive Contaminants:			
76. Beta/photon emitters	Zero	4 mrem/yr[14][15]	Certain minerals are radioactive and may emit forms of radiation known as photons and beta radiation. Some people who drink water containing beta and photon emitters in excess of the MCL over many years may have an increased risk of getting cancer.
77. Alpha emitters	Zero	15 pCi/L[15][16]	Certain minerals are radioactive and may emit a form of radiation known as alpha radiation. Some people who drink water containing alpha emitters

Contaminant	MCLG[1] mg/L	MCL[2] mg/L	Standard Health Effects Language for Public Notification
			in excess of the MCL over many years may have an increased risk of getting cancer.
78. Combined radium (226 & 228)	Zero	5 pCi/L	Some people who drink water containing radium 226 or 228 in excess of the MCL over many years may have an increased risk of getting cancer.
79. Uranium[~~23~~17]	Zero	30μg/L	Some people who drink water containing uranium in excess of the MCL over many years may have an increased risk of getting cancer and kidney toxicity.
H. Disinfection Byproducts (DBPs), Byproduct Precursors, and Disinfectant Residuals: Where disinfection is used in the treatment of drinking water, disinfectants combine with organic and inorganic matter present in water to form chemicals called disinfection byproducts (DBPs). EPA sets standards for controlling the levels of disinfectants and DBPs in drinking water, including trihalomethanes (THMs) and haloacetic acids (HAAs): [~~16~~18]			
80. Total trihalomethanes (TTHMs)	N/A	0.080[~~17, 18~~19, 20]	Some people who drink water containing trihalomethanes in excess of the MCL over many years may experience problems with their liver, kidneys, or central nervous system, and may have an increased risk of getting cancer.
81. Haloacetic Acids (HAA)	N/A	0.060[~~19~~21]	Some people who drink water containing haloacetic acids in excess of the MCL over many years may have an increased risk of getting cancer.
82. Bromate	Zero	0.010	Some people who drink water containing bromate in excess of the MCL over many years may have an increased risk of getting cancer.
83. Chlorite	0.08	1.0	Some infants and young children who drink water containing chlorite in excess of the MCL could experience nervous system effects. Similar effects may occur in fetuses of pregnant women who drink water containing chlorite in excess of the MCL. Some people may experience anemia.
84. Chlorine	4 (MRDLG)[~~20~~22]	4 (MRDL)[~~21~~23]	Some people who use water containing chlorine well in excess of the MRDL could experience irritating effects to their eyes and nose. Some people who drink water containing chlorine well in excess of the MRDL could experience stomach discomfort.
85. Chloramines	4 (MRDLG)	4 (MRDL)	Some people who use water containing chloramines well in excess of the MRDL could experience irritating effects to their eyes and nose. Some people who drink water containing chloramines well in excess of the MRDL could experience stomach discomfort or anemia.
86a. Chlorine dioxide, where any 2 consecutive samples taken at the entrance to the distribution system are above the MRDL.	0.8 (MRDLG)	0.8 (MRDL)	Some infants and young children who drink water containing chlorine dioxide in excess of the MRDL could experience nervous system effects. Similar effects may occur in fetuses of pregnant women who drink water containing chlorine dioxide in excess of the MRDL. Some people may experience anemia. Add for public notification only: The chlorine dioxide violations

Contaminant	MCLG[1] mg/L	MCL[2] mg/L	Standard Health Effects Language for Public Notification
			reported today are the result of exceedances at the treatment facility only, not within the distribution system which delivers water to consumers. Continued compliance with chlorine dioxide levels within the distribution system minimizes the potential risk of these violations to consumers.
86b. Chlorine dioxide, where one or more distribution system samples are above the MRDL.	0.8 (MRDLG)	0.8 (MRDL)	Some infants and young children who drink water containing chlorine dioxide in excess of the MRDL could experience nervous system effects. Similar effects may occur in fetuses of pregnant women who drink water containing chlorine dioxide in excess of the MRDL. Some people may experience anemia. Add for public notification only: The chlorine dioxide violations reported today include exceedances of the EPA standard within the distribution system which delivers water to consumers. Violations of the chlorine dioxide standard within the distribution system may harm human health based on short-term exposures. Certain groups, including fetuses, infants, and young children, may be especially susceptible to nervous system effects from excessive chlorine dioxide exposure.
87. Control of DBP precursors (TOC)	None	TT	Total organic carbon (TOC) has no health effects. However, total organic carbon provides a medium for the formation of disinfection byproducts. These byproducts include trihalomethanes (THMs) and haloacetic acids (HAAs). Drinking water containing these byproducts in excess of the MCL may lead to adverse health effects, liver or kidney problems, or nervous system effects, and may lead to an increased risk of getting cancer.
I. Other Treatment Techniques:			
88. Acrylamide	Zero	TT	Some people who drink water containing high levels of acrylamide over a long period of time could have problems with their nervous system or blood, and may have an increased risk of getting cancer.
89. Epichlorohydrin	Zero	TT	Some people who drink water containing high levels of epichlorohydrin over a long period of time could experience stomach problems, and may have an increased risk of getting cancer.

1. MCLG--Maximum contaminant level goal.
2. MCL--Maximum contaminant level.
3. For water systems analyzing at least 40 samples per month, no more than 5.0 percent of the monthly samples may be positive for total coliforms. For systems analyzing fewer than 40 samples per month, no more than one sample per month may be positive for total coliforms.
4. There are various regulations that set turbidity standards for different types of systems, including §206, the 1989 Surface Water Treatment Rule, and the 1998 Interim Enhanced Surface Water Treatment Rule~~.~~**, and the 2002 Long Term 1 Enhanced Surface Water Treatment Rule.** The MCL for the monthly turbidity average is 1 NTU; the MCL for the 2-day average is 5 NTU for systems that are required to filter but have not yet installed filtration (§ 206).
5. NTU--Nephelometric turbidity unit.
6. There are various regulations that set turbidity standards for different types of systems, including §206, the 1989 Surface Water Treatment Rule (SWTR), and the 1998 Interim Enhanced Surface Water Treatment Rule (IESWTR)~~.~~**, and the 2001 Long Term 1 Enhanced Surface Water Treatment Rule.**

Systems subject to the Surface Water Treatment Rule (both filtered and unfiltered) may not exceed 5 NTU. In addition, in filtered systems, 95 percent of samples each month must not exceed 0.5 NTU in systems using conventional or direct filtration and must not exceed 1 NTU in systems using slow sand or diatomaceous earth filtration or other filtration technologies approved by the primacy agency.
7. TT--Treatment technique.
8. There are various regulations that set turbidity standards for different types of systems, including §206, the 1989 Surface Water Treatment Rule (SWTR), and the 1998 Interim Enhanced Surface Water Treatment Rule (IESWTR) ~~.~~**, and the 2002 Long Term 1 Enhanced Surface Water Treatment Rule (LT1ESWTR).** For systems subject to the IESWTR (systems serving at least 10,000 people, using surface water or ground water under the direct influence of surface water), that use conventional filtration or direct filtration, after January 1, 2002, the turbidity level of a system's combined filter effluent may not exceed 0.3 NTU in at least 95 percent of monthly measurements, and the turbidity level of a system's combined filter effluent must not exceed 1 NTU at any time. Systems subject to the IESWTR using technologies other than conventional, direct, slow sand, or diatomaceous earth filtration must meet turbidity limits set by the primacy agency. **For systems subject to the LT1ESWTR (systems serving fewer than 10,000 people, using surface water or ground water under the direct influence of surface water) that use conventional filtration or direct filtration, after January 1, 2005, the turbidity level of a system's combined filter effluent may not exceed 0.3 NTU in at least 95 percent of monthly measurements, and the turbidity level of a system's combined filter effluent must not exceed 1 NTU at any time. Systems subject to the LT1ESWTR using technologies other than conventional direct, slow sand, or diatomaceous earth filtration must meet turbidity limits set by the primacy agency.**
9. The bacteria detected by heterotrophic plate count (HPC) are not necessarily harmful. HPC is simply an alternative method of determining disinfectant residual levels. The number of such bacteria is an indicator of whether there is enough disinfectant in the distribution system.
10. SWTR ~~and~~ , IESWTR**, and LT1ESWTR** treatment technique violations that involve turbidity exceedances may use the health effects language for turbidity instead.
11. These arsenic values are effective January 23, 2006. Until then, the MCL is 0.05 mg/L and there is no MCLG.
~~11~~**12**. Millions fibers per liter.
~~12~~**13**. Action Level = 0.015 mg/L.
~~13~~**14**. Action Level = 1.3 mg/L.
~~14~~**15**. Millirems per years.
~~15~~**16.** Picocuries per liter.
~~23~~**17**. **The uranium MCL is effective December 8, 2003 for all community water systems.**
~~16~~**18**. Surface water systems and ground water systems under the direct influence of surface water are regulated under Part VIII. Part VIII community and non-transient non-community systems serving ≥10,000 persons must comply with Part XI DBP MCLs and disinfectant maximum residual disinfectant levels (MRDLs) beginning January 1, 2002. All other community and non-transient noncommunity systems must comply with Part XI DBP MCLs and disinfectant MRDLs beginning January 1, 2005. Part VIII transient non-community systems serving ≥10,000 that use chlorine dioxide as a disinfectant or oxidant must comply with the chlorine dioxide MRDL beginning January 1, 2002. All other transient non-community systems that use chlorine dioxide as a disinfectant or oxidant must comply with the chlorine dioxide MRDL beginning January 1, 2004.
~~17~~**19**. Community and non-transient non-community systems must comply with Part XXIII TTHM and HAA5 MCLs of 0.080mg/L and 0.060mg/L respectively (with compliance calculated as a locational running annual average) on the schedule in § 2301.
~~18~~**20**. The MCL for total trihalomethanes is the sum of the concentrations of the individual trihalomethanes.
~~19~~**21**. The MCL for haloacetic acids is the sum of the concentrations of the individual haloacetic acids.
~~20~~**22**. MRDLG--Maximum residual disinfectant level goal.
~~21~~**23**. MRDL--Maximum residual disinfectant level.
~~22. These arsenic values are effective January 23, 2006.~~
~~23. The uranium MCL is effective December 8, 2003 for all community water systems.~~

603-B List of Acronyms Used in Public Notification Regulation

CCR	Consumer Confidence Report	NTNCWS	Non-Transient Non-Community Water System
CWS	Community Water System	NTU	Nephelometric Turbidity Unit
DBP	Disinfection Byproduct	OGWDW	Office of Ground Water and Drinking Water

EPA	Environmental Protection Agency	OW	Office of Water
HPC	Heterotrophic Plate Count	PN	Public Notification
IESWTR	Interim Enhanced Surface Water Treatment Rule	PWS	Public Water System
IOC	Inorganic Chemical	SDWA	Safe Drinking Water Act
GWR	Ground Water Rule	SMCL	Secondary Maximum Contaminant Level
LCR	Lead and Copper Rule	SOC	Synthetic Organic Chemical
MCL	Maximum Contaminant Level	SWTR	Surface Water Treatment Rule
MCLG	Maximum Contaminant Level Goal	TCR	Total Coliform Rule
MRDL	Maximum Residual Disinfectant Level	TT	Treatment Technique
MRDLG	Maximum Residual Disinfectant Level Goal	TWS	Transient Non-Community Water System
NCWS	Non-Community Water System	VOC	Volatile Organic Chemical
NPDWR	National Primary Drinking Water Regulation	LT1ESTR	Long Term 1 Enhanced Surface Water Treatment Rule

APPENDIX D
SURFACE WATER TREATMENT

801-D ANALYTICAL AND SAMPLING REQUIREMENTS

A. ANALYTICAL REQUIREMENTS. Only the analytical method(s) specified in this subsection, or otherwise approved by the EPA, may be used to demonstrate compliance with the requirements of §§ 803, 804, and 805. Measurements for pH, temperature, turbidity, and residual disinfectant concentrations must be conducted by a party approved by the Director. Measurements for total coliforms, fecal coliforms, and HPC must be conducted by a laboratory certified by the EPA to do such analysis. Until laboratory certification criteria are developed for the analysis of HPC and fecal coliforms, any laboratory certified for total coliform analysis by EPA is deemed certified for HPC and fecal coliform analysis. The following procedures shall be conducted in accordance with the publications listed in the following section. Copies of the methods published in *Standard Methods for the Examination of Water and Wastewater* may be obtained from the American Public Health Association et al., 1015 Fifteenth Street, NW., Washington, DC, 20005; copies of the Minimal Medium ONPG-MUG Method as set forth in the article "National Field Evaluation of a Defined Substrate Method for the Simultaneous Enumeration of Total Coliforms and *Escherichia coli* from Drinking Water: Comparison with the Standard Multiple Tube Fermentation Method" (Edberg et al.), Applied and Environmental Microbiology, Volume 54, PP. 1595-1601, June 1988 (as amended under Erratum, Applied and Environmental Microbiology, Volume 54 p. 3197, December, 1988), may be obtained from the American Water Works Association Research Foundation, 6666 West Quincy Avenue, Denver, Colorado, 80235; and copies of the Indigo Method as set forth in the article "Determination of Ozone in Water by the Indigo Method" (Bader and Hoigne), may be obtained from Ozone Science & Engineering, Pergamon Press Ltd., Fairview Park, Elmsford, New York, 10523. Copies may be inspected at the U.S.EPA, Room EB15, 401 M Street, SW., Washington, DC, 20460 or at the Office of the Federal Register, 800 North Capitol Street, NW., Suite 700, Washington, DC.

1. Public water systems must conduct analysis of pH in accordance with one of the methods listed in Appendix A § 403-A (A)(1) Table 400-A-3. Water systems must conduct analyses of total coliforms, fecal coliforms, heterotrophic bacteria, **and** turbidity ~~and temperature~~ in accordance with one of the following analytical methods**, or one of the alternative methods listed in Appendix A to subpart C of 40 C.F.R. pt. 141,** and by using analytical test procedures contained in *Technical Notes on Drinking Water Methods*, EPA-600/R-94-173, October 1994~~, which is available at NTIS PB 95-104766.~~**. This document is available from the National Service Center for Environmental Publications (NSCEP), P.O. Box 42419, Cincinnati, OH 45242-0419 or http://www.epa.gov/nscep/.**

TABLE 800-D-1 ANALYTICAL METHODS

Organism	Methodology	Citation[1]
Total Coliforms [2]	Total Coliform Fermentation technique [3,4,5] Total Coliform Membrane Filter technique [6] ONPG-MUG Test [7]	9221A, B, C 9222A, B, C 9223
Fecal Coliforms [2]	Fecal Coliform Procedure [8] Fecal Coliforms Filter Procedure	9221E 9222D
Heterotrophic bacteria [2]	Pour Plate Method	9215B
Turbidity	Nephelometric Method Nephelometric Method Great lakes instruments	2130B 180.1 [8] Method 2 [9]
Temperature		2550

The procedures shall be done in accordance with the documents listed below. Copies of the documents may be obtained from the sources listed below. Information regarding obtaining these documents can be obtained from the Safe Drinking Water Hotline at 800-426-4791. Documents may be inspected at EPA's Drinking Water Docket, 1200 Pennsylvania Ave., NW., Washington, D.C. 20460 (Telephone: 202-260-3027); or at the Office of the Federal Register, 800 North Capitol Street, NW, Suite 700, Washington, D.C. 20408.

[1] Except where noted, all methods refer to Standard Methods for the Examination of Water and Wastewater, 18th edition, 1992, and 19th edition, 1995, American Public Health Association, 1015 Fifteenth Street NW, Washington, D.C., 20005.
[2] The time from sample collection to initiation of analysis may not exceed 8 hours. Systems must hold samples below 10°C during transit.
[3] Lactose broth, as commercially available, may be used in lieu of lauryl tryptose broth, if the system conducts at least 25 parallel tests between this medium and lauryl tryptose broth using the water normally tested, and this comparison demonstrates that the false-positive rate and false-negative rate for total coliforms, using lactose broth, is less than 10%.
[4] Media should cover inverted tubes at least one-half to two-thirds after the sample is added.
[5] No requirement exists to run the completed phase on 10% of all total coliform-positive confirmed tubes.
[6] The ONPG-MUG test is also known as the Autoanalysis Colilert System.
[7] A-1 Broth may be held up to three months in a tightly closed screwcap tube at 4°C.
[8] "Methods for the Determination of Inorganic Substances in Environmental Samples", EPA-600/R-93-100, August 1993. Available at NTIS, PB94-121811.
[9] GLI Method 2, "Turbidity", November 2, 1992, Great Lakes Instruments, Inc., 8855 North 55th Street, Milwaukee, Wisconsin 53223.

2. Water systems must measure residual disinfectant concentrations with one of the analytical methods in the following table **or one of the alternative methods listed in Appendix A to subpart C of 40 C.F.R. pt. 141.** ~~The methods are contained in the 18th, 19th, and 20th editions of Standard Methods for the Examination of Water and Wastewater, 1992 and 1995; any of these three editions may be used. Other analytical test procedures are contained in Technical Notes on Drinking Water Methods, EPA 600/R-94-173, October 1994, which is available at NTIS PB95-104766.~~ If approved by **the Director**~~EPA~~, residual disinfectant concentrations for free chlorine and combined chlorine also may be measured by using DPD colorimetric test kits. **In addition, the Director may approve the use of the ITS free chlorine test strip for the determination of free chlorine. Use of the test strips is described in Method D99-003, "Free Chlorine Species (HOCl- and OCl-) by Test Strip," Revision 3.0, November 21, 2003, available from Industrial Test Systems, Inc., 1875 Langston St., Rock Hill, SC 29730.** Free and total chlorine residuals may be measured continuously by adapting a specified chlorine residual method for use with a continuous monitoring instrument provided the chemistry, accuracy, and precision remain the same. Instruments used for continuous monitoring must be calibrated with a grab sample measurement at least every five days, or with a protocol approved by **the Director**~~EPA~~.

Table 800-D-2 RESIDUAL DISINFECTANT CONCENTRATIONS ANALYTICAL METHODS

Residual	Methodology	Methods
Free chlorine	Amperometric Titration DPD Ferrous Titrimetric DPD Colorimetric Syringaldazine (FACTS)	4500-Cl D 4500-Cl F 4500-Cl G 4500-Cl H
Total Chlorine	Amperometric Titration Amperometric Titration (low level measurement) DPD Ferrous Titrimetric DPD Colorimetric Iodometric Electrode	4500-Cl D 4500-Cl E 4500-Cl F 4500-Cl G 4500-Cl I
Chlorine dioxide	Amperometric Titration DPD Method Amperometric Titration Spectrophotometric	4500-ClO_2 C 4500-ClO_2 D 4500-ClO_2 E EPA Method 327.0, Rev. 1.1
Ozone	Indigo Method	4500-O_3 B

[1] EPA Method 327.0, Rev. 1.1, "Determination of Chlorine Dioxide and Chlorite Ion in Drinking Water Using Lissamine Green B and Horseradish Peroxidase with Detection by Visible Spectrophotometry," USEPA May 2005, EPA 815-R-05-008. Available online at http;/www.epa.gov/safewater/methods/sourcalt.html.

B. Sampling requirements for systems that do not provide filtration. A public water system that uses a surface water source and does not provide filtration treatment must begin sampling unless the Director has determined in writing that filtration is required pursuant to § 305 of the NNSDWA, 22 N.N.C. § 2535, in which case the Director may specify alternative sampling requirements, as appropriate, until filtration is in place. A water system that uses a groundwater source under the direct influence of surface water and does not provide filtration treatment must begin sampling 6 months after the Director determines that the groundwater source is under the direct influence of surface water, unless the Director has determined that filtration is required in writing pursuant to § 305 of the NNSDWA, 22 N.N.C. § 2535, in which case the Director may specify alternative sampling requirements, as appropriate, until filtration is in place.

1. Fecal coliform or total coliform density measurements as required by § 803 (A)(1) must be performed on representative source water samples immediately prior to the first or only point of disinfectant application. The system must sample for fecal or total coliforms at the following minimum frequency each week the system serves water to the public:

TABLE 800-D-3 SAMPLE FREQUENCY

SYSTEM SIZE (persons served)	SAMPLES/WEEK[1]
≤500	1
501 TO 3,300	2
3,301 TO 10,000	3
10,001 TO 25,000	4
>25,000	5

[1] Must be taken on separate days.

Also, one fecal or total coliform density measurement must be made every day the system serves water to the public and the turbidity of the source water exceeds 1 NTU (these samples count towards the weekly coliform sampling requirement) unless the Director determines that the system, for logistical reasons outside the system's control, cannot have the sample analyzed within 30 hours of collection.

2. Turbidity measurements as required by § 803 (A)(2) must be performed on representative grab samples of source water immediately prior to the first or only point of disinfectant application every four hours (or more frequently) that the system serves water to the public. A public water system may substitute continuous turbidity sampling for grab sample sampling if it validates the continuous measurement for accuracy on a regular basis using a protocol approved by the Director.

3. The total inactivation ratio for each day that the system is in operation must be determined based on the $CT_{99.9}$ values in Tables 800-D-4 through 800-D-11 of this section, as appropriate. The parameters necessary to determine the total inactivation ratio must be monitored as follows:

   a. The temperature of the disinfected water must be measured at least once per day at each residual disinfectant concentration sampling point.

   b. If the system uses chlorine, the pH of the disinfected water must be measured at least once per day at each chlorine residual disinfectant concentration sampling point.

   c. The disinfectant contact time(s) ("T") must be determined for each day during peak hourly flow.

   d. The residual disinfectant concentration(s) ("C") of the water before or at the first customer must be measured each day during peak hourly flow.

   e. If a system uses a disinfectant other than chlorine, the system may demonstrate to the Director, through the use of a Director-approved protocol for on-site

disinfection challenge studies or other information satisfactory to the Director, that $CT_{99.9}$ values other than those specified in Tables 800-D-10 and 800-D-11 in this section or other operational parameters are adequate to demonstrate that the system is achieving the minimum inactivation rates required by § 804 (A)(1).

TABLE 800-D-4 CT VALUES ($CT_{99.9}$) FOR 99.9 PERCENT INACTIVATION OF GIARDIA LAMBLIA CYSTS BY FREE CHLORINE AT 0.5°C OR LOWER[1]

Residual mg/L	pH						
	≤6.0	6.5	7.0	7.5	8.0	8.5	≤9.0
≤0.4	137	163	195	237	277	329	390
0.6	141	168	200	239	286	342	407
0.8	145	172	205	246	295	354	422
1.0	148	176	210	253	304	365	437
1.2	152	180	215	259	313	376	451
1.4	155	184	221	266	321	387	464
1.6	157	189	226	273	329	397	477
1.8	162	193	231	279	338	407	489
2.0	165	197	236	286	346	417	500
2.2	169	201	242	297	353	426	511
2.4	172	205	247	298	361	435	522
2.6	175	209	252	304	368	444	533
2.8	178	213	257	310	375	452	543
3.0	181	217	261	316	382	460	552

[1] These CT values achieve greater than a 99.99 % inactivation of viruses. CT values between the indicated pH values may be determined by linear interpolation. CT values between the indicated temperature of different tables may be determined by linear interpolation. If no interpolation is used, use the $CT_{99.9}$ value at the lower temperature and at the higher pH.

TABLE 800-D-5 CT VALUES ($CT_{99.9}$) FOR 99.9 PERCENT INACTIVATION OF GIARDIA LAMBLIA CYSTS BY FREE CHLORINE AT 5.0 °C[1]

Free Residual mg/L	pH						
	≤6.0	6.5	7.0	7.5	8.0	8.5	≤9.0
≤0.4	97	117	139	166	198	236	279
0.6	100	120	143	171	204	244	291
0.8	103	122	146	175	210	252	301
1.0	105	125	149	179	216	260	312
1.2	107	127	152	183	221	267	320
1.4	109	130	155	187	227	274	329
1.6	111	132	158	192	232	281	337
1.8	114	135	162	196	238	287	345
2.0	116	138	165	200	243	294	353
2.2	118	140	169	204	248	300	361

2.4	120	143	172	209	253	306	368
2.6	122	146	175	213	258	312	375
2.8	124	148	178	217	263	318	382
3.0	126	151	182	221	268	324	389

[1] These CT values achieve greater than a 99.99 % inactivation of viruses. CT values between the indicated pH values may be determined by linear interpolation. CT values between the indicated temperature of different tables may be determined by linear interpolation. If no interpolation is used, use the $CT_{99.9}$ value at the lower temperature, and at the higher pH.

TABLE 800-D-6 CT VALUES ($CT_{99.9}$) FOR 99.9 PERCENT INACTIVATION OF GIARDIA LAMBLIA CYSTS BY FREE CHLORINE AT 10.0 °C[1]

Free Residual mg/L	pH						
	≤6.0	6.5	7.0	7.5	8.0	8.5	≤9.0
≤0.4	73	88	104	125	149	177	209
0.6	75	90	107	128	153	183	218
0.8	78	92	110	131	158	189	226
1.0	79	94	112	134	162	195	234
1.2	80	95	114	137	166	200	240
1.4	82	98	116	140	170	206	247
1.6	83	99	119	144	174	211	253
1.8	86	101	122	147	179	215	259
2.0	87	104	124	150	182	221	265
2.2	89	105	127	153	186	225	271
2.4	90	107	129	157	190	230	276
2.6	92	110	131	160	194	234	281
2.8	93	111	134	163	197	239	287
3.0	95	113	137	166	201	243	292

[1] These CT values achieve greater than a 99.99 % inactivation of viruses. CT values between the indicated pH values may be determined by linear interpolation. CT values between the indicated temperatures of different tables may be determined by linear interpolation. If no interpolation is used, use the $CT_{99.9}$ value at the lower temperature, and at the higher pH.

TABLE 800-D-7 CT VALUES ($CT_{99.9}$) FOR 99.9 PERCENT INACTIVATION OF GIARDIA LAMBLIA CYSTS BY FREE CHLORINE AT 15.0 °C[1]

Free Residual mg/L	pH						
	≤6.0	6.5	7.0	7.5	8.0	8.5	≤9.0
≤0.4	49	59	70	83	99	118	140
0.6	50	60	72	86	102	122	146
0.8	52	61	73	88	105	126	151
1.0	53	63	75	90	108	130	156
1.2	54	64	76	92	111	134	160

1.4	55	65	78	94	114	137	165
1.6	56	66	79	96	116	141	169
1.8	57	68	81	98	119	144	173
2.0	58	69	83	100	122	147	177
2.2	59	70	85	102	124	150	181
2.4	60	72	86	105	127	153	184
2.6	61	73	88	107	129	156	188
2.8	62	74	89	109	132	159	191
3.0	63	76	91	111	134	162	195

[1] These CT values achieve greater than a 99.99 % inactivation of viruses. CT values between the indicated pH values may be determined by linear interpolation. CT values between the indicated temperatures of different tables may be determined by linear interpolation. If no interpolation is used, use the $CT_{99.9}$ value at the lower temperature, and at the higher pH.

TABLE 800-D-8 CT VALUES ($CT_{99.9}$) FOR 99.9 PERCENT INACTIVATION OF GIARDIA LAMBLIA CYSTS BY FREE CHLORINE AT 20.0°C[1]

Free Residual mg/L	pH						
	≤6.0	6.5	7.0	7.5	8.0	8.5	≤9.0
≤0.4	36	44	52	62	74	89	105
0.6	38	45	54	64	77	92	109
0.8	39	46	55	66	79	95	113
1.0	39	47	56	67	81	98	117
1.2	40	48	57	69	83	100	120
1.4	41	49	58	70	85	103	123
1.6	42	50	59	72	87	105	126
1.8	43	51	61	74	89	108	129
2.0	44	52	62	75	91	110	132
2.2	44	53	63	77	93	113	135
2.4	45	54	65	78	95	115	138
2.6	46	55	66	80	97	117	141
2.8	47	56	67	81	99	119	143
3.0	47	57	68	83	101	122	146

[1]These CT values achieve greater than a 99.99 % inactivation of viruses. CT values between the indicated pH values may be determined by linear interpolation. CT values between the indicated temperatures of different tables may be determined by linear interpolation. If no interpolation is used, use the $CT_{99.9}$ value at the lower temperature, and at the higher pH.

TABLE 800-D-9 CT VALUES ($CT_{99.9}$) FOR 99.9 PERCENT INACTIVATION OF GIARDIA LAMBLIA CYSTS BY FREE CHLORINE AT 25.0 °C[1] AND HIGHER

Free Residual mg/L	pH						
	≤6.0	6.5	7.0	7.5	8.0	8.5	≤9.0

≤0.4	24	29	35	42	50	59	70
0.6	25	30	36	43	51	61	73
0.8	26	31	37	44	53	63	75
1.0	26	31	37	45	54	65	78
1.2	27	32	38	46	55	67	80
1.4	27	33	39	47	57	69	82
1.6	28	33	40	48	58	70	84
1.8	29	34	41	49	60	72	86
2.0	29	35	41	50	61	74	88
2.2	30	35	42	51	62	75	90
2.4	30	36	43	52	63	77	92
2.6	31	37	44	53	65	78	94
2.8	31	37	45	54	66	80	96
3.0	32	38	46	55	67	81	97

[1] These CT values achieve greater than a 99.99 % inactivation of viruses. CT values between the indicated pH values may be determined by linear interpolation. CT values between the indicated temperatures of different tables may be determined by linear interpolation. If no interpolation is used, use the $CT_{99.9}$ value at the lower temperature, and at the higher pH.

TABLE 800-D-10 CT VALUES ($CT_{99.9}$) FOR 99.9 PERCENT INACTIVATION OF GIARDIA LAMBLIA CYSTS BY CHLORINE DIOXIDE AND OZONE[1]

Temperature	≤1°C	5 °C	10 °C	15 °C	20 °C	≥25 °C
Chlorine Dioxide	63	26	23	19	15	11
Ozone	2.9	1.9	1.4	0.95	0.72	0.48

[1] These CT values achieve greater than 99.99 % inactivation of viruses. CT values between the indicated temperatures may be determined by linear interpolation. If no interpolation is used, use the $CT_{99.9}$ value at the lower temperature for determining $CT_{99.9}$ values between indicated temperatures.

TABLE 800-D-11 CT VALUES ($CT_{99.9}$) FOR 99.9 PERCENT INACTIVATION OF GIARDIA LAMBLIA CYSTS BY CHLORAMINES[1]

Temperature					
≤1 °C	5 °C	10 °C	15 °C	20 °C	25 °C
3,800	2,200	1,850	1,500	1,100	750

[1] These values are for pH values of 6 to 9. These CT values may be assumed to achieve greater than 99.99 % inactivation of viruses only if chlorine is added and mixed in the water prior to the addition of ammonia. If this condition is not met, the system must demonstrate, based on on-site studies or other information, as approved by the Director, that the system is achieving at least 99.99 % inactivation of viruses. CT values between the indicated temperatures may be determined by linear interpolation. If no interpolation is used, use the $CT_{99.9}$ value at the lower temperature for determining $CT_{99.9}$ values between indicated temperatures.

4. The total inactivation ratio must be calculated as follows:

   a. If the system uses only one point of disinfectant application, the system may determine the total inactivation ratio based on either of the following two methods:

      1. One inactivation ratio ($CTcalc/CT_{99.9}$) is determined before or at the first customer during peak hourly flow and if the $CTcalc/CT_{99.9} \geq 1.0$, the 99.9 %

Giardia lamblia inactivation requirement has been achieved; or

2. Successive CTcalc/$CT_{99.9}$ values, representing sequential inactivation ratios, are determined between the point of disinfectant application and a point before or at the first customer during peak hourly flow. Under this alternative, the following method must be used to calculate the total inactivation ratio:

(1) Determine $\frac{CTcalc}{CT_{99.9}}$ for each sequence.

(2) Add the $\frac{CTcalc}{CT_{99.9}}$ values together $\left(\sum\frac{(CTcalc)}{CT_{99.9}}\right)$

(3) *If* $\sum\left(\frac{CTcalc}{CT_{99.9}}\right) \geq 1.0$, the 99.9 percent Giardia

Lamblia inactivation requirement has been achieved.

b. If the system uses more than one point of disinfectant application before or at the first customer, the system must determine the CT value of each disinfection sequence immediately prior to the next point of disinfectant application during peak hourly flow. The CTcalc/$CT_{99.9}$ value of each sequence and

$$\sum\frac{CTcalc}{CT_{99.9}}$$

must be calculated using the method in subsection (B)(4)(a)(2) of this section to determine if the system is in compliance with § 804 (A).

c. Although not required, the total percent inactivation for a system with one or more points of residual disinfectant concentration sampling may be calculated by solving the following equation:

$$\text{Percent inactivation} = 100 - \frac{100}{10^{z}}$$

$$\textit{where } z = 3 \times \sum\left(\frac{CTcalc}{CT_{99.9}}\right)$$

5. The residual disinfectant concentration of the water entering the distribution system must be monitored continuously, and the lowest value must be recorded each day, except that if there is a failure in the continuous sampling equipment, grab sampling every 4 hours may be conducted in lieu of continuous sampling, but for no more than 5 working days following the failure of the equipment, and systems serving 3,300 or fewer persons may take grab samples in lieu of providing continuous sampling on an ongoing basis at the frequencies prescribed below:

TABLE 800-D-12 SAMPLING INTERVALS

SYSTEM SIZE BY POPULATION	SAMPLES/DAY[1]
<500	1
501 to 1,000	2
1,001 to 2,500	3
2,501 to 3,300	4

[1]The day's samples cannot be taken at the same time. The sampling intervals are subject to the Director's review and approval.

If at any time the residual disinfectant concentration falls below 0.2 mg/l in a system using grab sampling in lieu of continuous sampling, the system must take a grab sample every 4 hours until the residual concentration is equal to or greater than 0.2 mg/l.

6. a. The residual disinfectant concentration must be measured at least at the same points in the distribution system and at the same time as total coliforms are sampled, as specified in § 404, except that the Director may allow a public water system which uses both a surface water source or a groundwater source under direct influence of surface water, and a groundwater source, to take disinfectant residual samples at points other than the total coliform sampling points if the Director determines that such points are more representative of treated (disinfected) water quality within the distribution system. Heterotrophic bacteria, measured as heterotrophic plate count (HPC) as specified in subsection (A)(1) of this section, may be measured in lieu of residual disinfectant concentration.

b. If the Director determines, based on site-specific considerations, that a system has no means for having a sample transported and analyzed for HPC by a certified laboratory under the requisite time and temperature conditions specified by subsection (A)(1) of this section and that the system is providing adequate disinfection in the distribution system, the requirements of subsection (B)(6)(a) of this section do not apply to that system.

C. Sampling requirements for systems using filtration treatment.

A public water system that uses a surface water source or a groundwater source under the influence of surface water and provides filtration treatment must monitor in accordance with this subsection (C) when filtration is installed.

1. Turbidity measurements as required by § 805 must be performed on representative samples of the system's filtered water every four hours (or more frequently) that the system serves water to the public. A water system may substitute continuous turbidity sampling for grab sampling if it validates the continuous measurement for accuracy on a regular basis using a protocol approved by the Director. For any systems using slow sand filtration or filtration treatment other than conventional treatment, direct filtration, or diatomaceous earth filtration, the Director may reduce the sampling frequency to once per day if it determines that less frequent sampling is sufficient to indicate effective filtration performance. For systems serving 500 or fewer persons, the Director may reduce the turbidity sampling frequency to once per day, regardless of the type of filtration treatment used, if the Director determines that less frequent sampling is sufficient to indicate effective filtration performance.

2. The residual disinfectant concentration of the water entering the distribution system must be monitored continuously, and the lowest value must be recorded each day, except that if there is a failure in the continuous sampling equipment, grab sampling every 4 hours may be conducted in lieu of continuous sampling, but for no more than 5 working days following the failure of the equipment, and systems serving 3,300 of fewer persons may take grab samples in lieu of providing continuous sampling on an ongoing basis at the frequencies each day prescribed below:

TABLE 800-D-13 SAMPLING FREQUENCIES

SYSTEM SIZE BY POPULATION	SAMPLES/DAY[1]
±500	1
501 to 1,000	2
1,001 to 2,500	3
2,501 to 3,300	4

[1] The day's samples cannot be taken at the same time. The sampling intervals are subject to the Director's

review and approval.

If at any time the residual disinfectant concentration falls below 0.2 mg/l in a system using grab sampling in lieu of continuous sampling, the system must take a grab sample every 4 hours until the residual disinfectant concentration is equal to or greater than 0.2 mg/l.

3. a. The residual disinfectant concentration must be measured at least at the same points in the distribution system and at the same time as total coliforms are sampled, as specified in § 404, except that the Director may allow a public water system which uses both a surface water source or a groundwater source under direct influence of surface water, and a groundwater source to take disinfectant residual samples at points other than the total coliform sampling points if the Director determines that such points are more representative of treated (disinfected) water quality within the distribution system. Heterotrophic bacteria, measured as heterotrophic plate count (HPC) as specified in subsection (A)(1) of this section, may be measured in lieu of residual disinfectant concentration.

b. If the Director determines, based on site-specific considerations, that a system has no means for having a sample transported and analyzed for HPC by a certified laboratory under the requisite time and temperature conditions specified by subsection (A)(1) of this section and that the system is providing adequate disinfection in the distribution system, the requirements of subsection (C)(3)(a) of this section do not apply to that system.

Addendum: Baffling Classification-*Guidance Manual for Compliance with the Filtration and Disinfection Requirements for Public Water Systems using Surface Water Sources, March, 1991 Edition, Science and Technology Branch Criteria and Standards Division, Office of Drinking Water, U.S. Environmental Protection Agency, Washington, D.C.*

TABLE 800-D-14 BAFFLING CLASSIFICATION

BAFFLING CONDITION	T_{10}/T	BAFFLING DESCRIPTION
Unbaffled (mixed flow)	0.1	None, agitated basin, very low length to width ratio, high inlet and outlet flow velocities.
Poor	0.3	Single or multiple unbaffled inlets and outlets, no intra-basin baffles.
Average	0.5	Baffled inlet or outlet with some intra-basin baffles.
Superior	0.7	Perforated inlet baffle, serpentine or perforated intra-basin baffles, outlet weir or perforated launders.
Perfect (plug flow)	1.0	Very high length to width ratio (pipeline flow), perforated inlet, outlet, and intra-basin baffles.

APPENDIX E
DISINFECTANT RESIDUALS, DISINFECTION BYPRODUCTS AND DISINFECTION BYPRODUCT PRECURSORS

1101-E ANALYTICAL REQUIREMENTS

A. General

1. Systems must use only the analytical method(s) specified in Part 1100 and Appendix E, or otherwise approved by EPA in the Federal Register, to demonstrate compliance with the requirements under Part 1100 or Appendix E. These methods are effective for compliance monitoring February 16, 1999, unless a different date is specified in this section or by this Director.

2. The following documents are incorporated by reference. Copies may be inspected at EPA's Drinking Water Docket, 1301 Constitutional Avenue, NW, EPA West, Room B102, Washington, DC, 20460, or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202-741-6030, or go to: http://www.archives.gov/federal_register/code_or_federal_regulations/ibr_locations.html. EPA Method 552.1 is in Methods for the Determination of Organic Compounds in Drinking Water-Supplement II, USEPA, August 1992, EPA/600/R-92/129 (available through National Information Technical Service (NTIS), PB92-207703). EPA Methods 502.2, 524.2, 551.1, and 552.2 are in Methods for the Determination of Organic Compounds in Drinking Water-Supplement III, USEPA, August 1995, EPA/600/R-95/131 (available through NTIS, PB95-261616). EPA Method 300.0 is in Methods for Determination of Inorganic Substances in Environmental Samples, USEPA, August 1993, EPA/600/R-93/100 (available through NTIS, PB94-121811). EPA Methods 300.1 and 321.8 are in Methods for the Determination of Organic and Inorganic Compounds in Drinking Water, Volume 1, USEPA, August 2000, EPA 815-R-00-014 (Available through NTIS, PB2000-106981). EPA Method 317.0, Revision 2.0, "Determination of Inorganic Oxyhalide Disinfection By-Products in Drinking Water Using Ion Chromatography with the Addition of a Postcolumn Reagent for Trace Bromate Analysis," USEPA, July 2001, EPA 815-B-01-001, EPA Method 326.0, Revision 1.0, "Determination of Inorganic Oxyhalide Disinfection By-Products in Drinking Water Using Ion Chromatography Incorporating the Addition of a Suppressor Acidified Postcolumn Reagent for Trace Bromate Analysis," USEPA, June 2002, EPA 815-R-03-007, EPA Method 327.0, Revision 1.1, "Determination of Chlorite Ion in Drinking Water Using Lissamine Green B and Horseradish Peroxidase with Detection by Visible Spectrophotometry," USEPA, May 2005, EPA 815-R-05-008 and EPA Method 552.3, Revision 1.0, "Determination of Haloacetic Acids and Dalapon in Drinking Water by Liquid-liquid Microextraction, Derivatization, and Gas Chromatography with Electron Capture Detection," USEPA, July 2003, EPA-815-B-03-002 can be accessed and downloaded directly on-line at http://www.epa/gov/safewater/methods/sourcalt.html. EPA Method 415.3, Revision 1.1, "Determination of Total Organic Carbon and Specific UV Absorbance at 254nm in Source Water and Drinking Water," USEPA, February 2005, EPA/600/R-05/055 can be accessed and downloaded directly online at www.epa.gov/nerlcwww/ordmeth.htm. Standard Methods 4500-Cl D, 4500-Cl E, 4500-Cl F, 4500-Cl G, 4500-Cl H, 4500-Cl I, 4500-ClO_2 D, 4500-ClO_2 E, 6251 B, and 5910 B shall be followed in accordance with Standard Methods for the Examination of Water and Wastewater, 19th or 20th Editions, American Public Health Association, 1995 and 1998, respectively. The cited methods published in either edition may be used. Standard Methods shall be followed in accordance with the Supplement to the 19th Edition of Standard methods for the Examination of Water and Wastewater, or the Standard Methods for the Examination of Water and Wastewater, 20th Edition, American Public Health Association, 1996 and 1998, respectively. The cited methods published in either edition may be used. Copies may be obtained from the American Public Health Association, 1015 Fifteenth Street, NW, Washington, DC, 20005. Standard Methods 4500-Cl D-00, 4500-Cl E-00, 4500-Cl F-00, 4500-Cl G-00, 4500-Cl H-00, 4500-Cl I-00, 4500-ClO_2 E-00, 6251 B-94, 5310 B-00, 5310 C-00, and 5310 D-00, and 5910 B-00 are available at http://www.standardmethods.org or at EPA's Water Docket. The year in which each method was approved by the Standard Methods Committee is designated by the last two digits in the method number. The methods listed are the only Online versions that are IBR-approved. ASTM Methods D 1253-86 and D1253-86 (Reapproved 1996) shall be followed in accordance with the Annual Book of ASTM Standards, Volume 11.01, American Society for Testing and Materials International, 1996 or any ASTM edition containing the IBR-approved version of the method may be used. ASTM Standards, Volume 11.01, American Society for Testing and Materials International, 2004 or any ASTM edition containing the IBR-approved version of the method may be used. ASTM Method D 6581-00 shall be followed in accordance with the Annual Book Of ASTM Standards, Volume 11.01, American Society for Testing and Materials International, 2001 or any ASTM edition containing the IBR-approved

version of the method may be used; copies may be obtained from the American Society for Testing and Materials International, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959

B. Disinfection byproducts

1. Systems must measure disinfection byproducts by the methods (as modified by the footnotes) listed in the following table **or one of the alternative methods listed in Appendix A to subpart C of 40 C.F.R. pt. 141**:

Table 1101-E-1 Approved Methods for Disinfection Byproduct Compliance Monitoring

Contaminant and methodology[1]	EPA method	Standard method[2]	SM Online[3]	ASTM method[4]
TTHM				
P&T/GC/EICD & PID	502.2[5]	.....	.....	
P&T/GC/MS	524.2	.....	.....	
LLE/GC/ECD	551.1	.....	.....	
HAA5				
LLE(diamenthane)/GC/ECD	.....	6251 B[6]	6251 B-94	
SPE(acidic methanol)/GC/ECD	552.1[6]	.....	.....	
LLE(acidic methanol)/GC/ECD	552.2, 552.3	.....	.....	
Bromate				
Ion chromatography	300.1	.....	.....	D 6581-00
Ion chromatography & post column reaction	317.0 Rev 2.0[7], 326.0[7]	.....	.....	
IC/ICP-MS	321.8[7,8]	.....	.....	
Chlorite				
Amperometric titration	.....	4500-ClO_2E[9]	4500-ClO_2 E-00[9]	
Spectrophotometry	327.0 Rev 1.1[9]	.....	.....	
Ion chromatography	300.0, 300.1, 317.0, Rev 2.0, 326.0	.....	.....	D 6581-00

[1] P&T = purge and trap; GC = gas chromatography; EICD = electrolytic conductivity detector; PID = photoionization detector; MS = mass spectrometer; LLE = liquid/liquid extraction; ECD = electron capture detector; SPE = solid phase extraction; ICP-MS = inductively coupled plasma/mass spectrometer.

[2] 19th and 20th editions of Standard Methods for the Examination of Water and Wastewater, 1995 and 1998, respectively, American Public Health Association; either of these editions may be used.

[3] The Standard Methods Online version that is approved is indicated by the last two digits in the method number which is the year of approval by the Standard Method Committee. Standard Methods Online are available at http://www.standardmethods.org.

[4] Annual Book of ASTM Standards, 2001or any year containing the cited version of the method, Vol 11.01.

[5] If TTHMs are the only analytes being measured in the sample, then a PID is not required.

[6] The samples must be extracted within 14 days of sample collection.

[7] Ion chromatography & post column reaction or IC/ICP-MS must be used for monitoring of bromate for purposes of demonstrating eligibility or reduced monitoring, as prescribed in § 1103(B)(3)(b).

[8] Samples must be preserved at the time of sampling with 50 mg ethylenediamine (EDA)/L of sample and must be analyzed within 28 days.

[9] Amperometric titration or spectrophotometry may be used for routine daily monitoring of chlorite at the entrance to the distribution system, as prescribed in §1103(B)(2)(a)(1). Ion chromatography must be used for routine monthly monitoring of chlorite and additional monitoring of chlorite in the distribution system, as prescribed in §1103(B)(2)(a)(2) and (B)(2)(b).

2. Analyses under this section for disinfection byproducts must be conducted by laboratories that have received certification by EPA or the Director, except as specified under paragraph(D)(3)of this section. To receive certification to conduct analyses for the DBP contaminants in §§ 207, and NNPDWR Parts XXII and XXIII or this part, the laboratory must:

   a. Analyze Performance Evaluation (PE) samples that are acceptable to EPA at least once during each consecutive 12 month period by each method for which the laboratory desires certification.

   b. Until March 31, 2007, in these analyses of PE samples, the laboratory must achieve quantitative results within the acceptance limit on a minimum of 80% of the analytes included in each PE sample. The acceptance limit is defined as the 95% confidence interval calculated around the mean of the PE study between a maximum and minimum acceptance limit of +/-50% and +/-15% of the study mean.

   c. Beginning April 1, 2007, the laboratory must achieve quantitative results on the PE sample analyses that are within the following acceptance limits:

Table 1101-E-2 - Acceptance limits for Disinfection Byproducts

DBP	Acceptance limits (percent of true value)	Comments
TTHM		
Chloroform	±20	Laboratory must meet all 4 individual THM acceptance limits in order to successfully pass a PE sample for TTHM.
Bromodichloromethane	±20	
Dibromochloromethane	±20	
Bromoform	±20	
HAA5		
Monochloroacetic Acid	±40	Laboratory must meet the acceptance limits for 4 out of 5 of the HAA5 compounds in order to successfully pass a PE sample of HAA5.
Dichloroacetic Acid	±40	
Trichloroacetic Acid	±40	
Monobromoacetic Acid	±40	
Dibromoacetic Acid	±40	
Chlorite	±30	
Bromate	±30	

   d. Beginning April 1, 2007, report quantitative data for concentrations at least as low as the ones listed in the following table for all DBP samples analyzed for

compliance with §§ 208, and NNPDWR Parts XXII and XXIII of this part:

Table 1103-E-3 Minimum Reporting Level for Disinfection Byproducts

DBP	Minimum reporting level (mg/L)[1]	Comments
TTHM[2]		
Chloroform	0.0010	
Bromodichloromethane	0.0010	
Dibromochloromethane	0.0010	
Bromoform	0.0010	
HAA5[2]		
Monochloroacetic Acid	0.0020	
Dichloroacetic Acid	0.0010	
Trichloroacetic Acid	0.0010	
Monobromoacetic Acid	0.0010	
Dibromoacetic Acid	0.0010	
Chlorite	0.020	Applicable to monitoring as prescribed in §1103 (B)(2)(a)(ii) and (B)(2)(b)
Bromate	0.0050 or 0.0010	Laboratories that use EPA Methods 317.0 Revision 2.0, 326.0, or 312.8 must meet a 0.0010mg/L MRL for bromate

[1] The calibration curve must encompass the regulatory minimum reporting level (MRL) concentrations lower than the regulatory MRL as long as the precision and accuracy criteria are met by analyzing an MRL check standard at the lowest reporting limit chosen by the laboratory. The laboratory must verify the accuracy of the calibration curve at the MRL concentration by analyzing an MRL check standard with a concentration less than or equal to 110% of the MRL with each batch of samples. The measured concentration for the MRL check standard must be ±50% of the expected value, if any field sample in the batch has a concentration less than 5 times the regulatory MRL. Method requirements to analyze higher concentration check standards and meet tighter acceptance criteria for them must be met in addition to the MRL check standard requirement.
[2] When adding the individual trihalomethane or haloacetic acid concentration to calculate the TTHM or HAA5 concentrations, respectively, a zero is used for any analytical results that is less than the MRL concentration for that DBP, unless otherwise specified by the Director.

3. A party approved by EPA or NNEPA must measure daily chlorite samples at the entrance to the distribution system.

C. Disinfectant residuals.

1. Systems must measure residual disinfectant concentrations for free chlorine, combined chlorine (chloramines), and chlorine dioxide by the methods listed in the following table **or one of the alternative methods listed in Appendix A to subpart C of 40 C.F.R. pt. 141**:

Table 1101-E-4 Approved Methods for Disinfectant Residual Compliance Monitoring

Methodology	Standard Method (19^{th} or 20^{th} ED)	SM Online[1]	ASTM method	EPA method	Residual Measured[2]			
					Free Chlorine	Combined Chlorine	Total Chlorine	Chlorine dioxide

Amperometric Titration	4500-C D	4500-C D-00	D 1253-86 (96), 03		X	X	X	
Low Level Amperometric Titration	4500-C E	4500-C E-00					X	
DPD Ferrous Titrimetric	4500-C F	4500-C F-00			X	X	X	
DPD Colorimetric	4500-C G	4500-C G-00			X	X	X	
Syringaldazine (FACTS)	4500-C H	4500-C H-00			X			
Iodometric Electrode	4500-C I	4500-C I-00					X	
DPD	4500-C O_2 D							X
Amperometric Method II	4500 C O_2 E	4500-C O_2 E-00						X
Lissamine Green Spectrophotometric.				327.0 Rev				X

[1] The standard Methods Online version that is approved is indicated by the last two digits in the method number which is the year of approval by the Standard Method Committee. Standard Methods Online are available at http://www.standardmethods.org.

[2] X indicates method is approved for measuring specified disinfectant residual. Free chlorine or total chlorine may be measured for demonstrating compliance with the chlorine MRDL and combined chlorine, or total chlorine may be measured for demonstrating compliance with the chloramine MRDL.

2. If approved by the NNEPA, systems may also measure residual disinfectant concentrations for chlorine, chloramines, and chlorine dioxide by using DPD colorimetric test kits.

3. A party approved by EPA or NNEPA must measure residual disinfectant concentration.

D. Additional analytical methods. Systems required to analyze parameters not included in paragraphs (B) and (C) of this section must use the following methods **or one of the alternative methods listed in Appendix A to subpart C of 40 C.F.R. pt. 141.** A party approved by EPA or NNEPA must measure these parameters.

1. Alkalinity. All methods allowed in Appendix C § 701-C (A) for measuring alkalinity.

2. Bromide. EPA Method 300.0, 300.1, 317.0 Revision 2.0, 326.0, or ASTM D 6581-00.

3. Total Organic Carbon (TOC). Standard Method 5310 B or 5310 B-00 (High-Temperature Combustion Method) or Standard Method 5310 C or 5210 C-00 (Persulfate-Ultraviolet or Heated-Persulfate Oxidation Method) or Standard Method 5310 D or 5310 D-00 (Wet-Oxidation Method) or EPA Method 415.3 Revision 1.1. Inorganic carbon must be removed from the samples prior to analyses. TOC samples may not be filtered prior to analysis. TOC samples must be acidified at the time of sample collection to achieve pH less than or equal to 2 with minimal addition of the acid specified in the method or by the instrument manufacturer. Acidified TOC samples must be analyzed within 28 days.

4. Specific Ultraviolet Absorbance (SUVA). SUVA is equal to the UV absorption at 254nm (UV_{254}) (measured in m^{-1} divided by the dissolved organic carbon (DOC) concentration (measured as mg/L). In order to determine SUVA, it is necessary to separately measure UV_{254} and DOC. When determining SUVA, systems must use the methods stipulated in paragraph (D)(4)(i) of this

section to measure DOC and the method stipulated in paragraph (D)(4)(ii) of this section to measure (UV_{254}). SUVA must be determined on water prior to the addition of disinfectants/oxidants by the system. DOC and (UV_{254}) samples used to determine a SUVA value must be taken at the same time and at the same location.

a. Dissolved Organic Carbon (DOC). Standard Method 5310 B or 5310 B-00(High- Temperature Combustion Method) or Standard Method 5310 C or 5310 C-00(Persulfate- Ultraviolet or Heated-Persulfate Oxidation Method) or Standard Method 5310 D or 5310 D-00(Wet-Oxidation Method) or EPA method 415.3 Revision 1.1. DOC samples must be filtered through the 0.45 μm pore diameter filter as soon as practical after sampling, not to exceed 48 hours. After filtration, DOC samples must be acidified to achieve pH less than or equal to 2 with minimal addition of the acid specified in the method or by the instrument manufacturer. Acidified DOC samples must be analyzed within 28 days of sample collection. Inorganic carbon must be removed from the samples prior to analysis. Water passed through the filter prior to filtration of the sample must serve as the filtered blank. This filtered blank must be analyzed using procedures identical to those used for analysis of the samples and must meet the following criteria: DOC <0.5mg/L.

b. Ultraviolet Absorption at 254 nm (UV_{254}). Method 5910 B or 5910 B-00 (Ultraviolet Absorption Method) or EPA Method 415.3 Revision 1.1. UV absorption must be measured at 253.7 nm (may be rounded off to 254 nm). Prior to analysis, UV_{254} samples must be filtered through a 0.45 μm pore-diameter filter. The pH of UV_{254} samples may not be adjusted. Samples must be analyzed as soon as practical after sampling, not to exceed 48 hours.

5. pH. All methods allowed in Appendix A § 403-A (A) for measuring pH.

6. Magnesium. All methods allowed in Appendix A-403-A (A)(1.)

APPENDIX G
ENHANCED TREATMENT FOR *CRYPTOSPORIDIUM*

2401-G

A. ANALYTICAL METHODS

1. CRYPTOSPORIDIUM Systems must analyze for Cryptosporidium using Method 1623: *Cryptosporidium and Giardia in Water by Filtration/IMS/FA, 2005*, United States Environmental Protection Agency, EPA-815-R-05-002 or *Method 1622: Cryptosporidium in Water by Filtration/IMS/FA, 2005*, United States Environmental Protection Agency, EPA-815-R-05-001, which are incorporated by reference**, or alternative methods listed in Appendix A to subpart C of 40 C.F.R. pt. 141.** You may obtain a copy of these methods online from *http://www.epa.gov/safewater/disinfection/lt2* or from the United States Environmental Protection Agency, Office of Ground Water and Drinking Water, 1201 Constitution Ave., NW, Washington, DC 20460 (Telephone: 800-426-4791). You may inspect a copy at the Water Docket in the EPA Docket Center, 1301 Constitution Ave., NW, Washington, DC, (Telephone: 202-566-2426) or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202-741-6030, or go to: http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html.

   a. Systems must analyze at least a 10 L sample or a packed pellet volume of at least 2 mL as generated by the methods listed in paragraph (A) of this section. Systems unable to process a 10 L sample must analyze as much sample volume as can be filtered by two filters approved by EPA for the methods listed in paragraph (A) of this section, up to a packed pellet volume of at least 2 mL.

   b.
      1. Matrix spike (MS) samples, as required by the methods in paragraph (A) of this section, must be spiked and filtered by a laboratory approved for Cryptosporidium analysis under § 2406.

      2. If the volume of the MS sample is greater than 10 L, the system may filter all but 10 L of the MS sample in the field, and ship the filtered sample and the remaining 10 L of source water to the laboratory. In this case, the laboratory must spike the remaining 10 L of water and filter it through the filter used to collect the balance of the sample in the field.

   c. Flow cytometer-counted spiking suspensions must be used for MS samples and ongoing precision and recovery (OPR) samples.

2. **E. COLI.** Systems must use methods for enumeration of E. coli in source water approved in 40 CFR §136.3(a) ~~of this~~ **or alternative methods listed in Appendix A to subpart C of 40 C.F.R. pt. 141**.~~title.~~

   a. The time from sample collection to initiation of analysis may not exceed 30 hours unless the system meets the condition of paragraph (B)(2) of this section.

   b. The Director may approve on a case-by-case basis the holding of an E. coli sample for up to 48 hours between sample collection and initiation of analysis if the Director determines that analyzing an E. coli sample within 30 hours is not feasible. E. coli samples held between 30 to 48 hours must be analyzed by the Colilert reagent version of Standard Method 9223B as listed in 40 CFR §136.3(a) of this title.

3. Systems must maintain samples between 0°C and 10°C during storage and transit to the laboratory.

4. **TURBIDITY.** Systems must use methods for turbidity measurement approved in Appendix D § 801(D)(A)(1).

2402-G

A. **Approved laboratories.**

1. Cryptosporidium. Systems must have Cryptosporidium samples analyzed by a laboratory that is approved under EPA's Laboratory Quality Assurance Evaluation Program for Analysis of Cryptosporidium in Water or a laboratory that has been certified for Cryptosporidium

analysis by an equivalent State laboratory certification program.

2. E. coli. Any laboratory certified by the EPA, the National Environmental Laboratory Accreditation Conference or the State for total coliform or fecal coliform analysis under Appendix D § 801-D(A) is approved for E. coli analysis under this subpart when the laboratory uses the same technique for E. coli that the laboratory uses for Appendix D § 801-D(A).

3. Turbidity. Measurements of turbidity must be made by a party approved by the Director.

2403 - G

A. **E. coli sample analysis.**

1. The analysis of E. coli samples must meet the analytical method and approved laboratory requirements of Appendix G §§ 2401 and 2402.

2404 -G

A. **Cryptosporidium sample analysis.** The analysis of Cryptosporidium samples must meet the criteria in this paragraph.

1. Laboratories analyzed Cryptosporidium samples using one of the analytical methods in paragraphs (1)(a) through (f) of this subsection, which are incorporated by reference. You may obtain a copy of these methods on-line from the United States Environmental Protection Agency, Office of Ground Water and Drinking Water, 1201 Constitution Ave, NW, Washington, DC 20460 (Telephone: 800-426-4791). You may inspect a copy at the Water Docket in the EPA Docket Center, 1301 Constitution Ave., NW, Washington, DC, (Telephone: 202-566-2426) or at the National Archives and Records Administration (NARA). For information on the availability of this material, call 202-741-6030, or go to: http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html.

a. *Method 1623: Cryptosporidium and Giardia in Water by Filtration/IMS/FA, 2005*, United States Environmental Protection Agency, EPA-815-R-05-002.

b. *Method 1622: Cryptosporidium in Water by Filtration/IMS/FA, 2005*, United States Environmental Protection Agency, EPA-815-R-05-001.

c. *Method 1623: Cryptosporidium and Giardia in Water by Filtration/IMS/FA, 2001*, United States Environmental Protection Agency, EPA-821-R-01-025.

d. *Method 1622: Cryptosporidium in Water by Filtration/IMS/FA, 2001*, United States Environmental Protection Agency, EPA-821-R-01-026.

e. *Method 1623: Cryptosporidium and Giardia in Water by Filtration/IMS/FA, 1999*, United States Environmental Protection Agency, EPA-821-R-99-006.

f. *Method 1622: Cryptosporidium in Water by Filtration/IMS/FA, 1999*, United States Environmental Protection Agency, EPA-821-R-99-001.

2. For each Cryptosporidium sample, the laboratory analyzed at least 10 L of sample or at least 2 mL of packed pellet or as much volume as could be filtered by 2 filters that EPA approved for the methods listed in subsection(A)(1) of this section.

APPENDIX H
GROUNDWATER ANALYTICAL METHODS

2501-A GROUNDWATER SOURCE MICROBIAL MONITORING AND ANALYTICAL METHODS

A. A groundwater system subject to the source water monitoring requirements of § 2503(a) must collect a standard sample volume of at least 100 mL for fecal indicator analysis regardless of the fecal indicator or analytical method used.

B. A groundwater system must analyze all ground water source samples collected under §2503(a) using one of the analytical methods listed in the following table, or one of the alternative methods listed in Appendix A to subpart C of 40 C.F.R. pt. 141, for the presence of E. coli, enterococci, or coliphage:

Table 2501-A-1 ANALYTICAL METHODS FOR SOURCE WATER MONITORING

Fecal Indicator[1]	Methodology	Method Citation
E.coli	Colilert[2] Colisure[2] Membrane Filter Method with MI Agar m-ColiBlue24 Test [5] E*Colite Test[6] EC-MUG[7] NA-MUG[7]	9223B.[3] 9223B.[3] EPA Method 1604.[4] 9221F.[3] 9222G.[3]
Enterococci	Multiple-Tube Technique Membrane Filter Technique Membrane Filter Technique Enterolert[9]	9230B.[3] 9203C.[3] EPA Method 1600.[8]
Coliphage	Two-Step Enrichment Presence-Absence Procedure Single Agar Layer Procedure	EPA Method 1601.[10] EPA Method 1602.[11]

Analyses must be conducted in accordance with the documents listed below. Copies of the documents may be obtained from the sources listed below. Copies may be inspected in EPA's Drinking Water Docket, EPA West, 1301 Constitution Avenue, NW., EPA West, Room B102, Washington DC 20460 (Telephone: 202-566-2426); or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202-741-6030, or go to:
http://www.archives.gov/federal register/code of federal regulations/ibr locations.html.

[1] The time from sample collection to initiation of analysis may not exceed 30 hours. The ground water system is encouraged but is not required to hold samples below 10°C during transit.
[2] Medium is available through IDEXX Laboratories, Inc., One IDEXX Drive, Westbrook, Maine 04092.
[3] Methods are described in Standard Methods for the Examination of Water and Wastewater 20th edition (1998) and copies may be obtained from the American Public Health Association, 1015 Fifteenth Street, NW., Washington, DC, 20005-2605.
[4] EPA Method 1604: Total Coliforms and Escherichia coli in Water by Membrane Filtration Using a Simultaneous Detection Technique (MI Medium); September 2002, EPA 821-R-02-024. Method is available at http://www.epa.gov/nerlcwww/1604sp02.pdf or EPA's Water Resource Center (RC-4100T), 1200 Pennsylvania Avenue, NW., Washington, DC 20460.
[5] A description of the mColiBlue24 Test, "Total Coliforms and E.coli Membrane Filtration Method with m-ColiBlue24® Broth," Method No. 10029 Revision 2, August 17, 1999, is available from Hach Company, 100 Dayton Ave., Ames, IA 50010 or from EPA's Water Resource Center (RC-4100T), 1200 Pennsylvania Avenue, NW., Washington, DC 20460.
[6] A description of the E*Colite Test, "Charm E*Colite Presence/Absence Test for Detection and Identification of Coliform Bacteria and Escherichia coli in Drinking Water, January 9, 1998, is available from Charm Sciences, Inc., 659 Andover St., Lawrence, MA 01843-1032 or from EPA's Water Resource Center (RC-4100T), 1200 Pennsylvania Avenue, NW., Washington, DC 20460.
[7] EC-MUG(Method 9221F) or NA-MUG (9222G) can be used for E.coli testing step as described in §141.21(F)(6)(i) or (ii) after use of Standard Methods 9221 B, 9222 B, or 9222 C.

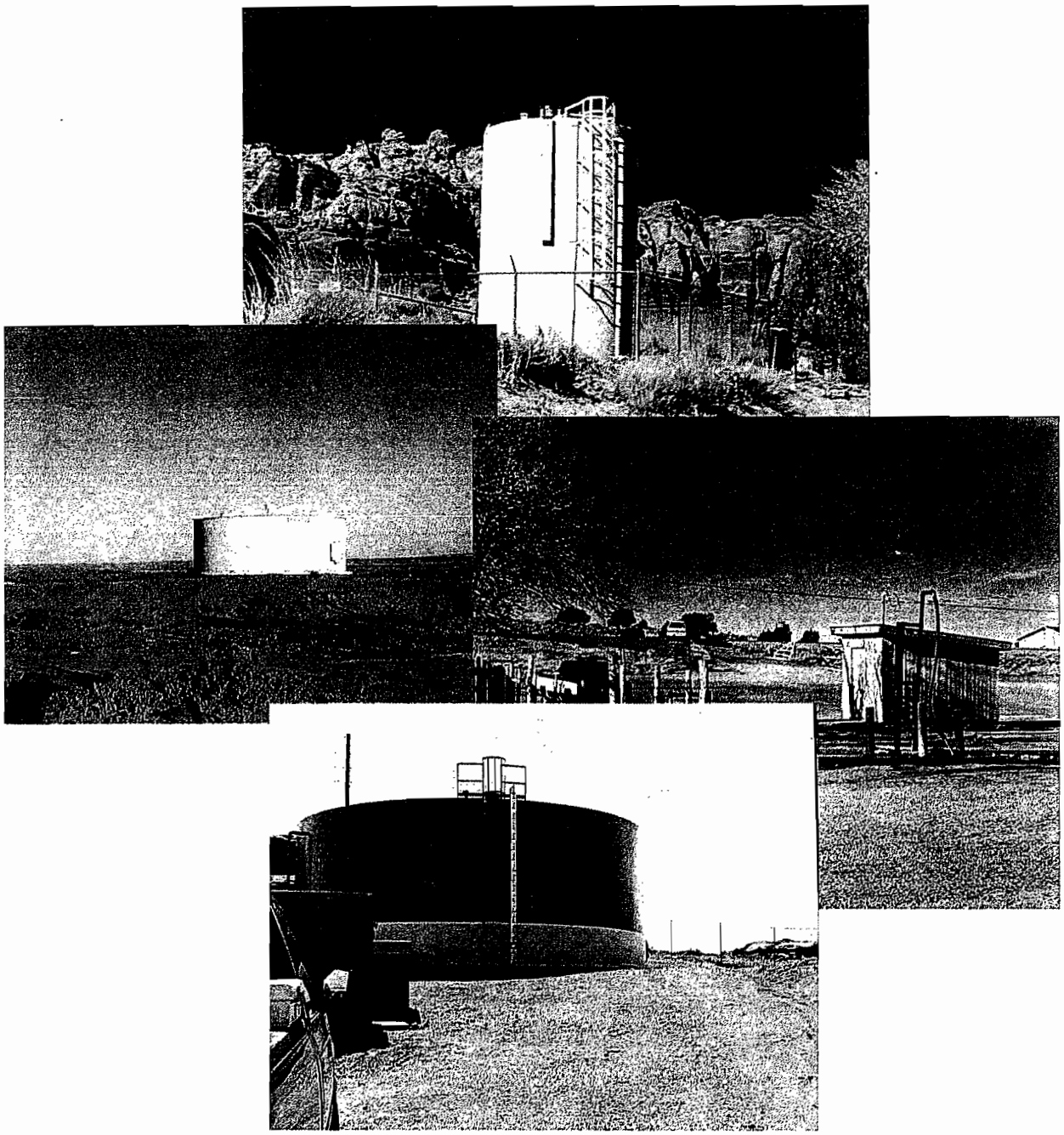
[8] Medium is available through IDEXX Laboratories, Inc., One IDEXX Drive, Westbrook, Maine 04092. Preparation and use of the medium is set forth in the article "Evaluation of Enterolert for Enumeration of Enterococci in Recreational Waters," by Budnick, G.E., Howard, R.T., and Mayo, D.R., 1996, Applied and Environmental Microbiology, 62:3881-3884.

[9] EPA Method 1600: Enterococci in Water by Membrane Filtration Using membrane-Enterococcus Indoxyl-β-D-Glucoside Agar (mEI) EPA 821-R-02-022 (September 2002) is an approved variation of Standard Method 9230C. The method is available at http://www.epa.gov/nerlcwww/1600so02.pdf or from EPA's Water Resource Center (RC-4100T), 1200 Pennsylvania Avenue, NW., Washington, DC 20460. The holding time and temperature for ground water samples are specified in footnote 1 above, rather than as specified in Section 8 of EPA Method 1600.

[10] EPA Method 1601: Male-specific (F+) and Somatic Coliphage in Water by Two-step Enrichment Procedure; April 2001, EPA 821-R-01-030. Method is available at http://www.epa.gov/nerlcwww/1601ap01.pdf or from EPA's Water Resource Center (RC-4100T), 1200 Pennsylvania Avenue, NW., Washington, DC 20460.

[11] EPA Method 1602: Male-specific (+) and Somatic Coliphage in Water by Single Agar Layer (SAL) Procedure; April 2001, EPA 821-R-01-029. Method is available at http://www.epa.gov/nerlcwww/1601ap01.pdf or from EPA's Water Resource Center (RC-4100T), 1200 Pennsylvania Avenue, NW., Washington, DC 20460.

NAVAJO NATION
PRIMARY DRINKING WATER REGULATIONS



Public Water Systems Supervision Program
Navajo Nation Environmental Protection Agency
Post Office Box 339
Window Rock, Arizona 86515
928-871-7755

RCJY-48-10

RESOLUTION
OF THE RESOURCES COMMITTEE
OF THE NAVAJO NATION COUNCIL

21st NAVAJO NATION COUNCIL - Fourth Year, 2010

AN ACTION

RELATING TO RESOURCES; AMENDING THE NAVAJO NATION PRIMARY DRINKING WATER REGULATIONS

BE IT ENACTED:

The Navajo Nation hereby amends the Navajo Nation Primary Drinking Water Regulations as set forth in Exhibit "A".

CERTIFICATION

I hereby certify that the foregoing resolution was duly considered by the Resources Committee of the Navajo Nation Council at a duly called meeting at Window Rock, Navajo Nation (Arizona), at which a quorum was present and that same was passed by a vote of 4 in favor and 0 opposed, this 8th day of July, 2010.

George Arthur, Chairperson
Resources Committee

Motion: Harriett K. Becenti
Second: Norman John, II

NAVAJO NATION
PRIMARY DRINKING WATER REGULATIONS
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§ 101 TITLE

These regulations may be cited as the Navajo Nation Primary Drinking Water Regulations (NNPDWR).

§ 102 AUTHORITY

These regulations are adopted pursuant to the Navajo Nation Safe Drinking Water Act (NNSDWA), 22 N.N.C. § 2501 et.seq.; they establish primary drinking water regulations and related regulations applicable to as amended public water systems pursuant to §§ 1401, 1412-13, 1417, 1445 and 1451 of the Public Health Service Act, as amended by the Safe Drinking Water Act, 42 U.S.C. §§ 300f, 300g-1, 300g-2, 300g-3, 300g-4, 300g- 5, 300g-6, 300j-4, 300j-9, and 300j-11.

§ 103 PURPOSE

The purpose of these regulations is to promote the protection of the health and welfare of the Navajo people and the environment by establishing appropriate water quality standards to ensure that drinking water is safe for consumption. No person shall control, manage or operate a public water system unless the system is maintained in compliance with the NNSDWA and these regulations. All public water system owners/operators must demonstrate technical, managerial and financial capability by complying with the NNSDWA and these regulations.

These regulations may be used as cleanup standard criteria for all groundwater remediation activities. Maximum Contaminant Levels defined in Part II of these regulations may be used as the aquifer water quality standards for aquifers within the Navajo Nation. Compliance with the MCL shall be from the analysis of a total (non-filtered) water sample (unless otherwise indicated in this document).

§ 104 DEFINITIONS

ACTION LEVEL - the concentration, specified in § 702(A), of lead or copper in water which determines, in some cases, the treatment requirements that a water system is required to complete as specified in Part VII (Lead and Copper Requirements) of these regulations.

ADMINISTRATOR - the Administrator of the United States Environmental Protection Agency.

AIR-GAP SEPARATION - a physical separation between the free flowing discharge end of a potable water supply pipeline and an open or non-pressurized receiving vessel.

AIR RELEASE VALVE - a valve that is placed at a high point of a pipeline for the automatic release of air to prevent air binding and the buildup of pressure.

AQUIFER - a geologic formation, group of formations, or part of a formation that contains sufficient saturated permeable material to yield significant quantities of water to wells and springs.

ALLUVIAL DEPOSITS - strata which were laid down by water, commonly consisting of gravels, sands, and silts, which usually have a high capacity for conducting groundwater.

ANSI - American National Standards Institute.

API - American Petroleum Institute.

ASTM - American Society for Testing and Materials or ASTM International.

AUXILIARY WATER SUPPLY - any source of water other than the designated source of public water system that is either used, or equipped to be used, as a water supply and located on, or piped to, the premises of a water user. (The term "equipped" in this definition means that appurtenances such as inactive wells, pumps, power supply, intakes, suction lines, pipelines, connecting fittings, or storage tanks are in place and readily available for use.)

AVAILABLE – The system's certified operator must be on site or able to be contacted as needed to initiate the appropriate action in a timely manner.

AWWA - American Water Works Association.

BACKFLOW - a reverse flow condition that causes water or mixtures of water and other liquids, gases, or substances to flow back into the distribution pipes or storage tanks of the drinking water supply

from any source other than the intended source. It can be created by a difference in water pressure (backpressure) caused by a vacuum or partial vacuum (backsiphonage), or a combination of both.
BACKFLOW-PREVENTION ASSEMBLY - any assembly used to prevent backflow from entering a drinking water system.

BAG FILTER - a pressure-driven separation device that removes particulate matter larger than 1 micrometer using an engineered porous filtration media. It is typically constructed of a non-rigid, fabric filtration media housed in a pressure vessel in which the direction of flow is from the inside of the bag to the outside.

BANK FILTRATION - a water treatment process that uses a well to recover surface water that has naturally infiltrated into ground water through a river bed or bank(s). Infiltration is typically enhanced by the hydraulic gradient imposed by a nearby pumping water supply or other well(s).

BEST AVAILABLE TECHNOLOGY or BAT - the best technology, treatment techniques, or other means which the Administrator finds, after examination for efficacy under field conditions and not solely under laboratory conditions, are available (taking cost into consideration). For the purposes of setting MCLs for synthetic organic chemicals, any BAT must be at least as effective as granular activated carbon.

BOARD - a group of individuals who are nominated by the Director to serve a term of three years. The Board will make recommendations and provide technical advice as needed.

BOOSTER PUMP - any pump installed within a water distribution system for the purpose of increasing the water pressure in the water distribution system, including distribution storage facilities downstream from the pump.

BOTTLED WATER SYSTEM - water system which manufactures bottled drinking water in the Navajo Nation.

BUSINESS PLAN - for the purpose of these regulations, a document consisting of three sub-plans, a "Facilities Plan", a "Management Plan", and a "Financing Plan" which is intended to show how a water system will be self-sustaining and have the commitment and the financial, managerial and technical capability to consistently comply with the Navajo Nation Safe Drinking Water Act and these Regulations.

CARTRIDGE FILTER - a pressure-driven separation device that removes particulate matter larger than 1 micrometer using an engineered porous filtration media. It is typically constructed as a rigid or semi-rigid, self-supporting filter element housed in a pressure vessel in which flow is from the outside of the cartridge to the inside.

CERTIFIED OPERATOR - a person who is certified by the Director as being qualified to operate a public water system.

COAGULATION - a process using coagulant chemicals and mixing by which colloidal and suspended materials are destabilized and agglomerated into flocs.

COMBINED DISTRIBUTION SYSTEM - the interconnected distribution system consisting of the distribution systems of wholesale systems and of the consecutive systems that receive finished water.

COMPREHENSIVE PERFORMANCE EVALUATION (CPE) - a thorough review and analysis of a treatment plant's performance-based capabilities and associated administrative, operation and maintenance practices. It is conducted to identify factors that may be adversely impacting a plant's capability to achieve compliance and emphasizes approaches that can be implemented without significant capital improvements. For purposes of compliance with Part 1100 and 2100, the comprehensive performance evaluation must consist of at least the following components: assessment of plant performance; evaluation of major unit processes; identification and prioritization of performance limiting factors; assessment of the applicability of comprehensive technical assistance; and preparation of CPE report.

COMMUNITY WATER SYSTEM - a public water system which serves at least 15 service connections used by year-round residents or regularly serves at least 25 year-round residents.

COMPLIANCE CYCLE - the nine calendar year cycle during which public water system must monitor. Each compliance cycle consists of three three-year compliance periods. The first cycle begins January 1, 1993 and ends December 31, 2001; the second begins January 1, 2002 and ends December 31, 2010; the third begins January 1, 2011 and ends December 31, 2019, and so on.

COMPLIANCE PERIOD - a three calendar year period within a compliance cycle. Each compliance cycle has three three-year compliance periods. Within the first compliance cycle, the first calendar period runs from January 1, 1993 to December 31, 1995; the second from January 1, 1996 to December 31, 1998; the third from January 1, 1999 to December 31, 2001, and so on.

CONFINED AQUIFER - an aquifer in which ground water is confined under pressure which is significantly greater than atmospheric pressure; and its upper limit is the bottom of a bed of distinctly lower hydraulic conductivity than that of the material in which the confined water occurs.

CONFLUENT GROWTH - a continuous bacterial growth covering the entire filtration area of a membrane filter, or a portion thereof, in which bacterial colonies are not discrete.

CONSECUTIVE SYSTEM - a public water system that receives some or all of its finished water from one or more wholesale systems. Delivery may be through a direct connection or through the distribution system of one or more consecutive systems.

CONTAMINANT - any physical, chemical, biological or radiological substance or matter in drinking water.

CONVENTIONAL FILTRATION TREATMENT - a series of processes including coagulation, flocculation, sedimentation, and filtration resulting in substantial particulate removal.

CORROSION INHIBITOR - a substance capable of reducing the corrosivity of water toward metal plumbing materials, especially lead and copper, by forming a protective film on the interior surface of those materials.

CT or CTcalc - the product of "residual disinfectant concentration" (C) in mg/l determined before or at the first customer, and the corresponding "disinfectant contact time" (T) in minutes, i.e., "C" x "T". If a public water system applies disinfectants at more than one point prior to the first customer, it must determine the CT of each disinfectant sequence before or at the first customer to determine the total percent inactivation or "total inactivation ratio." In determining the total inactivation ratio, the public water system must determine the residual disinfectant concentration of each disinfection sequence and corresponding contact time before any subsequent disinfection application point(s). "$CT_{99.9}$ " is the CT value required for 99.9% (3-log) inactivation of *Giardia lamblia* cysts. $CT_{99.9}$ for a variety of disinfectants and conditions appear in Tables 800 -D-4 to 800 -D-11 in Appendix D.

$$\frac{CTcalc}{CT_{99.9}}$$

is the inactivation ratio. The sum of the inactivation ratios, or total inactivation ratio shown as:

$$\sum \frac{(CTcalc)}{(CT_{99.9})}$$

is calculated by adding together the inactivation ratio for each disinfection sequence. A total inactivation ratio equal to or greater than 1.0 is assumed to provide a 3-log inactivation of *Giardia lamblia* cysts.

CROSS-CONNECTION - any unprotected actual or potential connection or structural arrangement between a public water system and any other source or distribution system containing liquid, gas or other substances not from an approved water supply.

DESIGN POPULATION - the estimated population to be served by the proposed facilities considering the population growth in the locality over the design life of the facilities.

DIATOMACEOUS EARTH FILTRATION - a process resulting in substantial particulate removal in which (1) a precoat cake of diatomaceous earth filter media is deposited on a support membrane (septum), and (2) while the water is filtered by passing through the cake on the septum, an additional filter media known as body feed is continuously added to the feed water to maintain the permeability of the filter cake.

DIRECT FILTRATION - a series of processes including coagulation and filtration but excluding sedimentation resulting in substantial particulate removal.

DIRECTOR - The Executive Director of the Navajo Nation Environmental Protection Agency (NNEPA) or his or her designee.

DISINFECTANT - any oxidant, including but not limited to chlorine, chlorine dioxide, chloramines, iodine and ozone, added to water in any part of the treatment or distribution process that is intended to kill or inactivate pathogenic microorganisms.

DISINFECTANT CONTACT TIME ("T" in CT calculations) - the time in minutes that it takes for water to move from the point of disinfectant application or the previous point of disinfectant residual measurement

to a point before or at the point where residual disinfectant concentration ("C") is measured. Where only one "C" is measured, "T" is the time in minutes that it takes for water to move from the point of disinfectant application to a point before or at where "C" is measured. Where more than one "C" is measured, "T" is (a) for the first measurement of "C", the time in minutes that it takes for water to move from the first or only point of disinfectant application to a point before or at the point where the first "C" is measured and (b) for subsequent measurements of "C", the time in minutes that it takes for water to move from the previous "C" measurement point to the "C" measurement point for which the particular "T" is being calculated. Disinfectant contact time in pipelines must be calculated based on "plug flow" by dividing the internal volume of the pipe by the maximum hourly flow rate through that pipe. Disinfectant contact time within mixing basins and storage reservoirs must be determined by tracer studies or an equivalent demonstration. See also Appendix D, Baffling Classifications, Table 800-D-14.

DISINFECTION - a process which inactivates pathogenic organisms in water by chemical oxidants or equivalent agents.

DISINFECTION PROFILE - a summary of daily Giardia lamblia inactivation through the treatment plant. The procedure for developing a disinfection profile is contained in §1304 (Disinfection profiling and benchmarking) and in Part 1100 and §§2104 (A) to (G) of Part 2100.

DISINFECTION/DISINFECTANT BYPRODUCTS SYSTEMS - public water systems using surface water or ground water under the direct influence of surface water as a source that are subject to the requirements of §1100.

DISTRIBUTION SYSTEM - any combination of pipes, tanks, pumps, etc. that delivers water from the source(s) and/or treatment facility(ies) to the consumer.

DISTRIBUTION SYSTEM COMPLEXITY - conditions or characteristics that exist in a distribution system, such as pressure zones, booster stations, storage tanks, fire protection, chlorination, non-residential consumers, cross connection potential, demand variations, size of pipes, total distance of pipes and/or total geographic area, that must be considered when classifying the distribution system.

DOMESTIC OR OTHER NONDISTRIBUTION SYSTEM PLUMBING PROBLEM - a coliform contamination problem in a public water system with more than one service connection that is limited to the specific service connection from which the coliform-positive sample was taken.

DOSE EQUIVALENT - the product of the absorbed dose from ionizing radiation and such factors as account for differences in biological effectiveness due to the type of radiation and its distribution in the body as specified by the International Commission on Radiological Units and Measurements (ICRU).

DOUBLE CHECK VALVE ASSEMBLY - two independently-acting, internally-loaded, check valves with shut-off valves located upstream and downstream of the two check valves, and test cocks to enable field testing.

DUAL SAMPLE SET - a set of two samples collected at the same time and same location, with one sample analyzed for TTHM and the other sample analyzed for HAA5. Dual sample sets are collected for the purposes of conducting an IDSE under Part XXII and determining compliance with the TTHM and HAA5 MCLs under Part XXIII.

EFFECTIVE CORROSION INHIBITOR RESIDUAL - for the purpose of Part VII (Lead and Copper Requirements) only, a concentration sufficient to form a passivating film on the interior walls of a pipe.

ENGINEER - the project engineer, who has obtained a "professional engineer" registration in the state of Arizona, New Mexico or Utah.

ENHANCED COAGULATION - the addition of sufficient coagulant for improved removal of disinfection byproduct precursors by conventional filtration treatment.

ENHANCED SOFTENING - the improved removal of disinfection byproduct precursors by precipitative softening.

EXEMPTION - a waiver granted from certain provisions of these regulations by the Director to a public water system pursuant to the NNSDWA and § 105 of these regulations.

EXISTING PUBLIC WATER SYSTEM - a public water system in operation on the effective date of these NNPDWR or, for purposes of compliance with a revised NNPDWR, on the effective date of the revision.

FILTER PROFILE - is a graphical representation of individual filter performance, based on continuous turbidity measurements or total particle counts versus time for an entire filter run, from startup to backwash inclusively, that includes an assessment of filter performance while another filter is being backwashed.

FILTRATION - a process for removing particulate matter from water by passage through porous media.

FINISHED WATER - water that is introduced into the distribution system of a public water system and is intended for distribution and consumption without further treatment, except treatment necessary to maintain water quality in the distribution system (e.g., booster disinfection, addition of corrosion control chemicals).

FIRST DRAW SAMPLE - a one-liter sample of tap water, collected in accordance with § 708 (B)(2), that has been standing in plumbing pipes at least 6 hours and is collected without flushing the tap.

FLOWING STREAM - a course of running water flowing in a definite channel.

FLOCCULATION - a process to enhance agglomeration or collection of smaller floc particles into larger, more easily settleable particles through gentle stirring by hydraulic or mechanical means.

GAC10 - granular activated carbon filter beds with an empty-bed contact time of 10 minutes based on average daily flow and a carbon reactivation frequency of every 180 days, except that the reactivation frequency for GAC10 used as a best available technology for compliance with Part XXIII MCLs under §207 (B)(2) shall be 120 days.

GAC20 - granular activated carbon filter beds with an empty-bed contact time of 20 minutes based on average daily flow and a carbon reactivation frequency of every 240 days.

GRANDPARENTING - the exemption for an existing operator in responsible charge from meeting the initial education and/or examination requirements for certification to operate a particular water system.

GRAY WATER - Untreated household waste water that has not come into contact with toilet waste. It includes used water from bathtubs, showers, bathroom wash basins, and water from clothes-washing machines and laundry tubs. It does not include waste water from kitchen sinks or dishwashers.

GROSS ALPHA PARTICLE ACTIVITY - the total radioactivity due to alpha particle emission as inferred from measurements on a dry sample.

GROSS BETA PARTICLE ACTIVITY - the total radioactivity due to beta particle emission as inferred from measurements on a dry sample.

GROUNDWATER - subsurface water found in void spaces in geologic materials within the zone of saturation.

GROUNDWATER SOURCE - a source of water captured underground. This term includes wells and springs.

GROUNDWATER SYSTEM - any public water system that use ground water except that it does not apply to public water systems that combine all of their ground water with surface water or with ground water under the direct influence of surface water prior to treatment under Part 700, including consecutive systems receiving finished ground water.

GROUNDWATER UNDER THE DIRECT INFLUENCE OF SURFACE WATER (GWUDI)- any water beneath the surface of the ground with significant occurrence of insects or other macroorganisms, algae, or large-diameter pathogens such as *Giardia lamblia*, *Cryptosporidium* significant and/or relatively rapid shifts in water characteristics such as turbidity, temperature, conductivity, or pH which closely correlate to climatological or surface water conditions. Direct influence must be determined for individual sources in accordance with criteria established by the NNEPA. The NNEPA determination of direct influence may be based on site-specific measurements of water quality and/or documentation of well construction characteristics and geology with field evaluation.

GROUT - a fluid mixture of cement and water (neat cement) of a consistency that can be forced through a pipe and placed as required. Various additives, such as sand, bentonite, and hydrated lime, may be included in the mixture to meet certain requirements. For example, sand is added when a considerable volume of grout is needed.

HALOACETIC ACIDS (five) (HAA5) - the sum of the concentrations in milligrams per liter of the haloacetic acid compounds (monochloroacetic acid, dichloroacetic acid, trichloroacetic acid, monobromoacetic acid, and dibromoacetic acid), rounded to two significant figures after addition.

HALOGEN - one of the chemical elements chlorine, bromine or iodine.

HETEROTROPHIC PLATE COUNT (HPC) or STANDARD PLATE COUNT - a procedure for estimating the number of live heterotrophic bacteria in water and measuring changes during water treatment and distribution.

HYDROPNEUMATIC TANK - a system comprised of an airtight tank, in which air is compressed over water, is used to impart pressure to the water in the tank and to attached pipelines for the distribution of the water.

INDIAN COUNTRY - Land as defined at 18 U.S.C. § 1151: "(a) all land within the limits of any Indian reservation under the jurisdiction of the United States Government, notwithstanding the issuance of any patent, and including rights-of-way running through the reservation, (b) all dependent Indian communities within the borders of the United States, whether within the original or subsequently acquired territory thereof, and whether within or without the limits of a state, and (c) all Indian allotments, the Indian titles to which have not been extinguished, including rights-of-way running through the same."

INDIAN TRIBE - any Indian Tribe having a Federally recognized governing body carrying out substantial governmental duties and powers over any area.

INITIAL COMPLIANCE PERIOD - the first full three-year compliance period which begins at least 18 months after promulgation of the federal regulations, except that for contaminants listed at § 204 (A)(1) Table 200.3 (19)-(21), § 205 (A)(2) Table 200.4 (19) - (33), and § 203 (A) Table 200.1 (1), (6), (10) and (18), initial compliance period means the first full three-year compliance period after promulgation for systems with 150 or more service connections (January 1993-December 1995), and first full three-year compliance period after the effective date of the federal regulations (January 1996-December 1998) for systems having fewer than 150 service connections.

INJECTION WELL - a well used to dispose of fluids underground. Fluids enter either by gravity flow or by injection under pressure.

ISOLATION VALVE - a valve, including a ball valve, butterfly valve, gate valve, or other type of valve, installed in a pipeline to shut off the flow of the water in a portion of the pipeline for the purpose of inspection or repair.

LAKE/RESERVOIR - a natural or man-made basin or hollow on the Earth's surface in which water collects or is stored and that may or may not have a current or single direction of flow.

LARGE WATER SYSTEM - for the purposes of Part VII (Lead and Copper Requirements), a water system that serves more than 50,000 persons.

LEAD FREE - for purposes of these regulations the term "lead free" 1) when used with respect to solders and flux, refers to those containing not more than 0.2 %; 2) when used with respect to pipes and pipe fittings, refers to those containing not more than 8.0 % lead; and 3)when used with respect to plumbing, fittings and fixtures intended by the manufacturer to dispense water for human ingestion, refers to those which comply with standards established in accordance with 42 U.S.C. 300g-6(e).

LEAD SERVICE LINE - a service line made of lead which connects the water main to the building inlet and any lead pigtail, gooseneck or other fitting which is connected to such lead line.

LEGIONELLA - a genus of bacteria, some species of which have caused a type of pneumonia called Legionnaires Disease.

LOCATIONAL RUNNING ANNUAL AVERAGE (LRAA)- the average of sample analytical results for samples taken at a particular monitoring location during the previous four calendar quarters.

LOG - in terms of removal or inactivation of *Giardia lamblia* cysts or viruses, "One-log" is 90 %; "Two-log" is 99 %; "Three-log" is 99.9 %; and "Four-log" is 99.99 %.

MAN-MADE BETA PARTICLE AND PHOTON EMITTERS - all radionuclides emitting beta particles or photons listed in "Maximum Permissible Body Burdens and Maximum Permissible Concentration of Radionuclides in Air or Water for Occupational Exposure", NBS Handbook 69, except the daughter products of thorium-232, uranium-235, and uranium-238.

MAXIMUM CONTAMINANT LEVEL (MCL) - the maximum permissible level of a contaminant in water which is delivered to any user of a public water system.

MAXIMUM CONTAMINANT LEVEL GOAL or MCLG - the maximum level of a contaminant in drinking water at which no known or anticipated adverse effect on the health or persons would occur, and which allows an adequate margin of safety. Maximum contaminant level goals are nonenforceable health goals.

MAXIMUM RESIDUAL DISINFECTANT LEVEL (MRDL) - a level of a disinfectant added for water treatment that may not be exceeded at the consumer's tap without an unacceptable possibility of adverse health effects.

For chlorine and chloramines, a PWS is in compliance with the MRDL when the running annual average of monthly averages of samples taken in the distribution system, computed quarterly, is less than or equal to the MRDL. For chlorine dioxide, a PWS is in compliance with the MRDL when daily samples are taken at the entrance to the distribution system and no two consecutive daily samples exceed the MRDL. MRDLs are enforceable in the same manner as maximum contaminant levels. There is convincing evidence that addition of a disinfectant is necessary for control of waterborne microbial contaminants. Notwithstanding the MRDLs listed in §208, operators may increase residual disinfectant levels of chlorine or chloramines (but not chlorine dioxide) in the distribution system to a level and for a time necessary to protect public health to address specific microbiological contamination problems caused by circumstances such as distribution line breaks, storm runoff events, source water contamination, or cross-connections.

MAXIMUM RESIDUAL DISINFECTANT LEVEL GOAL (MRDLG) - the maximum level of a disinfectant added for water treatment at which no known or anticipated adverse effect on the health of persons would occur, and which allows an adequate margin of safety. MRDLGs are nonenforceable health goals and do not reflect the benefit of the addition of the chemical for control of waterborne microbial contaminants.

MAXIMUM TOTAL TRIHALOMETHANE POTENTIAL (MTP) - the maximum concentration of total trihalomethanes produced in a given water containing a disinfectant residual after seven days at a temperature of 25°C or above.

MEDIUM SIZE WATER SYSTEM - for the purpose of Part VII (Lead and Copper Requirements), a water system that serves greater than 3,300 and fewer than or equal to 50,000 persons.

MEMBRANE FILTRATION - a pressure- or vacuum-driven separation process in which particulate matter larger than 1 micrometer is rejected by an engineered barrier, primarily through a size-exclusion mechanism, and that has a measurable removal efficiency of a target organism that can be verified through the application of a direct integrity test. This definition includes the common membrane technologies of microfiltration, ultrafiltration, nanofiltration, and reverse osmosis.

NAVAJO NATION - means:

a. all land within the exterior boundaries of the Navajo Indian Reservation or of the Eastern Navajo Agency or of Navajo dependent Indian communities, including all lands within the boundaries of Navajo chapter governments;

b. all land held in trust by the United States for or restricted by the United States or otherwise set aside or apart under the superintendence of the United States for the use or benefit of the Navajo Nation, the Navajo Tribe, any Band of Navajo Indians, or any individual Navajo Indians as such; and

c. all other land over which the Navajo Nation may exercise governmental jurisdiction in accordance with federal or international law.

NAVAJO NATION PRIMARY DRINKING WATER REGULATIONS (NNPDWR) - Requirements promulgated pursuant to the NNSDWA that 1) apply to public water systems, 2) specify contaminants which, in the judgment of the Director, may have an adverse effect on the health of persons, 3) specify for each contaminant either (a) a maximum contaminant level if, in the judgment of the Director, it is economically and technologically feasible to ascertain the level of contaminant in public water systems, or b) if, in the judgment of the Director, it is not economically or technologically feasible to so ascertain the level of contaminant, specify each treatment technique known to the Director which leads to a reduction in the level of contaminant sufficient to satisfy the requirements of § 1412 of the U.S. SDWA and subchapter 3 of the Navajo Nation Safe Drinking Water Act; and 4) contain criteria and procedures to assure a supply of drinking water which dependably complies with maximum contaminant levels, including quality control and testing procedures to ensure compliance with such levels and to ensure proper operation and maintenance of the public water system, and requirements as to the minimum quality of water which may be taken into the system and siting for new facilities for public water systems.

NAVAJO NATION SAFE DRINKING WATER ACT (NNSDWA) - the act which is codified at 22 Navajo Nation Code (NNC) §§ 2501-2586, as amended, that establishes the Navajo Nation's environmental law with regard to public water systems and their responsibility to provide safe drinking water to the residents of the Navajo Nation.

NAVAJO NATION SECONDARY DRINKING WATER STANDARDS (NNSDWS) - Standards promulgated pursuant to the NNSDWA that apply to public water systems and specify the maximum contaminant levels which, in the judgment of the Director, are requisite to protect the public welfare primarily with regard to aesthetic qualities. Such standards may apply to any contaminant in drinking water (a) which may adversely affect the odor or appearance of water and, consequently, may cause a substantial number of persons served by the public water system to discontinue its use, or (b) which may otherwise adversely affect the public welfare. Such standards may vary according to geographic and other circumstances.

NEAR THE FIRST SERVICE CONNECTION - means at one of the 20 % of all service connections in the entire system that are nearest the water supply treatment facility, as measured by water transport time within the distribution system.

NEW PUBLIC WATER SYSTEM - a public water system that begins operating after the effective date of these regulations.

NNEPA - means the Navajo Nation Environmental Protection Agency.

NON-COMMUNITY WATER SYSTEM - a public water system that is neither a "community water system" nor a "non-transient non-community water system", including but not limited to: seasonal facilities such as children's camps or recreational camping areas; and year-round facilities that serve more than 25 persons who are not residents thereof, such as gasoline service stations, marinas, rest areas and restaurants that are not served by a community water system.

NON-TRANSIENT NON-COMMUNITY WATER SYSTEM - a public water system that is not a "community water system" and that regularly serves at least 25 of the same persons for more than 6 months per year, including but not limited to schools, factories and public buildings.

NSF - NSF International, P.O. Box 130140, 789 N. Dixboro Road, Ann Arbor, MI 48113-0140, USA. Web: http:\\www.nsf.org

NTU - Nephelometric Turbidity Unit used to measure turbidity.

OPTIMAL CORROSION CONTROL TREATMENT - for the purpose of Part VII (Lead and Copper Requirements), the corrosion control treatment that minimizes the lead and copper concentrations at users' taps while insuring that the treatment does not cause the water system to violate any national primary drinking water regulations.

PERSON - an individual, corporation, company, association, partnership, municipality, local, state or federal government or agency or Indian tribe, tribal division, tribal department, tribal enterprise or tribal entity.

PICOCURIE (pCi) - that quantity of radioactive material producing 2.22 nuclear transformations per minute.

PLANT INTAKE - the works or structures at the head of a conduit through which water is diverted from a source (e.g., river or lake) into the treatment plant.

POINT OF DISINFECTANT APPLICATION - the point where the disinfectant is applied and water downstream of that point is not subject to recontamination by surface water runoff.

POINT OF ENTRY - the point where all systems (both unfiltered and filtered) would record the lowest disinfectant residue concentration entering the system each day.

POINT-OF-ENTRY TREATMENT DEVICE (POE) - a treatment device applied to the drinking water entering a house or building for the purpose of reducing contaminants in the drinking water distributed throughout the house or building.

POINT-OF-USE TREATMENT DEVICE (POU) - a treatment device applied to a single tap used for the purpose of reducing contaminants in drinking water at that one tap.

PREMISES - the property under the ownership or control of the water user and served, or capable of being served, with water via a service connection with the public water system.

PRESEDIMENTATION - a preliminary treatment process used to remove gravel, sand, and other particulate material from source water through settling before the water enters the primary clarification and filtration processes in a treatment plant.

PRESSURE REDUCING VALVE - a valve that opens automatically when the water pressure reaches a preset limit to relieve the stress on the pipeline.

PRESSURE VACUUM BREAKER ASSEMBLY - the combination of an independently-acting, internally-loaded check valve and an independently-acting loaded air inlet valve located on its discharge side, with test cocks and shutoff valves attached at each end of the combination.

PRIVATE WATER SYSTEM - a system for the provision of piped water for human consumption or domestic purposes having fewer than 15 service connections or serving an average of 25 individuals or fewer at least 60 days during the year.

PROJECT ENGINEER - same as ENGINEER.

PUBLIC WATER SYSTEM -

a. The term "public water system" means a system for the provision to the public of water for human consumption through pipes or other constructed conveyances, if such system has at least fifteen (15) service connections or regularly serves an average of at least twenty-five (25) individuals daily at least 60 days out of the year. Such term includes:

i. any collection, treatment, storage and distribution facilities under control of the operator of such system and which are used primarily in connection with such system; and

ii. any collection or pretreatment storage facilities not under such control which are used primarily in connection with such system. A public water system is either a "community water system" or a "noncommunity water system."

b. For purposes of paragraph A, a connection to a system that delivers water by a constructed conveyance other than a pipe shall not be considered a connection, if

i. The water is used exclusively for purposes other than residential uses (consisting of drinking, bathing, and cooking, or other similar uses);

ii. The Director determines that alternative water to achieve the equivalent level of public health protection provided by the applicable NNPDWR is provided for residential or similar uses for drinking and cooking; or

iii. The Director determines that the water provided for residential or similar uses for drinking, cooking, and bathing is centrally treated or treated at the point of entry by the provider, a pass-through entity, or the user to achieve the equivalent level of protection provided by the applicable NNPDWR.

PUBLIC WATER SYSTEM OWNER OR OPERATOR - any person who owns or operates a public water system within the jurisdiction of the Navajo Nation.

PWSSP - the Navajo Public Water Systems Supervision Program within the Navajo Nation Environmental Protection Agency.

REDUCED PRESSURE PRINCIPLE ASSEMBLY - two independently-acting, internally-loaded check valves with an automatic differential pressure relief valve located in between, shut-off valves located upstream and downstream of the two check valves, and test cocks to enable field testing.

REGION - one of the 10 geographical areas or regions of the country into which the U.S. Environmental Protection Agency (EPA) is divided, or the EPA Headquarters in Washington, DC (see http://www.epa.gov/epahome/locate2.htm).

REM - the unit of dose equivalent from ionizing radiation to the total body or any internal organ or organ system. A millirem (mrem) is 1/1000 of a rem.

REPEAT COMPLIANCE PERIOD - any subsequent compliance period after the initial compliance period.

RESOURCES COMMITTEE - means Resources Committee of the Navajo Nation Council.

RESIDUAL DISINFECTANT CONCENTRATION ("C" in CT calculations) - the concentration of disinfectant measured in mg/L in a representative sample of water.

RESPONSIBLE CHARGE - The Operator(s) in Responsible Charge is defined as the person(s) designated by the owner to be the certified operator(s) who makes decisions regarding the daily operational activities of a public water system, water treatment facility, and/or distribution system that will directly impact the quality and/or quantity of drinking water.

SDWA - The Public Health Service Act, as amended by the Safe Drinking Water Act, Public Law 93-523, 42 U.S.C. § 300f et seq.

SAMPLING REQUIREMENT - the sampling analysis and other appropriate measurements required of water systems by the Director.

SANITARY SEAL - a cap on the top of the well casing usually fitted with a rubber expansion gasket, which seals off surface drainage, thereby protecting the well from contamination directly down the casing.

SANITARY SURVEY - an on-site review of the water source, facilities, equipment, operation and maintenance of a public water system for the purpose of evaluating the adequacy of such source, facilities, equipment, operation and maintenance for producing and distributing safe drinking water.

SECONDARY MAXIMUM CONTAMINANT LEVEL - the maximum level of a contaminant in a public water system which, in the judgment of the Director, is requisite to protect the public welfare. The SMCL means the maximum permissible level of a contaminant in water which is delivered to the free flowing outlet of the ultimate user of the public water system. Contaminants added to the water under circumstances controlled by the user, except those resulting from corrosion of piping and plumbing caused by water quality, are excluded from this definition.

SEDIMENTATION - a process for removal of solids before filtration by gravity or separation.

SERVICE CONNECTION - a single physical connection from a water service main which provides water to one or more buildings.

SERVICE LINE SAMPLE - a one-liter sample of water collected in accordance with § 708(B)(3), that has been standing for at least 6 hours in a service line.

SLOW SAND FILTRATION - a process involving the passage of raw water through a bed of sand at low velocity (generally less than 0.4m/h) resulting in substantial particulate removal by physical and biological mechanisms.

SINGLE FAMILY STRUCTURE - for the purposes of Part VII (Lead and Copper Requirements), a building constructed as a single-family residence that is currently used as either a residence or a place of business.

SMALL WATER SYSTEM - for the purposes of Part VII (Lead and Copper Requirements), a water system that serves 3,300 persons or fewer.

STANDARD SAMPLE - the portion of finished drinking water that is examined for the presence of coliform bacteria.

STATIC WATER LEVEL - the vertical distance from the ground surface to the water level in a well when the water level is not affected by drawdown due to pumping.

SUBSTANTIAL MODIFICATION - a modification to a public water system that changes capacity, hydraulic condition, operation of treatment units, water treatment process, or the quality of water delivered to the consumer. A modification that costs at least $10,000 or involves the replacement or addition of at least 3 miles of service line.

SURFACE WATER - all water which is open to the atmosphere and is subject to surface runoff.

SURFACE WATER TREATMENT SYSTEMS - water systems using surface water or ground water under the direct influence of surface water as a source that are subject to the requirements of Part VIII of the NNPDWR.

SUVA - Specific Ultraviolet Absorption at 254 nanometers (nm), an indicator of the humic content of water. It is a calculated parameter obtained by dividing a sample's ultraviolet absorption at a wavelength of 254 nm (UV_{254}) (in m^{-1}) by its concentration of dissolved organic carbon (DOC) (in mg/L).

SYSTEM WITH A SINGLE SERVICE CONNECTION - a system which supplies drinking water to consumers via a single service line.

TIME OF TRAVEL (TOT) - the time period used to define the area through which ground water will move and recharge a pumping well.

TOTAL ORGANIC CARBON (TOC) - total organic carbon in mg/L measured using heat, oxygen, ultraviolet irradiation, chemical oxidants, or combinations of these oxidants that convert organic carbon to carbon dioxide, rounded to two significant figures.

TOO NUMEROUS TO COUNT (TNTC) - the total number of bacterial colonies exceeds 200 on a 47-mm diameter membrane filter used for coliform detection.

TRANSIENT NON-COMMUNITY WATER SYSTEM - a public water system that is not a community water system and that does not regularly serve at least 25 of the same persons for more than six months per year.

TREATMENT - a physical, chemical, or biological process intended to change or improve the quality of water.

TREATMENT FACILITY - any place(s) where a community water system or nontransient noncommunity water system alters the physical or chemical characteristics of the drinking water.

TOTAL TRIHALOMETHANES (TTHM) - the sum of the concentration in milligrams per liter (mg/L) of the trihalomethane compounds (trichloromethane, [chloroform], dibromochloromethane, bromodichloromethane, and tribromomethane [bromoform]), rounded to two significant figures.

TRIGGER LEVEL - the concentration of a contaminant that can initiate either an increase or decrease in monitoring for that contaminant.

TRIHALOMETHANE (THM) - one of the family of organic compounds, named as derivatives of methane, wherein three of the four hydrogen atoms in methane are each substituted by a halogen atom in the molecular structure.

TURBIDITY UNIT - Turbidity in water is caused by suspended matter such as clay, silt, finely divided organic and inorganic matter, soluble colored organic compounds, and plankton and other microscopic organisms. Turbidity is an expression of the optical property that causes light to be scattered and absorbed rather than transmitted in straight lines through the sample, and is used as an indicator of treatment effectiveness, specifically for clarification and filtration processes. Turbidity is measured in Nephelometric Turbidity Units (NTU).

TWO-STAGE LIME SOFTENING - a process in which chemical addition and hardness precipitation occur in each of two distinct unit clarification processes in series prior to filtration.

UNCOVERED FINISHED WATER STORAGE FACILITY - a tank, reservoir, or other facility used to store water that will undergo no further treatment to reduce microbial pathogens except residual disinfection and that is directly open to the atmosphere.

UNIFORM RULES - The Navajo Nation Environmental Protection Agency Uniform Regulations for Permit Review, Administrative Enforcement Orders, Hearings, and Rulemaking under Navajo Nation Environmental Acts.

UNREGULATED CONTAMINANT - a known or suspected disease-causing contaminant for which no maximum contaminant level has been established.

VALIDATED EXAM - an exam that is independently reviewed by subject matter experts to ensure it is based on a job analysis and related to the classification of the system or facility.

VARIANCE - a waiver from certain provisions of these regulations granted, by the Director, to a public water system pursuant to the NNSDWA and §105 of these regulations.

VIABLE WATER SYSTEM - a water system which is self-sustaining and has the commitment and the financial, managerial and technical capability to consistently comply with the NNSDWA and the NNPDWR.

VIRUS - a virus of fecal origin that is infectious to humans by waterborne transmission.

WATERBORNE DISEASE OUTBREAK - the significant occurrence of acute infectious illness, epidemiologically associated with the ingestion of water from a public water system which is deficient in treatment, as determined by the Director or PWSSP.

WATER SUPPLY SOURCE - a well, spring, infiltration gallery, intake structure, or other source of piped water for human consumption.

WATER TABLE (UNCONFINED) AQUIFER - an aquifer in which ground water is under atmospheric pressure.

WATER USER - any person that is authorized to receive water from the public water system.

WELL - a bored, drilled or driven shaft, or a dug hole whose depth is greater than the largest surface dimension, from which water is extracted or injected.

WELLFIELD - an area containing two or more wells with overlapping zones of contribution that supply a public water system.

WELLHEAD - the physical structure, facility, or device at the ground surface from or through which groundwater flows or is pumped from water-bearing formations.

WELL CASING - tubular retaining structure, generally metal, which is installed in the excavated hole to maintain the well opening.

WELLHEAD PROTECTION - a program that reduces the threat to the quality of ground water used for drinking water by identifying and managing recharge areas to specific wells or well fields. As defined by P.L. 99-339, a wellhead protection area is a surface or subsurface area that surrounds an individual water well or wellfield that is used by a public water system. It is designed to incorporate the groundwater or surface water supplies that are likely to be drawn to the well system. The pumping of a well causes a conical "V" shaped depression in the underlying water table that varies as a result of differing geographic and hydrologic conditions. The water within this zone of depression would be likely to reach the well at some time, and so would any groundwater contaminants within that zone. By restricting surface activities over these zones, protection of the resource is enhanced.

WELLHEAD PROTECTION AREA- see WELLHEAD PROTECTION

WHOLESALE SYSTEM - a public water system that treats source water as necessary to produce finished water and then delivers some or all of that finished water to another public water system. Delivery may be through a direct connection or through the distribution system of one or more consecutive systems.

§ 105 VARIANCES AND EXEMPTIONS

A. Variances and exemptions from certain provisions of these regulations may be granted by the Director pursuant to subchapter 6 of the Navajo Nation Safe Drinking Water Act, except that variances and exemptions from the MCL for total coliforms and variances from any of the treatment technique requirements of Part VIII, General Requirements for Surface Water Treatment, may not be granted.

B. EPA has stayed the effective date of this section relating to the total coliform MCL of § 205 for systems that demonstrate to the Director that the violation of the total coliform MCL is due to a persistent growth of total coliforms in the distribution system rather than fecal or pathogenic contamination, a treatment lapse or deficiency, or a problem in the operation or maintenance of the distribution system.

§ 106 SITING REQUIREMENTS

Before a person may enter into a financial commitment for or initiate construction of a new public water system or increase the capacity of an existing public water system, he shall notify the Director, comply with the requirements of § 2524 of the NNSDWA and §1500-Minimum Design Regulations of these regulations and to the extent practicable, avoid locating part or all of the new or expanded facility at a site which:

A. Is subject to a significant risk from earthquakes, floods, fires or other disasters which could cause a breakdown of the public water system or any portion thereof; or

B. Except for intake structures, is within the floodplain of a 100-year flood, or is lower than any recorded high tide where appropriate records exist.

Permits to construct and permits to operate a public water system may be obtained from the Public Water Systems Supervision Program. Permits to drill wells may be obtained from the Navajo Nation Department of Water Resource Management, Water Code Section, (928) 729-4004.

§ 107 APPLICABILITY

A. Except as provided in section 107 (B), these regulations apply to all public water systems within the Navajo Nation as described in the Navajo Nation Safe Drinking Water Act.

B. These regulations do not apply to any public water system that meets all of the following conditions:

1. it consists only of distribution and storage facilities (and does not have any collection and treatment facilities);

2. it obtains all of its water from, but is not owned or operated by, a public water system to which these regulations apply;

3. it does not sell water to any person;

4. it is not a carrier that conveys passengers in interstate commerce; and

5. it does not provide water to any school, tribal, state or federal governmental employees or private entity serving an average of twenty-five (25) or more employees or individuals daily at least 60 days out of the year.

C. These regulations are effective immediately upon promulgation, which occurs upon approval by the Resources Committee, unless specific regulations herein provide for a different effective date.

§ 108 SEVERABILITY

If any provision of these regulations or the application thereof to any person or circumstance is held invalid, the remainder of these regulations and the application of such provision to other persons or circumstances shall remain unaffected, and to this end the provisions of these regulations are declared to be severable.

§ 109 OPERATING PERMITS

A. Public water systems and bottled water systems shall obtain and maintain an operating permit from the Director.

B. For existing public water systems and bottled water systems, for the first time, the owner or the entity responsible for operation and maintenance shall complete and submit an application form for an operating permit within ninety (90) days of the effective date of these regulations, as provided in § 202 of the Uniform Rules. A copy of the application form may be obtained from the Public Water Systems Supervision Program. If an existing system has submitted a timely and complete application for an operating permit (including a renewal operating permit), but the Director has not taken final action on the application, the existing system's failure to have a permit shall not be a violation of the NNSDWA or these regulations, unless the delay in final action was due to the failure of the applicant to timely submit information required or requested to process the application.

C. For new public water systems and bottled water systems, the owner or the entity responsible for operation and maintenance shall submit an operating permit application after obtaining the approval of construction from the Director.

D. The owner or the entity responsible for operation and maintenance shall submit an application fee together with the operating permit application, as determined by the Director, and as provided in § 202(a) of the Uniform Rules.

E. The Director will review the application for completeness and will issue the Operating Permit pursuant to the permitting provisions in subpart 2 of the Uniform Rules.

F. For new public water systems, a certified operator of appropriate level as determined according to §1405 must be assigned to the system before the operating permit can be issued. Existing systems that do not have an operator certified to the appropriate level shall obtain certification within the time specified in the operating permit.

G. The operating permit shall be good for three (3) years. Application for renewal must be submitted at least 30 days before the expiration of the permit. The renewal fee will be the same as the first time application fee as given in §109(D).

H. The Director may revoke an operating permit according to the procedures in § 204 of the Uniform Rules, for any water system that is unable to demonstrate its ability to remain a viable water system, as defined in § 104 of NNPDWR.

I. The Director may modify an operating permit at any time to include any new promulgated requirements of the NNSDWA or NNPDWR to include any approved or permitted construction modifications to the system, or to modify a compliance schedule. The Director will modify a permit according to the procedures set forth in the Uniform Rules.

J. The permittee may request a modification of the operating permit at anytime with adequate justification. The permittee shall complete and submit to the Director an operating permit application form along with a detailed justification for the modification(s) requested. Permit modifications will be issued by the Director on a case by case basis, pursuant to § 204 of the Uniform Rules.

K. An operating permit is non-transferable, except with prior approval of the Director. The permittee shall submit written notification to the Director at least 30 days in advance of the proposed transfer. This notification shall include an operating permit application form which has been completed by the proposed new owner of the system. The Director may request on a case by case basis that the proposed new owner of the system submit a business plan which shows how the system will be managed to ensure its long term viability. If the Director approves the transfer, a new operating permit will be issued to the new owner of the system.

L. If an existing public water system or a bottled water system is out of compliance with any of the requirements of the NNSDWA or NNPDWR, the Director may include in the operating permit a schedule for achieving compliance with such requirements.

M. If an existing public water system is divided into two or more smaller water systems, each of the smaller water systems shall comply with the water quality monitoring requirements of the water system prior to it being divided.

N. An operating permit does not convey any property right of any sort, or any exclusive privilege.

O. The permittee shall allow the Director or an authorized representative, upon the presentation of credentials and/or other documentation as may be required by law, to:

1. Gain entry into the permittee's premises where a regulated facility or activity is located or conducted, or where records are kept;

2. Have access to and copy any records that must be kept under the conditions of this permit;

3. Inspect at reasonable times any facility, equipment, practice or operation regulated or required under this permit; and

4. Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the NNSDWA, any substance or parameter at any location.

P. The permittee shall report any noncompliance which may endanger public water systems or public health. An oral report, by telephone or in person, must be provided to the Public Water Systems Supervision Program within 24 hours from the time the permittee becomes aware of the circumstances. A written report shall follow within 5 working days of the time the permittee becomes aware of the circumstances. The written report shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times and, if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

Q. All public water systems should develop an "Operation and Maintenance Manual" and a copy of the manual should be readily accessible to the inspectors from the Navajo Nation Environmental Protection Agency when requested. The manual should contain the following information:

1. Schematics of the system showing sources, treatment processes, storage, distribution mains, service lines, pumps, valves, pressure tanks, hydrants, and control systems;

2. Details about manual, automatic, and semi-automatic controls and trouble-shooting for all the pumps, valves, tanks and treatment units;

3. Safety procedures for chemical handling, explosion and fire hazards;

4. Water sampling requirements and schedules including a sampling site plan; and

5. Emergency water supply plan.

§ 110 NO WAIVER OF SOVEREIGN IMMUNITY

These regulations shall not constitute a waiver of sovereign immunity. NNEPA assumes no liability for public water system malfunction or under-performance. NNEPA only prescribes minimum design requirements, which shall not diminish the duty of owners and operators to comply with applicable statutes and regulations and industry standards and to provide adequate system design, construction, operation, maintenance and performance.

PART II
MAXIMUM CONTAMINANT LEVELS

§ 201 PURPOSE

The purpose of this part is to define the Maximum Contaminant Levels, or MCL, for each contaminant.

§ 202 SPECIAL MAXIMUM CONTAMINANT LEVELS for ARSENIC and NITRATE

A. The MCL for arsenic of 0.010 mg/L or 10 parts per billion (10ppb) applies to community water systems and non-transient, non-community water systems and shall become effective January 23, 2006.

1. Compliance with the MCL for arsenic is calculated pursuant to § 405.

2. The owner/operator shall report the most recent arsenic levels in their water systems. These levels and health effects shall be reported in the Consumer Confidence Reports required by Part XII of these regulations.

B. The MCL for nitrate is 10mg/L or 10 parts per million (10ppm).

C. At the discretion of the Director, nitrate levels not exceeding 20 mg/L may be allowed in a non-community water system if the public water system owner or operator demonstrates to the satisfaction of the Director that:

1. Such water will not be available to children under six months of age;

2. There will be continuous public notification stating that nitrate levels exceed 10 mg/L and lists the potential health effects due to exposure;

3. PWSSP shall be notified annually of nitrate levels that exceed 10 mg/L; and

4. No adverse health effects shall result.

§ 203 MAXIMUM CONTAMINANT LEVELS and MAXIMUM CONTAMINANT LEVEL GOALS FOR INORGANIC CONTAMINANTS

A. Applicability

1. The MCLs for inorganic contaminants (1)-(10), (12)-(13), and (17)-(18) of Table 200.1 applies to community water systems (CWS) and non-transient, non-community water systems (NTNCWS).

2. The MCL specified in (11) of Table 200.1 only applies to CWSs.

3. The MCLs specified in (14)-(16) of Table 200.1 apply to CWSs; NTNCWSs; and transient non-community water systems (TNCWS).

4. The MCLs specified in (14), (15) and (16) of Table 200.1 apply to consecutive public water systems. Other MCL sampling requirements will be determined, by the Director, after a sanitary survey of the system, a wellhead protection delineation or a vulnerability assessment survey indicates that further sampling requirements are needed. MCL sampling for asbestos (4) is required for those systems with asbestos-cement pipe in the distribution system.

5. BAT(s) are the best available technology, treatment technique, or other means available for achieving compliance with the MCLs for inorganic contaminants and are identified in Table 200.1.

TABLE 200.1 MAXIMUM CONTAMINANT LEVELS, MAXIMUM CONTAMINANT LEVEL GOALS with EFFECTIVE DATES for INORGANIC CONTAMINANTS

#	EFFECTIVE DATE	CONTAMINANT	MCL mg/L	MCLG mg/L	BATs
1	3/21/1996	Antimony	0.006	0.006	2,7

2	3/21/1996	Arsenic[4]	0.05	Zero	1,2,5,6,7,9,12[5]
3	1/23/2006	Arsenic[4]	0.010[6]	Zero	1,2,5,6,7,9,12[5]
4	3/21/1996	Asbestos	7 million fibers/liter (longer than 10μm)	7 million fibers/liter (longer than 10μm)	2,3,8
5	3/21/1996	Barium	2	2	5,6,7,9
6	3/21/1996	Beryllium	0.004	0.004	1,2,5,6,7
7	3/21/1996	Cadmium	0.005	0.005	2,5,6,7
8	3/21/1996	Chromium	0.1	0.1	2,5,6[2], 7
9	3/21/1996	Copper		1.3	
10	3/21/1996	Cyanide (as free cyanide)	0.2	0.2	5,7,10
11	3/21/1996	Fluoride	4.0	4.0	
12	3/21/1996	Lead	0.015	Zero	
13	3/21/1996	Mercury	0.002	0.002	2[1],4,6[1],7[1]
14	3/21/1996	Nitrate	10 (as Nitrogen)	10 (as Nitrogen)	5,7,9
15	3/21/1996	Nitrite	1 (as Nitrogen)	1 (as Nitrogen)	5,7
16	3/21/1996	Total Nitrate and Nitrite	10 (as Nitrogen)	10 (as Nitrogen)	
17	3/21/1996	Selenium	0.05	0.05	1,2[3],6,7,9
18	3/21/1996	Thallium	0.002	0.0005	1,5

[1] BAT only if influent Hg concentrations ≤10 micrograms/liter.
[2] BAT for Chromium III only.
[3] BAT for Selenium IV only.
[4] BATs for Arsenic V. Pre-oxidation may be required to convert Arsenic III to Arsenic V.
[5] To obtain high removals, iron to arsenic ratio must be at least 20:1.
[6] This MCL will replace the 0.05 mg/L MCL and will apply to CWS and NTNCWS, effective January 23, 2006.

Key to BAT(s) in Table 200.1

1 = Activated Alumina 2 = Coagulation/Filtration (Not BAT for systems <500 service connections) 3 = Direct & Diatomite Filtration	4 = Granular Activated Carbon 5 = Ion Exchange 6 = Lime Softening (Not BAT for systems <500 service connections)	7 = Reverse Osmosis 8 = Corrosion Control 9 = Electrodialysis 10= Chlorine 11= Ultraviolet 12= Oxidation / Filtration

6. The Administrator, pursuant to section 1412 of the Safe Drinking Water Act (SDWA), hereby

identifies in the following table the affordable technology, treatment technique or other means available to systems serving 10,000 persons or fewer for achieving compliance with the maximum contaminant level for arsenic:

TABLE 200.2 SMALL SYSTEM COMPLIANCE TECHNOLOGIES (SSCTS)[1] FOR ARSENIC[2]

Small system compliance technology	Affordable for listed small system categories[3]
Activated Alumina (centralized)	All size categories.
Activated Alumina (Point-of-Use)[4]	All size categories.
Coagulation/Filtration[5]	501-3,300 and 3,301-10,000.
Coagulation-assisted Micro-filtration	501-3,300 and 3,301-10,000.
Electrodialysis reversal[6]	501-3,300 and 3,301-10,000.
Enhanced coagulation/Filtration	All size categories.
Enhanced lime softening (pH>10.5)	All size categories.
Ion Exchange	All size categories.
Lime Softening	501-3,300 and 3,301-10,000.
Oxidation/Filtration[7]	All size categories.
Reverse Osmosis (centralized)[6]	501-3,300 and 3,301-10,000.
Reverse Osmosis (Point-of-Use)[4]	All size categories.

[1]Section 1412 (b)(4)(E)(ii) of the SDWA specifies that SSCTs must be affordable and technically feasible for small systems.
[2]SSCTs for Arsenic V. Pre-oxidation may be required to convert Arsenic III to Arsenic V.
[3]The Act (ibid.) Specifies three categories of small systems; (i) those serving 25 or more, but fewer than 501, (ii) those serving more than 500, but fewer than 3,301, and (iii) those serving more than 3,300 but fewer than 10,001.
[4]When POU or POE devices are used for compliance, programs to ensure proper long-term operation, maintenance, and monitoring must be provided by the water system to ensure adequate performance.
[5]Unlikely to be installed solely for arsenic removal. May require pH adjustment to optimal range if high removals are needed.
[6]Technologies reject a large volume of water, may not be appropriate for areas where water quantity may be an issue.
[7]To obtain high removals, iron to arsenic ratio must be at least 20:1.

§ 204 MAXIMUM CONTAMINANT LEVELS and MAXIMUM CONTAMINANT LEVEL GOALS FOR ORGANIC CONTAMINANTS

A. Applicability

1. The following MCLs for organic contaminants apply to CWSs and NTNCWSs.

TABLE 200.3 MAXIMUM CONTAMINANT LEVELS and MAXIMUM CONTAMINANT LEVEL GOALS for VOLATILE ORGANIC CHEMICALS with EFFECTIVE DATES

#	CAS[1] No.	EFFECTIVE DATES	CONTAMINANT	MCL mg/L	MCLG mg/L
1	75-01-4	3/21/1996	Vinyl chloride	0.002	0.00
2	71-43-2	3/21/1996	Benzene	0.005	0.00
3	56-23-5	3/21/1996	Carbon tetrachloride	0.005	0.00
4	107-06-2	3/21/1996	1,2-Dichloroethane	0.005	0.00
5	79-01-6	3/21/1996	Trichloroethylene	0.005	0.00

6	106-46-7	3/21/1996	para-Dichlorobenzene	0.075	0.075
7	75-35-4	3/21/1996	1,1-Dichloroethylene	0.007	0.007
8	71-55-6	3/21/1996	1,1,1-Trichloroethane	0.2	0.20
9	156-59-2	3/21/1996	cis-1,2-Dichloroethylene	0.07	0.07
10	78-87-5	3/21/1996	1,2-Dichloropropane	0.005	0.00
11	100-41-4	3/21/1996	Ethylbenzene	0.7	0.7
12	108-90-7	3/21/1996	Monochlorobenzene	0.1	0.1
13	95-50-1	3/21/1996	o-Dichlorobenzene	0.6	0.6
14	100-42-5	3/21/1996	Styrene	0.1	0.1
15	127-18-4	3/21/1996	Tetrachloroethylene	0.005	0.00
16	108-88-3	3/21/1996	Toluene	1	1
17	156-60-5	3/21/1996	trans-1,2-Dichloroethylene	0.1	0.1
18	1330-20-7	3/21/1996	Xylenes (total)	10	10
19	75-09-2	3/21/1996	Dichloromethane	0.005	0.00
20	120-82-1	3/21/1996	1,2,4-Trichlorobenzene	0.07	0.07
21	79-00-5	3/21/1996	1,1,2-Trichloroethane	0.005	0.003

[1]Chemical Abstract Service Number

2. The following MCLs and MCLGs for synthetic organic contaminants apply to CWSs and NTNCWS.

TABLE 200.4 MAXIMUM CONTAMINANT LEVELS, MAXIMUM CONTAMINANT LEVEL GOALS with EFFECTIVE DATES for SYNTHETIC ORGANIC CHEMICALS

#	CAS No.	EFFECTIVE DATES	CONTAMINANT	MCL mg/L	MCLG mg/L
1	15972-60-8	3/21/1996	Alachlor	0.002	0.00
2	116-06-3	3/21/1996	Aldicarb	0.003	0.001
3	1646-87-3	3/21/1996	Aldicarb sulfoxide	0.004	0.001
4	1646-87-4	3/21/1996	Aldicarb sulfone	0.002	0.001
5	1912-24-9	3/21/1996	Atrazine	0.003	0.003
6	1563-66-2	3/21/1996	Carbofuran	0.04	0.04
7	57-74-9	3/21/1996	Chlordane	0.002	0.00
8	96-12-8	3/21/1996	Dibromochloropropane	0.0002	0.00
9	94-75-7	3/21/1996	2,4-D	0.07	0.07

10	106-93-4	3/21/1996	Ethylene dibromide	0.00005	0.00
11	76-44-8	3/21/1996	Heptachlor	0.0004	0.00
12	1024-57-3	3/21/1996	Heptachlor epoxide	0.0002	0.00
13	58-89-9	3/21/1996	Lindane	0.0002	0.0002
14	72-43-5	3/21/1996	Methoxychlor	0.04	0.04
15	1336-36-3	3/21/1996	Polychlorinated biphenyls	0.0005	0.00
16	87-86-5	3/21/1996	Pentachlorophenol	0.001	0.00
17	8001-35-2	3/21/1996	Toxaphene	0.003	0.00
18	93-72-1	3/21/1996	2,4,5-TP	0.05	0.05
19	50-32-8	3/21/1996	Benzo[a]pyrene	0.0002	0.00
20	75-99-0	3/21/1996	Dalapon	0.2	0.2
21	103-23-1	3/21/1996	Di(2-ethylhexyl)adipate	0.4	0.4
22	117-81-7	3/21/1996	Di(2-ethylhexyl)phthalate	0.006	0.00
23	88-85-7	3/21/1996	Dinoseb	0.007	0.007
24	85-00-7	3/21/1996	Diquat	0.02	0.02
25	145-73-3	3/21/1996	Endothall	0.1	0.1
26	72-20-8	3/21/1996	Endrin	0.002	0.002
27	1071-83-6	3/21/1996	Glyphosate	0.7	0.7
28	118-74-1	3/21/1996	Hexachlorobenzene	0.001	0.00
29	77-47-4	3/21/1996	Hexachlorocyclopentadiene	0.05	0.05
30	23135-22-0	3/21/1996	Oxamyl (Vydate)	0.2	0.2
31	1918-02-1	3/21/1996	Picloram	0.5	0.5
32	122-34-9	3/21/1996	Simazine	0.004	0.004
33	1746-01-6	3/21/1996	2,3,7,8-TCDD (Dioxin)	$3x10^{-8}$	0.00

B. The Administrator pursuant to §1412 of the SDWA has identified as indicated in Table 200.5 the granular activated carbon (GAC), packed tower aeration (PTA), or oxidation (OX) techniques as the best technology treatment technique or other means available for achieving compliance with the MCL for organic contaminants identified in subsections (A)(1) and (A)(2)of this section:

TABLE 200.5 BAT FOR ORGANIC CONTAMINANTS (SYNTHETIC AND VOLATILE)

#	CAS No.	CONTAMINANT	GAC	PTA	OX
1	15972-60-8	Alachlor	X		
2	116-06-3	Aldicarb	X		
3	1646-88-4	Aldicarb sulfone	X		
4	1646-87-3	Aldicarb sulfoxide	X		
5	1912-24-9	Atrazine	X		
6	71-43-2	Benzene	X	X	
7	50-32-8	Benzo[a]pyrene	X		
8	1563-66-2	Carbofuran	X		
9	56-23-5	Carbon tetrachloride	X	X	
10	57-74-9	Chlordane	X		
11	75-99-0	Dalapon	X		
12	94-75-7	2,4-D	X		
13	103-23-1	Di(2-ethylhexyl)adipate	X	X	
14	117-81-7	Di(2-ethylhexyl)phthalate	X		
15	96-12-8	Dibromochloroproprane (DBCP)	X	X	
16	95-50-1	o-Dichlorobenzene	X	X	
17	106-46-7	para-Dichlorobenzene	X	X	
18	107-06-2	1,2-Dichloroethane	X	X	
19	75-35-4	1,1-Dichloroethylene	X	X	
20	156-59-2	cis-1,2-Dichloroethylene	X	X	
21	156-60-5	trans-1,2-Dichloroethylene	X	X	
22	75-09-2	Dichloromethane		X	
23	78-87-5	1,2-Dichloropropane	X	X	
24	88-85-7	Dinoseb	X		
25	85-00-7	Diquat	X		
26	145-73-3	Endothall	X		
27	72-20-8	Endrin	X		

28	100-41-4	Ethylbenzene	X	X	
29	106-93-4	Ethylene Dibromide (EDB)	X	X	
30	1071-83-6	Glyphosate			X
31	76-44-8	Heptachlor	X		
32	1024-57-3	Heptachlor epoxide	X		
33	118-74-1	Hexachlorobenzene	X		
34	77-47-3	Hexachlorocyclopentadiene	X	X	
35	58-89-9	Lindane	X		
36	72-43-5	Methoxychlor	X		
37	108-90-7	Monochlorobenzene	X	X	
38	23135-22-0	Oxamyl (Vydate)	X		
39	87-86-5	Pentachlorophenol	X		
40	1918-02-1	Picloram	X		
41	1336-36-3	Polychlorinated biphenyls (PCB)	X		
42	122-34-9	Simazine	X		
43	100-42-5	Styrene	X	X	
44	1746-01-6	2,3,7,8-TCDD (Dioxin)	X		
45	127-18-4	Tetrachloroethylene	X	X	
46	108-88-3	Toluene	X	X	
47	8001-35-2	Toxaphene	X		
48	93-72-1	2,4,5-TP (Silvex)	X		
49	120-82-1	1,2,4-Trichlorobenzene	X	X	
50	71-55-6	1,1,1-Trichloroethane	X	X	
51	79-00-5	1,1,2-Trichloroethane	X	X	
52	79-01-6	Trichloroethylene	X	X	
53	75-01-4	Vinyl chloride		X	
54	1330-20-7	Xylene	X	X	

§ 205 MAXIMUM CONTAMINANT LEVELS and MAXIMUM CONTAMINANT LEVEL GOALS FOR MICROBIOLOGICAL CONTAMINANTS

A. A public water system must determine compliance with the MCL for total coliforms in subsections (B) and (C) of this section for each month in which it is required to monitor for total coliforms.

B. Applicability

1. Each CWS, NTNCWS, TNCWS and Consecutive system is required to comply with this section. The MCL for total coliform is based on the presence or absence in a sample, rather than coliform density.

TABLE 200.6 MAXIMUM CONTAMINANT LEVELS and MAXIMUM CONTAMINANT LEVEL GOALS FOR MICROBIOLOGICAL CONTAMINANTS

#	CONTAMINANT	MCL	MCLG
1	*Giardia lamblia*	zero	zero
2	Viruses	zero	zero
3	*Legionella*	zero	zero
4	Total coliforms (including fecal coliforms and *Escherichia coli*)	zero	zero
5	Cryptosporidium	zero	zero

C. Compliance

1. For a system that collects 40 or more samples per month, the system is in compliance with the MCL for total coliforms if no more than 5.0% of the samples collected during the month are total coliform-positive.

2. For a system that collects less than 40 samples per month, the system is in compliance with the MCL for total coliforms if no more than one sample collected during the month is total coliform-positive.

3. Any fecal coliform-positive repeat sample or E.*coli*-positive repeat sample, or any total coliform-positive repeat sample following a fecal coliform-positive or E-*coli*-positive routine sample constitutes a violation of the MCL for total coliforms. For purposes of the public notification requirements in Part VI, this is a violation that may pose an acute risk to health.

D. The following are identified as the best available technology, treatment techniques, or other means to achieve compliance with the MCL for total coliforms in subsections (B) and (C) of this section:

1. Protection of wells from total coliform contamination by appropriate construction and location;

2. Maintain a disinfectant residual throughout the distribution system;

3. Proper maintenance of the distribution system including appropriate pipe replacement and repair procedures, adequate flushing programs, proper operation and maintenance of storage tanks and reservoirs, and continual maintenance of positive water pressure in all parts of the distribution system;

4. Filtration and/or disinfection of surface water, as described in Parts VIII and XIII (General Requirements for Surface Water Treatment and Enhanced Surface Water Treatment), or disinfection of groundwater using strong oxidants such as chlorine, chlorine dioxide, or ozone;

5. For systems using groundwater, compliance with the requirements of an NNEPA-approved Wellhead Protection Program that is developed and implemented pursuant to § 2538 of the NNSDWA and Part XVII of these regulations-Wellhead Protection Regulations; and

6. Proper placement, maintenance and testing of backflow prevention and cross connection

devices, as described in Part XX of these regulations.

§ 206 MAXIMUM CONTAMINANT LEVELS FOR TURBIDITY

The MCL for turbidity are applicable to both community and non-community water systems using surface water sources in whole or in part. The MCL for turbidity in drinking water, measured at a representative entry point(s) to the distribution system are:

A. One turbidity unit (TU), as determined by a monthly average pursuant to § 414, except that five or fewer turbidity units may be allowed if the public water system owner or operator can demonstrate to the Director that the higher turbidity level does not:

1. Interfere with disinfection;

2. Prevent maintenance of an effective disinfectant agent throughout the distribution system; or

3. Interfere with microbiological determinations.

B. Five turbidity units based on an average for two consecutive days pursuant to § 414.

§ 207 MAXIMUM CONTAMINANT LEVELS and MAXIMUM CONTAMINANT LEVEL GOALS for DISINFECTION BYPRODUCTS

A. Applicability

1. The MCLs and MCLGs for Disinfection Byproducts are as follows:

TABLE 200.7 MCLs FOR DISINFECTION BYPRODUCTS

Disinfection Byproduct	MCL (mg/L)	MCLG (mg/L)
Total Trihalomethanes (TTHM)	0.080	
Haloacetic acids (five) (HAA5)	0.060	
Bromate	0.010	Zero
Chlorite	1.0	0.8
Bromodichloromethane		Zero
Bromoform		Zero
Chloroform		0.07
Dichloroacetic Acid		Zero
Trichloroacetic Acid		0.02
Dibromochloromethane		0.06
Monochloroacetic Acid		0.07

B. Compliance Dates

1. All CWSs and NTNCWSs:

a. Part VIII - General Requirements for Surface Water Systems serving 10,000 or more persons must comply with this section upon promulgation of these regulations;

b. Part VIII - General Requirements for Surface Water Systems serving fewer than 10,000 persons must comply with this section beginning January 1, 2004;

c. Public water systems using only ground water not under the direct influence of surface water must comply with this section beginning January 1, 2004.

d. All systems must comply with the MCLs listed in this section until the date specified for Part XXIII compliance in §2300(C).

i. Part XXIII MCLs for TTHM and HAA5 must be complied with as a locational running annual average at each monitoring location beginning with the date specified for Part XXIII compliance in §2301(C).

2. A system that is installing GAC or membrane technology to comply with this section may apply to the Director for an extension of up to 24 months past the date of promulgation of these regulations, but not beyond December 31, 2003. In granting the extension, the Director must set a schedule for compliance and may specify any interim measures that the system

must take. Failure to meet the schedule or interim treatment requirements constitutes a violation of the NNPDWR.

C. The Administrator, pursuant to § 1412 of the SDWA, has identified the following as the best available technology, treatment techniques, or other means available to achieve compliance with the MCLs for disinfection byproducts identified in subsection (A) of this section:

TABLE 200.8 BATs FOR DISINFECTION BYPRODUCTS

Disinfection Byproduct	Best Available Technology
TTHM	Enhanced coagulation or enhanced softening or GAC10, with chlorine as the primary and residual disinfectant.
HAA5	Enhanced coagulation or enhanced softening or GAC10, with chlorine as the primary and residual disinfectant.
Bromate	Control of ozone treatment processes to reduce production of bromate.
Chlorite	Control of treatment processes to reduce disinfectant demand and control of disinfection treatment processes to reduce disinfectant levels.

D. The Administrator, pursuant to section 1412 of the SDWA, hereby identifies the following as the best technology, treatment techniques, or other means available for achieving compliance with the maximum contaminant levels for TTHM and HAA5 identified in this subsection (D) for all systems that disinfect their source water:

Disinfection byproduct	Best available technology
Total trihalomethanes (TTHM) and Haloacetic acids (five) (HAA5).	Enhanced coagulation or enhanced softening, plus GAC10; or nanofiltration with a molecular weight cutoff ≤1000 Daltons; or GAC20.

E. The Administrator, pursuant to section 1412 of the SDWA, hereby identifies the following as the best technology, treatment techniques, or other means available for achieving compliance with the maximum contaminant levels for TTHM and HAA5 identified in this subsection (E) for consecutive systems that buy or otherwise receive finished water:

Disinfection byproduct	Best available technology
Total trihalomethanes (TTHM) and Haloacetic acids (five) (HAA5).	Systems serving ≥10,000: Improved distribution system and storage tank management to reduce residence time, plus the use of chloramines for disinfectant residual maintenance Systems serving ≤10,000: Improved distribution system and storage tank management to reduce residence time

§ 208 MAXIMUM RESIDUAL DISINFECTANT LEVELS and MAXIMUM RESIDUAL DISINFECTANT LEVEL GOALS

A. Applicability

1. The Maximum Residual Disinfectant Levels and Maximum Residual Disinfectant Level Goals are as follows:

TABLE 200.9 MAXIMUM RESIDUAL DISINFECTANT LEVELS (MRDLs) and MAXIMUM RESIDUAL DISINFECTANT LEVEL GOALS (MRDLGs)

Disinfectant residual	MRDL (mg/L)	MRDLG (mg/L)
Chlorine	4.0 (as Cl_2)	4.0 (as Cl_2)
Chloramines	4.0 (as Cl_2)	4.0 (as Cl_2)
Chlorine dioxide	0.8 (as ClO_2)	0.8 (as ClO_2)

B. Compliance Dates

1. All CWSs and NTNCWSs:

a. Part VIII - General Requirements for Surface Water Systems serving 10,000 or more persons must comply with this section upon promulgation of these regulations;

b. Part VIII - General Requirements for Surface Water Systems serving fewer than 10,000 persons must comply with this section beginning January 1, 2004;

c. Public water systems using only ground water, not under the direct influence of surface water, must comply with this section beginning January 1, 2004.

2. All TNCWSs:

a. Part VIII - General Requirements for Surface Water Systems serving 10,000 or more persons and using chlorine dioxide as a disinfectant or oxidant must comply with the chlorine dioxide MRDL upon promulgation of these regulations;

b. Part VIII - General Requirements for Surface Water Systems serving fewer than 10,000 persons and using chlorine dioxide as a disinfectant or oxidant must comply with the chlorine dioxide MRDL beginning January 1, 2004;

c. Public water systems using only ground water, not under the direct influence of surface water, and using chlorine dioxide as a disinfectant or oxidant must comply with the chlorine dioxide MRDL beginning January 1, 2004.

C. The Administrator, pursuant to §1412 of the SDWA, has identified the following as the best available technology, treatment techniques, or other means available to achieve compliance with the maximum residual disinfectant levels identified in subsection (A) of this section: control of treatment processes to reduce disinfectant demand and control of disinfection treatment processes to reduce disinfectant levels.

§ 209 MAXIMUM CONTAMINANT LEVELS AND MAXIMUM CONTAMINANT LEVEL GOALS FOR RADIONUCLIDES

A. Applicability

1. The following MCLs and MCLGs for radionuclides apply to CWSs.

Table 200.10 MAXIMUM CONTAMINANT LEVELS and MAXIMUM CONTAMINANT LEVEL GOALS FOR RADIONUCLIDES

#	Contaminant	MCL	MCLG
1	Gross alpha particle activity	15 pCi/L (including radium-226 but excluding radon and uranium)	Zero
2	Combined radium-226 and radium-228	5 pCi/L (see note 1 below)	Zero
3	Beta particle and photon radioactivity	4 millirem/year (see notes 2 and 3 below)	Zero
4	Uranium	30 micrograms per liter (µg/L)	Zero

Notes:

1. The combined radium-226 and radium-228 value is determined by adding the results of the analysis for radium-226 and the analysis for radium-228.

2. The average annual concentration of beta particle and photon radioactivity from man-made radionuclides in drinking water must not produce an annual dose equivalent to the total body or any internal organ greater than 4 millirem/year (mrem/year).

3. Except for the radionuclides listed in Table 200.11, the concentration of man-made radionuclides causing 4 mrem total body or organ dose equivalents must be calculated on the basis of 2 liters per day drinking water intake using the 168 hour data list in "Maximum Permissible Body Burdens and Maximum Permissible Concentrations of Radionuclides in Air and in Water for Occupational Exposure, NBS (National Bureau of Standards) Handbook 69 as amended August 1963, U.S. Department of Commerce[1]. If two or more radionuclides are present, the sum of their annual dose equivalent to the total body or to any organ shall not exceed 4 mrem/year.

[1] This incorporation by reference was approved by the Director of the Federal Register in accordance with

5 U.S.C. 552(a) and 1 CFR part 51. Copies of this document are available from the National Technical Information Service, NTIS ADA 280 282, U.S. Department of Commerce, 5285 Port Royal Road, Springfield, Virginia 22161. The toll-free number is 800-553-6847. Copies may be inspected at EPA's Drinking Water Docket, 401 M Street, SW., Washington, DC 20460; or at the Office of the Federal Register, 800 North Capitol Street, NW., Suite 700, Washington, DC.

TABLE 200.11 AVERAGE ANNUAL CONCENTRATIONS ASSUMED TO PRODUCE A TOTAL BODY OR ORGAN DOSE OF 4 mrem/yr

#	Radionuclide	Critical organ	pCi per liter
1	Tritium	Total body	20,000
2	Strontium-90	Bone marrow	8

B. Compliance dates for combined radium-226 and radium-228, gross alpha particle activity, gross beta particle, photon radioactivity, and uranium:

1. CWSs must comply with the MCLs listed in Table 200.10 beginning December 8, 2003 and compliance shall be determined in accordance with the requirements of § 411. Compliance with the reporting requirements for radionuclides is listed in Part XII (Consumer Confidence Report) Appendix F and Part VII (Public Notification) Appendices B and is required beginning December 8, 2003.

C. BATs for radionuclides

1. The Administrator pursuant to § 1412 of the SDWA has identified as indicated in the following table, the best available technology to achieve compliance with the MCLs for combined radium-226 and radium-228, uranium, gross alpha particle activity, beta particle and photon radioactivity.

TABLE 200.12 BATs FOR COMBINED RADIUM-226 AND RADIUM-228, URANIUM, GROSS ALPHA PARTICLE ACTIVITY, BETA PARTICLE AND PHOTON RADIOACTIVITY

#	Contaminant	BATs
1	Combined radium-226 and radium-228	Ion exchange, reverse osmosis, lime softening
2	Uranium	Ion exchange, reverse osmosis, lime softening, coagulation/filtration
3	Gross alpha particle activity (excluding radon and uranium)	Reverse osmosis
4	Beta particle and photon radioactivity	Ion exchange, reverse osmosis

D. Compliance technologies for radionuclides for small water systems

TABLE 200.13 COMPLIANCE TECHNOLOGIES FOR RADIONUCLIDES FOR SMALL WATER SYSTEMS AND LIMITATIONS OF USE

#	Unit Technologies	Limitations (see footnotes)	Operator skill level[1]	Raw water quality range and considerations[1]
1.	Ion exchange (IE)	a	Intermediate	All ground waters
2.	Point of use (POU[2])	b	Basic	All ground waters
3.	Reverse osmosis (RO)	c	Advanced	Surface waters usually require pre-filtration
4.	POU[2] RO	b	Basic	Surface waters usually require pre-filtration
5.	Lime softening	d	Advanced	All waters

6.	Green sand filtration	e	Basic	
7.	Co-precipitation with barium sulfate	f	Intermediate to Advanced	Ground waters with suitable water quality
8.	Electrodialysis/ electrodialysis reversal		Basic to Intermediate	All ground waters
9.	Pre-formed hydrous manganese oxide filtration	g	Intermediate	All ground waters
10.	Activated alumina	a, h	Advanced	All ground waters; competing anion concentrations may affect regeneration frequency
11.	Enhanced coagulation/ filtration	i	Advanced	Can treat a wide range of water qualities

[1] National Research Council (NRC). Safe Water from Every Tap: Improving Water Service to Small Communities. National Academy Press. Washington, D.C. 1997. Basic means Level 1, Intermediate means Level 2 or 3 and Advanced means Level 4 as defined in §1400.

[2] A POU, or ``point-of-use'' technology is a treatment device installed at a single tap used for the purpose of reducing contaminants in drinking water at that one tap. POU devices are typically installed at the kitchen tap. See the April 21, 2000 NODA for more details.

Limitations Footnotes: Technologies for Radionuclides:

a The regeneration solution contains high concentrations of the contaminant ions. Disposal options should be carefully considered before choosing this technology.

b When POU devices are used for compliance, programs for long-term operation, maintenance, and monitoring must be provided by water utility to ensure proper performance.

c Reject water disposal options should be carefully considered before choosing this technology. See other RO limitations described in the SWTR Compliance Technologies Table.

d The combination of variable source water quality and the complexity of the water chemistry involved may make this technology too complex for small surface water systems.

e Removal efficiencies can vary depending on water quality.

f This technology may be very limited in application to small systems. Since the process requires static mixing, detention basins, and filtration, it is most applicable to systems with sufficiently high sulfate levels that already have a suitable filtration treatment train in place.

g This technology is most applicable to small systems that already have filtration in place.

h Handling of chemicals required during regeneration and pH adjustment may be too difficult for small systems without an adequately trained operator.

i Assumes modification to a coagulation/filtration process already in place.

Table 200.14 COMPLIANCE TECHNOLOGIES BY SYSTEM SIZE CATEGORY FOR RADIONUCLIDES

#	Contaminant	Compliance Technologies[1] for systems size categories (population served)		
		25-500	501-3,300	3,300-10,000
1	Combined radium-226 and radium-228	1, 2, 3, 4, 5, 6, 7, 8, 9	1, 2, 3, 4, 5, 6, 7, 8, 9	1, 2, 3, 4, 5, 6, 7, 8, 9
2	Gross alpha particle activity	3, 4	3, 4	3, 4
3	Beta particle activity and photon activity	1, 2, 3, 4	1, 2, 3, 4	1, 2, 3, 4
4	Uranium	1, 2, 4, 10, 11	1, 2, 3, 4, 5,10,11	1, 2, 3, 4, 5, 10, 11

NOTE: [1]Numbers correspond to those technologies found listed in the Table 200.13 of this section.

§ 210 Reserved

Part III
SANITARY SURVEYS

§301 PURPOSE

Sanitary surveys, or on-site inspections, are conducted to evaluate public water systems for delivery of safe drinking water by assessing operation and maintenance practices, providing technical assistance, and determining compliance with the NNSDWA and the NNPDWR.

§302 GUIDELINES FOR SANITARY SURVEYS

Sanitary surveys, or on-site inspections, will be performed by the PWSSP, in accordance with the United States Environmental Protection Agency, Region 9's *Conducting Sanitary Surveys of Public Water Systems Guidance*.

§303 Sanitary Surveys for Groundwater Systems

A. Groundwater systems must provide the Director, at his/her request, any existing information that will enable the Director to conduct a sanitary survey.

B. For the purposes of this part, a "sanitary survey" as conducted by the Director, includes but is not limited to, an onsite review of the water source(s) (identifying sources of contamination by using results of source water assessments or other relevant information, where available), facilities, equipment, operation, maintenance, and monitoring compliance of a public water system to evaluate the adequacy of the system, its sources, and operations and the distribution of safe drinking water.

C. The sanitary survey must include an evaluation of the applicable components listed in paragraphs (C)(1) through (8) of this section:

1. Source,
2. Treatment,
3. Distribution system,
4. Finished water storage,
5. Pumps, pump facilities, and controls,
6. Monitoring, reporting, and data verification,
7. System management and operation, and
8. Operator compliance with PWSSP requirements.

§ 304 SCHEDULING OF SANITARY SURVEYS

A. The PWSSP will schedule surveys of all public water systems, as follows:

1. Each public water system that utilizes a groundwater source(s) will be surveyed, or inspected, on a two to five year frequency based on the compliance status.

2. Every surface water treatment plant will be inspected on an annual basis. The distribution system extending from the treatment plant will be inspected on a two to five year frequency.

3. Every public water system that utilizes unfiltered Groundwater Under the Direct Influence of Surface Water will be inspected annually.

   a. The public water system must be subject to an annual on-site inspection to assess the watershed control program and disinfection treatment process. Either the Director or a person approved by the Director must conduct the on-site inspection. The inspection must be conducted by competent individuals such as sanitary and civil engineers, sanitarians, or technicians who have experience and knowledge about the operation and maintenance of a public water system, and who have a sound understanding of public health principles and waterborne diseases. A report of the on-site inspection summarizing all findings must be prepared every year and forwarded to the Director. The on-site inspection must indicate to the Director's satisfaction that the watershed control program and disinfection treatment process are adequately designed and maintained. The on-site inspection must include:

      i. A review of the effectiveness of the watershed control program;

      ii. A review of the physical condition of the source intake and how well it is protected;

      iii. A review of the public water system's equipment maintenance program to ensure there is low probability for failure of the disinfection process;

iv. An inspection of the disinfection equipment for physical deterioration;

v. A review of operating procedures;

vi. A review of data records to ensure that all required tests are being conducted and recorded and disinfection is effectively practiced; and

vii. Identification of any improvements which are needed in the equipment, public water system maintenance and operation, or data collection.

4. Consecutive water systems will be inspected on a two to five year basis.

5. TNCWSs using only protected and disinfected ground water, as defined by the Director, must undergo subsequent sanitary surveys at least every ten years after the initial sanitary survey. The Director must review the results of each sanitary survey to determine whether the existing monitoring frequency is adequate and what additional measures, if any, the system needs to undertake to meet drinking water standards.

6. In conducting a sanitary survey of a system using groundwater, information on sources of contamination within the delineated wellhead protection area, pursuant to §1700 of these regulations, that was collected in the course of developing and implementing the program will be considered instead of collecting new information, if the information was collected since the last time the system was subject to a sanitary survey.

§ 305 Reporting

1. A report of findings will be sent to the owner/operator within 30 days after the inspection has been completed. The report will outline the compliance status with the NNSDWA and the NNPDWR and any other deficiencies pertaining to the infrastructure, operation, and maintenance that may affect the delivery of safe drinking water. A courtesy copy will be forwarded to persons who participated in the sanitary survey.

2. The owner/operator shall respond to the report of findings and submit a compliance schedule that addresses each deficiency within 45 days after the date of inspection.

§ 306 INSPECTIONS OF NONCOMPLYING PUBLIC WATER SYSTEMS

A. Public water systems that have been determined by the PWSSP to be in noncompliance will be inspected annually, or more frequently as needed, to bring the system into compliance.

B. The PWSSP will conduct follow-up inspections of systems in noncompliance. PWSSP will provide technical assistance to owners/operators in order to achieve compliance.

PART IV
SAMPLING AND ANALYTICAL REQUIREMENTS

§ 401 PURPOSE

The purpose of this part is to ensure that all sampling and analytical requirements are consistent with the NNSDWA and the NNPDWR. A monitoring schedule may be prepared by the Navajo PWSSP staff for use by the public water system owner/operator to ensure compliance with the monitoring requirements.

NOTE: Analytical methodologies for each contaminant group are listed in Appendix A.

§ 402 CERTIFIED LABORATORIES

A. For the purpose of determining compliance with §§ 404 through 415, Appendix A, C, and D, samples may be considered only if they have been analyzed by a laboratory approved by the EPA, except that measurements for alkalinity, calcium, conductivity, disinfectant residual, orthophosphate, pH, silica, temperature and turbidity may be performed by any person acceptable to the EPA.

B. Nothing in these regulations shall be construed to preclude the Director or authorized representative(s) from taking samples or from using the results from such samples to determine compliance by a public water system owner or operator with applicable requirements of these regulations.

§ 403 SITE-SAMPLING PLAN REQUIREMENTS

All public water systems must collect total coliform samples at sites which are representative of water throughout the distribution system according to a written site-sampling plan. These site-sampling plans are subject to NNEPA review and approval. Public water systems must update their existing site-sampling plans upon promulgation of these regulations and every two years thereafter.

§ 404 MICROBIOLOGICAL SAMPLING AND ANALYTICAL REQUIREMENTS

This section describes the total coliform sampling and analytical requirements for all types of public water systems.

A. ROUTINE SAMPLING

1. The monitoring frequency for total coliforms for public water systems is based on the population served by the system, see Table 400.1.

TABLE 400.1 MINIMUM NUMBER OF TOTAL COLIFORM SAMPLES BASED ON POPULATION

POPULATION SERVED	MINIMUM NUMBER OF SAMPLES PER MONTH	POPULATION SERVED	MINIMUM NUMBER OF SAMPLES PER MONTH
25 to 1,000[1]	1	59,001 to 70,000	70
1,001 to 2,500	2	70,001 to 83,000	80
2,501 to 3,300	3	83,001 to 96,000	90
3,301 to 4,100	4	96,001 to 130,000	100
4,101 to 4,900	5	130.001 to 220,000	120
4,901 to 5,800	6	220,001 to 320,000	150
5,801 to 6,700	7	320,001 to 450,000	180
6,701 to 7,600	8	450,001 to 600,000	210
7,601 to 8,500	9	600,001 to 780,000	240
8,501 to 12,900	10	780,001 to 970,000	270
12,901 to 17,200	15	970,001 to 1,230,000	300
17,201 to 21,500	20	1,230,001 to 1,520,000	330
21,501 to 25,000	25	1,520,001 to 1,850,000	360
25,001 to 33,000	30	1,850,001 to 2,270,000	390
33,001 to 41,000	40	2,270,001 to 3,020,000	420
41,001 to 50,000	50	3,020,001 to 3,960,000	450
50,001 to 59,000	60	3,960,001 or more	480

[1]Includes public water systems which have at least 15 service connections, but serve fewer than 25 persons.

2. All public water systems must collect samples at regular time intervals throughout the month.

   a. Systems that use groundwater and serve 4,900 persons or fewer may collect all required samples on a single day only if they are taken from different sites.

   b. Systems serving 4,901 persons or more shall not collect all required samples on a single day.

   c. Systems that use Groundwater Under the Direct Influence of Surface Water shall not collect all required samples on a single day.

3. This subsection applies to a public water system that uses surface water or ground water under the direct influence of surface water and does not practice filtration in compliance with Part VIII - General Requirements for Surface Water Treatment.

   a. Each day the turbidity level of the source water exceeds 1 NTU, as specified in Appendix D § 801-D(C)(2), the system must collect at least one sample to be analyzed for the presence of total coliforms:

      i. The sample shall be collected near the first service connection.

      ii. The system shall collect this coliform sample within 24 hours of the first turbidity level exceedance.

   b. If the public water system, for logistical reasons outside the system's control, cannot have the sample analyzed within 30 hours of collection, the owner/operator shall contact the Director and request for a time extension.

   c. Sample results from this coliform sampling shall be included in determining compliance with the MCL for total coliforms in § 205.

4. The monitoring frequency for total coliforms for non-community water systems is as follows:

   a. A non-community water system using only ground water (except GWUDI) and serving 1,000 persons or fewer must monitor each calendar quarter that the system provides water to the public, except that the Director may reduce this monitoring frequency, in writing, if a sanitary survey shows that the system is free of sanitary defects.

      The Director cannot reduce the monitoring frequency for a non-community water system using only ground water (except GWUDI) and serving 1,000 persons or fewer to less than once/year.

   b. A non-community water system using only ground water (except GWUDI) and serving more than 1,000 persons during any month must monitor at the same frequency as a like-sized community water system, as specified in subsection (A)(1) of this section, except the Director may reduce this monitoring frequency, in writing, for any month the system serves 1,000 persons or fewer.

      The Director cannot reduce the monitoring frequency to less than once/year.

   c. A non-community water system using surface water, in total or in part, must monitor at the same frequency as a like-sized CWS as specified in subsection (A)(1) of this section, regardless of the number of persons it serves.

   d. A non-community water system using ground water under the direct influence of surface water, as defined in §104, must monitor at the same frequency as a like-sized CWS as specified in subsection (A)(1) of this section. The system must begin monitoring at this frequency beginning six months after the Director determines that the ground water is under the direct influence of surface water.

6. Special purpose samples, such as those taken to determine whether disinfection practices are sufficient following pipe placement, replacement, or repair, shall not be used to determine compliance with the MCL for total coliforms in § 205.

7. Repeat samples taken pursuant to subsection (B) of this section are not considered special purpose samples, and must be used to determine compliance with the MCL for total coliforms in § 205.

B. REPEAT SAMPLING

1. If a routine sample is total coliform-positive, the public water system must collect a set of repeat samples within 24 hours of being notified of the positive result.

   The Director may extend the 24-hour limit, on a case-by-case basis, if the system has a logistical problem in collecting the repeat samples within 24 hours that is beyond its control. In the case of an extension, the Director must specify how much time the system has to collect the repeat samples.

   a. Public water systems which collect two or more routine samples per month must collect a minimum of three repeat samples for each total coliform-positive sample found.

   b. Public water systems which collect one routine sample per month or fewer must collect a minimum of four repeat samples for each total coliform-positive found.

2. The system must collect at least one repeat sample from:

   a. the sampling tap where the original total coliform-positive sample was taken; and

   b. at least one repeat sample at a tap within five service connections upstream of the original sampling site; and

   c. at least one repeat sample at a sampling tap within five service connections downstream of the original sampling site.

   If a total coliform-positive sample is at the beginning or end of the distribution system, the owner/operator shall notify the Director. Upon notification, the Director will designate other sampling points to satisfy the number of repeat sample requirements.

3. Public water systems must collect all repeat samples on the same day.

   a. Except with the Director's approval, public water systems with a single service connection may collect:

      i. repeat samples each day for four consecutive days to meet the number of repeat sample requirements; or

      ii. a larger volume repeat sample(s) in one or more sample containers of any size, as long as the total volume collected is at least to 400 ml (300 ml for systems which collect more than one routine sample per month).

4. If one or more repeat samples in one set is total coliform-positive, the public water system must collect an additional set of repeat samples in the manner specified in subsections (B)(1) through (3) of this section.

   a. The additional samples must be collected within 24 hours of being notified of the positive result, unless the Director extends the limit as provided in subsection (B)(1) of this section.

   b. The water system must repeat this process until:

      i. either total coliforms are not detected in one complete set of repeat samples; or

      ii. the system determines that the MCL for total coliforms in § 205 has been exceeded and notifies the Director.

5. If a system collecting less than five routine samples per month has one or more total coliform-positive samples and the Director does not invalidate the sample(s) under subsection (D) of this section, then the water system must collect at least five routine samples during the next month the system provides water to the public.

   The Director may waive this requirement if (a) or (b) below are met:

   a. The Director may waive the requirement to collect five routine samples if the PWSSP performs a site visit before the end of the next month the system provides water to the public. Although a sanitary survey need not be performed, the site visit

must be sufficiently detailed to allow the Director to determine whether additional monitoring and/or any corrective action is needed. The Director cannot approve an employee of the public water system to perform this site visit, even if the employee is an agent approved by the Director to perform sanitary surveys; or

b. The Director may waive the requirement to collect five routine samples if the Director has determined why the sample was total coliform-positive and establishes that the system has corrected the problem or will correct the problem before the end of the next month the system serves water to the public.

i. The Director must document this decision to waive the following month's additional monitoring requirement in writing and make this document available to the EPA and the public.

ii. The written documentation must describe the specific cause of the total coliform-positive sample and what action the system has taken, and/or will take, to correct this problem.

iii. The Director cannot waive the requirement to collect five routine samples the next month the system provides water to the public solely on the grounds that all repeat samples are total coliform-negative.

iv. Under this subsection, a system must still take at least one routine sample before the end of the next month it serves water to the public and use it to determine compliance with the MCL for total coliforms in § 205, unless the Director has determined that the system has corrected the contamination problem before the system took the set of repeat samples required in subsections (B)(1) through (4) of this section, and all repeat samples were total coliform-negative.

c. The Director cannot waive the requirement for a system to collect repeat samples in subsections (B)(1) through (4) of this section.

6. After a system collects a routine sample and before it learns the results of the analysis of that sample, if it collects another routine sample(s) from within five adjacent service connections of the initial sample, and the initial sample, after analysis, is found to contain total coliforms, then the system may count the subsequent sample(s) as a repeat sample instead of as a routine sample.

7. Results of all routine and repeat samples not invalidated by the Director must be included in determining compliance with the MCL for total coliforms in § 205.

C. REDUCED MONITORING

If a community water system serving 25 to 1,000 persons has no history of total coliform contamination in its current configuration and a sanitary survey conducted in the past five years shows that the system is supplied solely by a protected groundwater source and is free of sanitary defects, the Director may reduce the monitoring frequency to less than one sample per quarter. The Director must approve the reduced monitoring frequency in writing.

D. INVALIDATION OF TOTAL COLIFORM SAMPLES

A total coliform-positive sample invalidated under this subsection (D) does not count towards meeting the minimum sampling requirements of this section.

1. The Director may invalidate a total coliform-positive sample only if the following conditions are met:

a. The laboratory establishes that improper sample analysis caused the total coliform-positive result; or

b. The Director, on the basis of the results of repeat samples collected as required by subsections (B)(1) through (4) of this section, determines that the total coliform-positive sample resulted from a domestic or other non-distribution system plumbing problem. The Director cannot invalidate a sample on the basis of a repeat sample result unless all repeat sample(s) collected at the same tap as the original total coliform-positive sample are also total coliform-positive, and all repeat samples collected within five service connections of the original tap are total

coliform-negative (e.g., the Director cannot invalidate a total coliform-positive sample on the basis of repeat samples if all the repeat samples are total coliform-negative, or if the public water system has only one service connection); or

c. The Director has substantial grounds to believe that a total coliform-positive result is due to a circumstance or condition which does not reflect water quality in the distribution system. In this case, the system must still collect all repeat samples required under subsections (B)(1) through (4) of this section, and use them to determine compliance with the MCL for total coliforms in § 205.

i. To invalidate a total coliform-positive sample under this subsection, the decision with the rationale for the decision must be documented in writing, approved and signed by the Director.

ii. The Director shall make this document available to EPA and the public.

iii. The written documentation must state the specific cause of the total coliform-positive sample, and what action the system has taken, or will take, to correct this problem.

iv. The Director may not invalidate a total coliform-positive sample solely on the grounds that all repeat samples are total coliform-negative.

2. A laboratory must invalidate a total coliform sample (unless total coliforms are detected) if the sample;

a. produces a turbid culture in the absence of gas production using an analytical method where gas formation is examined (e.g., the Multiple-Tube-Fermentation Technique); or

b. produces a turbid culture in the absence of an acid reaction in the Presence-Absence (P-A) Coliform Test; or

c. exhibits confluent growth with an analytical method using a membrane filter (e.g., Membrane Filter Technique); or

d. produces colonies too numerous to count with an analytical method using a membrane filter (e.g., Membrane Filter Technique).

If a laboratory invalidates a sample due to (a) through (d) of the above, then the system must collect another sample from the original sample location within 24 hours of being notified of the interference problem, and have it analyzed for the presence of total coliforms. The system must continue to resample within 24 hours and have the samples analyzed until it obtains a valid result. The Director may waive the 24-hour time limit on a case-by-case basis.

E. FECAL COLIFORMS/*ESCHERICHIA coli (E.coli)* TESTING

1. If any routine or repeat sample is total coliform-positive, the system must analyze the same total coliform-positive culture medium to determine if fecal coliforms are present, or the system may test for *E. coli* in lieu of fecal coliforms.

If fecal coliforms or *E. coli* are present, the system must notify the Director by the end of the business day when the system is notified of the test result, unless the system is notified of the result after the Director's office is closed, in which case the system must notify the Director before the end of the next business day.

2. The Director has the discretion to allow a public water system, on a case-by-case basis, to forgo fecal coliform or *E. coli* testing on a total coliform-positive sample if that system assumes that the total coliform-positive sample is fecal coliform-positive or *E. coli*-positive. Accordingly, the system must notify the Director as specified in subsection (E)(1) of this section and the provisions of § 205 shall apply.

F. RESPONSE TO VIOLATION

1. A public water system which has exceeded the MCL for total coliforms and other microbiological contaminants in § 205 must report the violation to the Director no later

than the end of the next business day after learning of the violation, and must notify the public in accordance with § 604.

2. A public water system which has failed to comply with a coliform sampling requirement, including the sanitary survey requirement, must report the sampling violation to the Director within ten days after the system discovers the violation, and must notify the public in accordance with § 604.

§ 405 SAMPLING AND ANALYTICAL REQUIREMENTS FOR INORGANIC CHEMICALS

CWSs and NTNCWSs shall conduct sampling and analyses to determine compliance with the MCLs (antimony, arsenic, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, selenium and thallium) specified in § 203 in accordance with this section.

Each public water system shall sample at the time designated by the Director during each three-year compliance period.

A. Sampling and analyses shall be conducted as follows:

1. Groundwater systems shall take a minimum of one sample at every entry point to the distribution system which is representative of each well after treatment and have the sample(s) analyzed. The system shall take each sample at the same sampling point unless conditions make another sampling point more representative of each source or treatment plant.

2. Surface water systems shall take a minimum of one sample at every entry point to the distribution system after any application of treatment or in the distribution system at a point which is representative of each source after treatment and have the sample(s) analyzed. The system shall take each sample at the same sampling point unless conditions make another sampling point more representative of each source or treatment plant.

   NOTE: For purposes of this subsection surface water systems include systems with a combination of surface and groundwater sources.

3. If a system draws water from more than one source and the sources are combined before entering the distribution system, the system must obtain a sample at an entry point to the distribution system during periods of normal operation (i.e., all the sources are in use and ample time is allowed for water from the furthest source to reach the sampling point).

B. The frequency of sampling and analyses conducted to determine compliance with the MCLs specified in § 203 for antimony, arsenic, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, selenium and thallium shall be as follows:

1. Groundwater systems shall take one sample at each sampling point once every three years. Surface water systems, combined surface/ground water systems or GWUDI shall take one sample annually at each sampling point.

2. All new systems or systems that use a new source of water and that will begin operation after January 22, 2004 must demonstrate compliance with the arsenic MCL within a period of time specified by the Director. The system must also comply with the initial sampling frequencies specified by the Director to ensure a system can demonstrate compliance with the arsenic MCL. Routine and increased monitoring frequencies shall be conducted in accordance with the requirements in this section.

C. Composite Samples for Inorganic Chemicals:

Composite samples from a maximum of five samples is allowed, provided that the public water system notify the Director in writing and that the detection limit of the method used for analysis is less than one-fifth of the MCL. Detection limits for each analytical method and MCLs for each inorganic contaminant are listed in Appendix A, Table 400-A-2. Compositing of samples must be done in the laboratory.

1. If the concentration in the composite sample is greater than or equal to one-fifth of the MCL of any inorganic chemical, then a follow-up sample must be taken within 14 days at each sampling point included in the composite. These samples must be analyzed for the contaminants which exceeded one-fifth of the MCL in the composite sample.

2. If the population served by the system is greater than 3,300 persons, then compositing may only be allowed by the Director at sampling points within a single system.

In systems serving less than or equal to 3,300 persons, compositing may be allowed among different systems provided that the 5-sample limit is maintained.

3. If duplicates of the original sample taken from each sampling point used in the composite are available, then the system may use the duplicates instead of resampling. The duplicates must be analyzed and the results reported to the Director within 14 days after completing analysis of the composite sample, provided the holding time of the sample is not exceeded.

D. Confirmation Samples:

1. If analytical results indicate an exceedance of the MCL for antimony, arsenic, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, selenium or thallium:

   a. The public water system must collect one sample as soon as possible after the initial sample was taken (but not to exceed two weeks) at the same sampling point.

E. Compliance with the MCLs listed in § 203 shall be determined based on analytical result(s) obtained at each sampling point.

1. For public water systems which collect more than one sample per year, compliance with the MCLs for antimony, arsenic, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, selenium or thallium is determined by a running annual average at any sampling point.

   a. If the average at any sampling point is greater than the MCL, then the system is out of compliance.

   b. If any one sample would cause the annual average to be exceeded, then the system is out of compliance immediately.

   c. Any sample below the method detection limit shall be calculated as zero for the purpose of determining the annual average.

   d. If a system fails to collect the required number of samples, compliance (average concentration) will be based on the total number of samples collected.

2. For public water systems which are sampling annually, or less frequently, the system is out of compliance with the MCLs for antimony, arsenic, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, selenium, or thallium if the level of a contaminant at any sampling point is greater than the MCL. If a confirmation sample is required by the Director, the determination of compliance will be based on the average of the two samples. If a public water system fails to collect the required number of samples, compliance (average concentration) will be based on the total number of samples collected.

   a. Arsenic sampling results will be reported to the nearest 0.001 mg/L

3. If a public water system has a distribution system separable from other parts of the distribution system with no interconnections, the Director may allow the public water system to give public notice to only the area served by that portion of the distribution system which is out of compliance.

F. Response to Violations of the MCL for Inorganic Chemicals

1. Compliance with the MCLs listed in § 203 shall be determined based on analytical result(s) obtained at each sampling point as required in subsection (E) of this section.

2. The Director has the authority to determine compliance or initiate enforcement action based upon analytical results and other information compiled by his/her authorized representative(s).

3. If the result of an analysis indicates that the level of arsenic listed in § 203 exceeds the MCL, then;

   a. the public water system owner or operator shall report to the Director within seven days, and

   b. initiate three additional analyses at the same sampling point within one month.

4. When the average of four analyses made, pursuant to subsection (3) of this section, rounded to the same number of significant figures as the MCL for arsenic exceeds the MCL, the water system owner or operator shall:

   a. notify the Director pursuant to § 502; and

   b. give notice to the public pursuant to § 603.

   Sampling after public notification shall be at a frequency designated by the Director and shall continue until the MCL has not been exceeded in two successive samples or until a sampling schedule as a condition to a variance, exemption or enforcement action shall become effective.

G. Waivers

1. The system may apply to the Director, in writing, for a waiver from the sampling frequencies specified in subsection (B)(1) of this section.

   a. The Director may grant a public water system a waiver for sampling of "free" cyanide, provided that the Director determines that the water system is not vulnerable due to lack of any industrial source of cyanide.

2. A condition of the waiver shall require that a public water system take a minimum of one sample while the waiver is effective. The term during which the waiver is effective shall not exceed one nine-year compliance cycle.

3. The Director may grant a waiver provided surface water systems have sampled annually for at least three years and groundwater systems have conducted a minimum of three rounds of sampling. Both surface and groundwater systems shall demonstrate that all previous analytical results were below the MCL.

4. Systems that use a new water source are not eligible for a waiver until three rounds of sampling from the new source have been completed.

5. In determining the appropriate reduced sampling frequency, the Director shall consider:

   a. Reported concentrations from all previous sampling;

   b. The degree of variation in reported concentrations; and

   c. Other factors which may affect contaminant concentrations such as changes in groundwater pumping rates, changes in the system's configuration, changes in the system's operating procedures, or changes in stream flows or characteristics.

6. A decision by the Director to grant a waiver shall be made in writing and shall set forth the basis for the determination. The public water system shall specify the basis for its request. The Director shall review and, where appropriate, revise its determination of the appropriate sampling frequency when the system submits new sampling data or when other data relevant to the system's appropriate sampling frequency become available.

7. Systems which exceed the MCLs as calculated in subsection (E)(1) of this section shall sample quarterly beginning in the next quarter after the violation occurred.

8. The Director may decrease the quarterly sampling requirement to the frequencies specified in subsections (B)(1) and (G)(1) of this section provided that the system is reliably and consistently below the MCL. In no case can the Director make this determination unless a groundwater system takes a minimum of two quarterly samples and a surface water system takes a minimum of four quarterly samples.

§ 406 SAMPLING AND ANALYTICAL REQUIREMENTS FOR ASBESTOS

A. Sampling and analyses shall be conducted as follows:

The frequency of sampling conducted to determine compliance with the MCL for asbestos specified in § 203 shall be conducted as follows:

1. Each CWS and NTNCWS is required to sample for asbestos during the first three-year compliance

period of each nine-year compliance cycle.

B. Confirmation Sampling for Asbestos

1. If the initial sample exceeds the MCL for asbestos, then the public water system must collect a confirmation sample immediately after the initial asbestos sample was taken (but not to exceed two weeks) at the same sampling point.

C. Compliance with the MCL for Asbestos

1. For public water systems which collect more than one sample per year, compliance with the MCLs for asbestos is determined by a running annual average at any sampling point.

   a. If the average at any sampling point is greater than the MCL, then the system is out of compliance.

   b. If any one sample would cause the annual average to be exceeded, then the system is out of compliance immediately.

   c. Any sample below the detection limit shall be calculated as zero for the purpose of determining the annual average.

   d. If a system fails to collect the required number of samples, compliance (average concentration) will be based on the total number of samples collected.

2. For systems which are sampling annually, or less frequently, the system is out of compliance with the MCLs for asbestos if the level of the contaminant at any sampling point is greater than the MCL. If a confirmation sample is required by the Director, the determination of compliance will be based on the average of the two samples. If a public water system fails to collect the required number of samples, compliance (average concentration) will be based on the total number of samples collected.

3. If a public water system has a distribution system separable from other parts of the distribution system with no interconnections, the Director may allow the system to give public notice to only the area served by that portion of the system which is out of compliance.

D. Response to Violations of the MCL for Asbestos

1. A system which exceeds the MCLs as determined in subsection (C) of this section shall sample quarterly beginning in the next quarter after the violation occurred.

2. The Director may decrease the quarterly sampling requirement to the frequency specified in subsection (A) of this section provided the Director has determined that the system is reliably and consistently below the MCL. In no case can the Director make this determination unless a groundwater system takes a minimum of two quarterly samples and a surface (or combined surface/ground) water system takes a minimum of four quarterly samples.

3. The Director has the authority to determine compliance or initiate enforcement action based upon analytical results and other information compiled by his/her authorized representative(s).

E. Waivers

1. The public water system may apply to the Director to waive the asbestos requirement based on the following conditions;

   a. the system is not vulnerable to asbestos contamination in its source water; and/or

   b. contamination due to corrosion of asbestos-cement pipe(s).

2. If the Director grants the waiver, then the system is not required to sample during that specified nine-year compliance cycle. A waiver remains in effect until the completion of the nine-year compliance cycle.

   a. Systems not receiving a waiver must sample and analyze in accordance with the provisions of subsection (A) of this section.

3. A system vulnerable to asbestos contamination due solely to corrosion of asbestos-cement

pipe shall take one sample at a tap served by asbestos-cement pipe and where asbestos contamination is most likely to occur.

4. A system vulnerable to asbestos contamination due solely to source water shall sample in accordance with the provisions of subsection (A) of this section.

5. A system vulnerable to asbestos contamination due to both its source water supply and corrosion of asbestos-cement pipe shall take one sample at a tap served by asbestos-cement pipe and where asbestos contamination is most likely to occur.

§ 407 SAMPLING AND ANALYTICAL REQUIREMENTS FOR NITRATE

All public water systems shall collect a sample at each entry point to the distribution system after treatment to determine compliance with the MCL for nitrate in § 203.

A. Sampling and analyses shall be conducted as follows:

1. All public water systems served by groundwater systems shall sample annually. Surface water systems, combined surface and groundwater systems, or GWUDI shall take one sample quarterly.

2. For all public water systems, the repeat sampling frequency for groundwater systems shall be quarterly for at least one year following any one sample in which the concentration is greater than or equal to fifty percent (≥50%) of the MCL. The Director may allow a groundwater system to reduce the sampling frequency to annually after four consecutive quarterly samples are reliably and consistently below the MCL.

3. For CWSs and NTNCWSs, the Director may allow a surface water system, combined surface and groundwater systems, or GWUDI to reduce the sampling frequency to annually if all analytical results from four consecutive quarters are less than fifty percent (<50 %) of the MCL. A surface water system shall return to quarterly sampling if any one sample is ≥50 % of the MCL.

4. After the completed round of quarterly sampling, each CWS and NTNCWS which is sampling annually shall take subsequent samples during the quarter(s) which previously resulted in the highest analytical result.

B. Confirmation samples for Nitrate

1. If analytical results indicate an exceedance of the MCL for Nitrate:

a. The public water system shall collect a confirmation sample within 24 hours upon notification of the analytical result(s).

b. Systems unable to comply with the 24-hour sampling requirement must:

i. immediately notify persons served by the public water system in accordance with § 603 and 604 and meet other Tier 1 public notification requirements under Part VI of these regulations; and,

ii. collect and analyze a confirmation sample within two weeks of notification of the analytical results of the first sample.

2. If a Director-required confirmation sample is taken for Nitrate, then the results of the initial and confirmation sample shall be averaged. The resulting average shall be used to determine the system's compliance in accordance with subsection (C) of this section. The Director has the discretion to delete results of obvious sampling errors.

C. Compliance with the MCL for Nitrate

1. Compliance with the MCL for nitrate is determined based on one sample, if the levels are below the MCL. If the levels of nitrate exceed the MCL in the initial sample, a confirmation sample is required and compliance shall be determined based on the average of the initial and confirmation samples.

2. If a public water system has a distribution system separable from other parts of the distribution system with no interconnections, the Director may allow the system to give public notice to only the area served by that portion of the distribution system which is out of compliance.

D. Response to Violations of the MCL for Nitrate

1. The Director may require more frequent sampling or may require confirmation samples for results that exceed the MCL.

2. The Director has the authority to determine compliance or initiate enforcement action based upon analytical results and other information compiled by the Director's authorized representative(s).

3. If the result of an analysis indicates that the level of nitrate listed in § 203 exceeds the MCL, the public water system owner or operator shall:

   a. report to the Director within seven days; and

   b. initiate three additional analyses at the same sampling point within one month.

4. When the average of four analyses made pursuant to subsection (3) of this section, rounded to the same number of significant figures as the MCL for nitrate exceeds the MCL, the public water system owner or operator shall:

   a. notify the Director pursuant to § 502; and

   b. give notice to the public pursuant to § 603.

   Sampling after public notification shall be at a frequency designated by the Director and shall continue until the MCL has not been exceeded in two successive samples or until a sampling schedule as a condition to a variance, exemption or enforcement action shall become effective.

5. The provisions of subsections (3) and (4) of this section notwithstanding, compliance with the MCL for nitrate shall be determined on the basis of the mean of two analyses. When a level exceeding the MCL for nitrate is found, a second analysis shall be initiated within twenty-four hours, and if the mean of the two analyses exceeds the MCL, the public water system owner or operator shall report the findings to the Director pursuant to § 502 and shall notify the public pursuant to § 603.

E. Waivers

There are no waivers of the nitrate sampling requirements.

§ 408 SAMPLING AND ANALYTICAL REQUIREMENTS FOR NITRITE

All public water systems shall sample to determine compliance with the MCL for nitrite in § 203.

A. Sampling and analyses shall be conducted as follows:

1. All public water systems served by groundwater shall sample at a frequency specified by the Director. Surface water systems, combined surface and groundwater systems, or GWUDI shall take one sample annually.

2. All public water systems shall take one sample at each entry point to the distribution system after treatment.

B. Confirmation samples for Nitrite

1. If analytical results indicate an exceedance of the MCL for Nitrite:

   a. The public water system must collect a confirmation sample within 24 hours upon receiving the analytical result(s).

   b. Systems unable to comply with the 24-hour sampling requirement must:

      i. immediately notify persons served by the public water system in accordance with § 605 and 606 and meet other Tier 1 public notification requirements under Part VI of these regulations; and,

      ii. collect and analyze a confirmation sample within two weeks of notification

of the analytical results.

C. Compliance with the MCL for Nitrite

1. Compliance with the MCL for nitrite is determined based on one sample, if the levels are below the MCL. If the levels of nitrite exceed the MCL in the initial sample, a confirmation sample is required and compliance shall be determined based on the average of the initial and confirmation samples.

2. All public water systems where an analytical result for nitrite is <50 % of the MCL shall sample at the frequency specified by the Director.

3. The repeat sampling frequency for any public water system whose concentration is ≥50 % of the MCL, shall sample quarterly for at least one year. The Director may allow a system to reduce the sampling frequency to annually after determining the system is reliably and consistently below the MCL.

4. Public water systems which are sampling annually shall take each subsequent sample during the quarter(s) which previously resulted in the highest analytical result.

5. If a public water system has a distribution system separable from other parts of the distribution system with no interconnections, the Director may allow the system to give public notice to only the area served by that portion of the distribution system which is out of compliance.

D. Response to Violations of the MCL for Nitrite

1. The Director may require more frequent sampling or may require confirmation samples for results that exceed the MCL.

2. The Director has the authority to determine compliance or initiate enforcement action based upon analytical results and other information compiled by the Director's authorized representative(s).

E. Waivers

There shall be no waivers of the nitrite sampling requirements.

§ 409 SAMPLING AND ANALYTICAL REQUIREMENTS FOR VOLATILE ORGANIC CHEMICALS

CWSs and NTNCWSs shall conduct sampling and analyses to determine compliance with the MCLs listed in § 204, Table 200.3 (1) through (21), in accordance with this section.

Each public water system shall sample at the time designated by the Director during each three-year compliance period.

A. Sampling and analyses shall be conducted as follows:

1. Groundwater systems shall take a minimum of one sample at every entry point to the distribution system after treatment and have the samples analyzed (hereafter called a sampling point). Each sample must be taken at the same sampling point unless conditions make another sampling point more representative of each source, or treatment plant within the distribution system.

2. Surface water systems, or water systems using a combination of surface/ground or GWUDI, shall take a minimum of one sample at each entry point to the distribution system after treatment and have the samples analyzed.

   Each sample must be taken at the same sampling point unless conditions make another sampling point more representative of each source, or treatment plant within the distribution system.

3. If a system draws water from more than one source and the sources are combined before entering the distribution system, the system must obtain a sample at an entry point to the distribution system during periods of normal operation (i.e., all the sources are in use and ample time is allowed for water from the furthest source to reach the sampling point).

4. Each CWS and NTNCWS shall take four consecutive quarterly samples for each contaminant listed in § 204, Table 200.3 (2) through (21) during each three-year compliance period.

5. If the initial sampling for contaminants listed in § 204, Table 200.3 (1) through (21) have been conducted and the systems did not detect any contaminant listed in Table 200.3 (1) through (21), then each ground and surface water system shall take one sample annually beginning with the initial three-year compliance period.

6. After a minimum of three years of annual sampling, the Director may allow groundwater systems with no previous detection of any contaminant listed in § 204, Table 200.3 to take one sample during each three-year compliance period.

7. The Director may reduce the total number of samples a system must analyze by allowing the use of compositing. Composite samples from a maximum of five sampling points are allowed, provided that the detection limit of the method used for analysis is less than one-fifth of the MCL. Compositing of samples must be done in the laboratory and analyzed within 14 days of sample collection.

   a. If the concentration in the composite sample is greater than or equal to 0.0005 mg/L for any contaminant listed in § 204, Table 200.3 (1) through (21) then a follow-up sample must be taken and analyzed within 14 days from each sampling point included in the composite, and be analyzed for that contaminant.

   b. If duplicates of the original sample taken from each sampling point used in the composite are available, the system may use these instead of resampling. The duplicate must be analyzed and the results reported to the Director within 14 days after completing analysis of the composite sample, provided the holding time of the sample is not exceeded.

   c. If the population served by the system is > 3,300 persons, then compositing may only be permitted by the Director at sampling points within a single system. In systems serving ≤ 3,300 persons, the Director may permit compositing among different systems provided the 5-sample limit is maintained.

B. Confirmation samples for Volatile Organic Chemicals

1. The Director may require a confirmation sample for positive or negative results. If a confirmation sample is required by the Director, the result must be averaged with the first sampling result and the average is used for the compliance determination as specified in subsection (D) of this section. The Director will delete the results of obvious sampling errors from this calculation.

C. Detection Limits for Volatile Organic Chemicals

1. If a contaminant listed in Table 200.3 (2) through (21) is detected at a level exceeding 0.0005 mg/L in any sample, then:

   a. The system must sample quarterly at each sampling point which resulted in a detection.

   b. The Director may decrease the quarterly sampling requirement specified in subsection (C)(1)(a) of this section provided it has determined that the system is reliably and consistently below the MCL. In no case shall the Director make this determination unless a groundwater system takes a minimum of two quarterly samples and a surface water system takes a minimum of four quarterly samples.

   c. If the Director determines that the system is reliably and consistently below the MCL, the Director may allow the system to sample annually. Systems which sample annually must sample during the quarter(s) which previously yielded the highest analytical result.

   d. Systems which have three consecutive annual samples with no detection of a contaminant may apply to the Director for a waiver as specified in subsection (F)(2) of this section.

   e. Groundwater systems which have detected one or more of the following two-carbon organic compounds:

      i. trichloroethylene, tetrachloroethylene, 1,2-dichloroethane, 1,1,1-trichloroethane, cis-1,2-dichloroethylene, trans-1,2-dichloroethylene, or 1,1-dichloroethylene, shall sample quarterly

for vinyl chloride.

ii. A vinyl chloride sample shall be taken at each sampling point at which one or more of the two-carbon organic compounds was detected. If the results of the first analysis do not detect vinyl chloride, the Director may reduce the quarterly sampling frequency of vinyl chloride sampling to one sample during each three-year compliance period.

iii. Surface water systems are required to sample for vinyl chloride as specified by the Director.

D. Compliance with § 204, Table 200.3 (1) through (21) shall be determined based on the analytical results obtained at each sampling point. If one sampling point is in violation of an MCL, the system is in violation of the MCL.

1. For public water systems which collect more than one sample per year, compliance with the MCLs listed in § 204, Table 200.3 (1) through (21) is determined by a running annual average at each sampling point.

a. Systems monitoring annually or less frequently whose sample result exceeds the MCL must begin quarterly sampling. The system will not be considered in violation of the MCL until it has completed one year of quarterly sampling.

b. If any one sample would cause the annual average to exceed the MCL, then the system is out of compliance immediately.

c. If a system fails to collect the required number of samples, compliance will be based on the total number of samples collected.

d. Any sample below the detection limit shall be calculated at zero for the purpose of determining the annual average.

2. All new systems or systems that use a new source of water that begin operation after January 22, 2004 must demonstrate compliance with the MCL within a period of time specified by the Director. The system must also comply with the initial sampling frequencies specified by the Director to ensure a system can demonstrate compliance with the MCL. Routine and increased monitoring frequencies shall be conducted in accordance with the requirements in this section.

E. Response to Violations of the MCL for Volatile Organic Chemicals

1. Systems which violate the requirements of § 204, Table 200.3 (1) through (21), as determined by subsection (D) of this section, must sample quarterly. After a minimum of four consecutive quarterly samples which show the system is in compliance as specified in subsection (D) of this section and the system and the Director determines that the system is reliably and consistently below the MCL, the system may sample at the frequency and times specified in subsection (C)(1)(c) of this section.

2. The Director may increase required sampling where necessary to detect variations within the system.

F. Waivers

1. Each CWS and NTNCWS groundwater system which does not detect a contaminant listed in § 204, Table 200.3 (1) through (21) may apply to the Director for a waiver from the requirements of subsections (A)(5) and (6) of this section after completing the initial sampling of each nine-year compliance cycle. (For the purposes of this section detection is defined as ≥ to 0.0005 mg/L.)

a. A waiver shall be effective for no more than six years (two three-year compliance periods).

b. The Director may also issue waivers to small systems for the initial round of sampling for 1,2,4-trichlorobenzene.

2. The Director may grant a waiver after evaluating a vulnerability assessment survey which includes the following factor(s):

a. Knowledge of previous use (including transport, storage, or disposal) of the contaminant(s) within the watershed or zone of influence of the system. If a determination by the Director reveals no previous use of the contaminant(s) within the watershed or zone of influence, a waiver may be granted.

b. If previous use of the contaminant(s) is unknown or has been used previously, then the following factors shall be used to determine whether a waiver is granted.

i. Previous analytical results.

ii. The proximity of the system to a potential point or non-point source(s) of contamination. Point sources include, but are not limited to, spills and leaks of chemicals at or near a water treatment facility or at manufacturing, distribution, or storage facilities, or from hazardous and municipal waste landfills and other waste handling or treatment facilities.

iii. The environmental persistence and transport of the contaminants.

iv. The number of persons served by the water system and the proximity of a smaller system to a larger system.

v. How well the water source is protected against contamination whether it is a surface or groundwater system. Groundwater systems must consider factors such as depth of the well, the type of soil, and wellhead protection. Surface water systems must consider watershed protection.

3. As a condition of the waiver a groundwater system must:

a. Take one sample at each sampling point during the time the waiver is effective (i.e. one sample during two three-year compliance periods or six years); and

b. Update its vulnerability assessment survey every three years. If and when new potential sources of contamination have been identified to impact a drinking water source, then the vulnerability assessment survey must be updated and submitted to the Director.

c. Based on this vulnerability assessment the Director must reconfirm that the system is not vulnerable.

d. If the Director does not make this reconfirmation within three years of the initial determination, then:

i. The waiver is invalidated; and

ii. The system is required to sample annually as specified in subsection (A)(5) of this section.

4. Each CWS and NTNCWS surface water system which does not detect a contaminant listed in § 204, Table 200.3 (1) through (21) may apply to the Director for a waiver from the requirements of subsection (A)(5) of this section after completing the initial sampling of each nine-year compliance cycle.

a. Composite samples from a maximum of five sampling points are allowed, provided that the detection limit of the method used for analysis is less than one-fifth of the MCL.

b. Systems meeting this criterion must be determined by the Director to be non-vulnerable based on a vulnerability assessment survey during each three-year compliance period.

c. Each system receiving a waiver shall sample at the frequency specified by the Director (if any).

5. The Director may allow the use of monitoring data collected during the previous "nine-year" compliance cycle for purposes of initial sampling compliance. If the data are generally consistent with the other requirements of this section, the Director may use these data (i.e., single sample rather than four quarterly samples) to satisfy the initial sampling requirement of subsection (A)(4) of this section. Systems which use grandfathered samples

and did not detect any contaminant(s) listed in § 204, Table 200.3 (2) through (21) shall begin sampling annually in accordance with subsection (A)(5) of this section beginning with the initial three-year compliance period.

§ 410 SAMPLING AND ANALYTICAL REQUIREMENTS FOR SYNTHETIC ORGANIC CHEMICALS

CWSs and NTNCWSs shall conduct sampling and analyses to determine compliance with the MCLs listed in Table 200.4 (1) through (33) in § 204, in accordance with this section.

Each public water system shall conduct sampling and analyses at the time designated by the Director during each three-year compliance period.

For purposes of this section, surface water systems include systems with a combination of surface and groundwater sources.

A. Sampling and analyses shall be conducted as follows:

1. Groundwater systems shall take a minimum of one sample at every entry point to the distribution system after treatment and have the sample analyzed (hereafter called a sampling point). Each sample must be taken at the same sampling point unless conditions make another sampling point more representative of each source or treatment plant.

2. Surface water systems, or water systems using a combination of surface/ground or GWUDI, shall take a minimum of one sample at each entry point to the distribution system after treatment and have the samples analyzed.

   Each sample must be taken at the same sampling point unless conditions make another sampling point more representative of each source, or treatment plant within the distribution system.

3. If a public water system draws water from more than one source and the sources are combined before entering the distribution system, the public water system must obtain a sample at an entry point to the distribution system during periods of normal operation (i.e., all the sources are in use and ample time is allowed for water from the furthest source to reach the sampling point).

4. Sampling frequency:

   a. Each CWS and NTNCWS shall take four consecutive quarterly samples for each contaminant listed in § 204 (A)(2), Table 200.4, during each three-year compliance period beginning with the nine-year compliance cycle.

   b. Public water systems serving more than 3,300 persons which do not detect a contaminant in the initial three-year compliance period, of a nine-year compliance cycle, may reduce the sampling frequency to a minimum of two quarterly samples in one year during each of the three-year compliance periods.

   c. Public water systems serving less than or equal to 3,300 persons which do not detect a contaminant in the initial three-year compliance period may reduce the sampling frequency to a minimum of one sample during each of the three-year compliance periods.

5. The Director may reduce the total number of samples a public water system must analyze by allowing the use of compositing. Composite samples from a maximum of five sampling points are allowed, provided that the detection limit of the method used for analysis is less than one-fifth of the MCL. Compositing of samples must be done in the laboratory and analyzed within 14 days of sample collection.

   a. If the concentration in the composite sample detects one or more contaminants listed in § 204 (A)(2), then a follow-up sample must be taken and analyzed within 14 days from each sampling point included in the composite, and be analyzed for that contaminant.

   b. If duplicates of the original sample taken from each sampling point used in the composite are available, the system may use these instead of resampling. The duplicate must be analyzed and the results reported to the Director within 14 days after completing analysis of the composite sample, provided the holding time of the sample is not exceeded.

   c. If the population served by the system is >3,300 persons, then compositing may only

be permitted by the Director at sampling points within a single system. In systems serving ≤3,300 persons, the Director may permit compositing among different systems provided the 5-sample limit is maintained.

6. If sampling data are generally consistent with the requirements of subsection (A) of this section, then the Director may allow systems to use that data to satisfy the sampling requirement for the initial three-year compliance period.

7. The Director may increase the required sampling frequency, where necessary, to detect variations within the system (e.g. fluctuations in concentration due to seasonal use, changes in water source).

B. Confirmation samples for Synthetic Organic Chemicals

1. The Director may require a confirmation sample for positive or negative results. If a confirmation sample is required by the Director, the result must be averaged with the first sampling result and the average used for the compliance determination as specified by subsection (D)(1) of this section. The Director has the discretion to delete results of obvious sampling errors from this calculation.

C. Detection Limits for Synthetic Organic Chemicals

1. If an organic contaminant listed in § 204 (A)(2) is detected (as defined by subsection (C)(2) of this section) in any sample, then:

a. Each system must sample quarterly at each sampling point which resulted in a detection.

b. The Director may decrease the quarterly sampling requirement specified in subsection (C)(1) (a) of this section provided it has determined that the system is reliably and consistently below the MCL. In no case shall the Director make this determination unless a:

i. groundwater system takes a minimum of two quarterly samples; or

ii. surface water system takes a minimum of four quarterly samples.

c. After the Director determines the public water system is reliably and consistently below the MCL, the Director may allow the system to sample annually. Public water systems which sample annually must sample during the quarter that previously yielded the highest analytical result.

d. Public water systems which have 3 consecutive annual samples with no detection of a contaminant may apply to the Director for a waiver as specified in subsection (F)(2) of this section.

2. Detection, as used in this subsection, shall be defined as greater than or equal to the following concentrations for each contaminant.

TABLE 400.2 DETECTION LIMIT

CONTAMINANT	LIMIT (mg/l)
Alachlor	0.0002
Aldicarb	0.0005
Aldicarb sulfoxide	0.0005
Aldicarb sulfone	0.0008
Atrazine	0.0001
Benzo(a)pyrene	0.00002
Carbofuran	0.0009

Chlordane	0.0002
Dalapon	0.001
1,2-Dibromo-3-chloropropane (DBCP)	0.00002
Di(2-ethylhexyl) adipate	0.0006
Di(2-ethylhexyl) phthalate	0.0006
Dinoseb	0.0002
Diquat	0.0004
2,4-D	0.0001
Endothall	0.009
Endrin	0.00001
Ethylene dibromide (EDB)	0.00001
Glyphosate	0.006
Heptachlor	0.00004
Heptachlor epoxide	0.00002
Hexachlorobenzene	0.0001
Hexachlorocyclopentadiene	0.0001
Lindane	0.00002
Methoxychlor	0.0001
Oxamyl	0.002
Picloram	0.0001
Polychlorinated biphenyls (PCBs) (as decachlorobiphenyl)	0.0001
Pentachlorophenol	0.00004
Simazine	0.00007
Toxaphene	0.001
2,3,7,8-TCDD (Dioxin)	0.000000005
2,4,5-TP (Silvex)	0.0002

3. If PCBs (as one of seven Arochlors) are detected (as designated in this subsection) in any sample analyzed using Methods 505 or 508, the public water system shall re-analyze the sample using Method 508A to quantitate PCBs (as decachlorobiphenyl).

TABLE 400.3 DETECTION LIMIT OF PCB

AROCHLOR	DETECTION LIMIT (mg/l)
1016	0.00008
1221	0.02
1232	0.0005

1242	0.0003
1248	0.0001
1254	0.0001
1260	0.0002

a. Compliance with the PCB MCL shall be determined based upon the quantitative results of analyses using Method 508A.

D. Compliance with the MCL for Synthetic Organic Chemicals

1. Compliance with § 204 (A)(2) shall be determined based on the analytical results obtained at each sampling point. If one sampling point is in violation of an MCL, the system is in violation of the MCL.

a. For public water systems which are conducting sampling at a frequency greater than annual, compliance with the MCL is determined by a running annual average at each sampling point.

i. Public water systems monitoring annually or less frequently whose sample result exceeds the regulatory detection level as defined by subsection (C)(2) of this section must begin quarterly sampling. The system will not be considered in violation of the MCL until it has completed one year of quarterly sampling.

ii. If any sample result will cause the running annual average to exceed the MCL at any sampling point, the public water system is out of compliance with the MCL immediately.

iii. If a public water system fails to collect the required number of samples, compliance will be based on the total number of samples collected.

iv. If a sample result is less than the detection limit, zero will be used to calculate the annual average.

2. All new public water systems or systems that use a new source of water that begin operation after January 22, 2004 must demonstrate compliance with the MCL within a period of time specified by the Director. The system must also comply with the initial sampling frequencies specified by the Director to ensure a system can demonstrate compliance with the MCL. Routine and increased monitoring frequencies shall be conducted in accordance with the requirements in this section.

E. Response to Violations of the MCL for Synthetic Organic Chemicals

1. Public water systems which violate the requirements of § 204 (A)(2) as determined by subsection (D)(1) of this section must sample quarterly. After a minimum of four quarterly samples show the system is in compliance and the Director determines the public water system is reliably and consistently below the MCL, as specified in subsection (D)(1) of this section, the public water system shall sample at the frequency specified in subsection (C)(1)(c) of this section.

2. The Director has the authority to determine compliance or initiate enforcement action based upon analytical results and other information compiled by his/her authorized representative(s).

F. Waivers

1. Each CWS and NTNCWS may apply to the Director for a waiver from the requirement of subsection (A)(4) of this section. A public water system must reapply for a waiver for each three-year compliance period.

2. A Director may grant a waiver after evaluating the following factor(s):

a. Knowledge of previous use (including transport, storage, or disposal) of the contaminant within the watershed or zone of influence of the public water system.

If a determination by the Director reveals no previous use of the contaminant within the watershed or zone of influence, a waiver may be granted.

b. If previous use of the contaminant is unknown or it has been used previously, then the following factors shall be used to determine whether a waiver is granted.

i. Previous analytical results.

ii. The proximity of the public water system to a potential point or non-point source of contamination. Point sources include spills and leaks of chemicals at or near a water treatment facility or at manufacturing, distribution, or storage facilities, or from hazardous and municipal waste landfills and other waste handling or treatment facilities. Non-point sources include the use of pesticides to control insect and weed pests on agricultural areas, forest lands, home and gardens, and other land application uses.

iii. The environmental persistence and transport of the pesticide or PCBs.

iv. How well the water source is protected against contamination due to such factors as depth of the well and the type of soil and the integrity of the well casing.

v. Elevated nitrate levels at the water supply source.

vi. Use of PCBs in equipment used in the production, storage, or distribution of water (i.e., PCBs used in pumps, transformers, etc.).

§ 411 SAMPLING FREQUENCY AND COMPLIANCE REQUIREMENTS FOR RADIONUCLIDES IN COMMUNITY WATER SYSTEMS

A. Sampling, analysis, and compliance requirements for radionuclides.

Sampling and analyses for the following contaminants shall be conducted to determine compliance with § 209 (radioactivity) in accordance with the methods found in Appendix A. With the written permission of the Director, concurred in by the Administrator of the EPA, or their equivalent determined by EPA an alternate analytical technique may be employed in accordance with Appendix A § 401-A.

1. Community water systems (CWSs) must conduct initial monitoring to determine compliance with § 209(A) by December 31, 2007. For the purposes of monitoring for gross alpha particle activity, radium-226, radium-228, uranium, and beta particle and photon radioactivity in drinking water, "detection limit" is defined as in Appendix A § 405-A (C).

a. Applicability and sampling location for existing CWSs or sources. All existing CWSs using ground water, surface water or systems using both ground and surface water must sample at every entry point to the distribution system that is representative of all sources being used under normal operating conditions. The public water system must take each sample at the same sampling point unless conditions make another sampling point more representative of each source or the Director has designated a distribution system location, in accordance with subsection (A)(2)(b)(iii) of this section.

b. Applicability and sampling location for new CWSs or sources.

i. All new CWSs or CWSs that use a new source of water must begin to conduct initial monitoring for the new source within the first quarter after initiating use of the source.

ii. CWSs must conduct more frequent monitoring when ordered by the Director in the event of possible contamination or when changes in the distribution system or treatment processes occur which may increase the concentration of radioactivity in finished water.

2. Initial monitoring: Public water systems must conduct initial monitoring for gross alpha particle activity, radium-226, radium-228, and uranium as follows:

a. Public water systems without acceptable historical data, as defined below, must collect four consecutive quarterly samples at all sampling points before December 31, 2007.

b. Grandfathering of data: The Director may allow historical monitoring data collected at a sampling point to satisfy the initial monitoring requirements for that sampling point, for the following situations.

i. To satisfy initial monitoring requirements, a CWS having only one entry point to the distribution system may use the monitoring data from the last compliance monitoring period that began between June 2000 and December 8, 2003.

ii. To satisfy initial monitoring requirements, a CWS with multiple entry points and having appropriate historical monitoring data for each entry point to the distribution system may use the monitoring data from the last compliance monitoring period that began between June 2000 and December 8, 2003.

iii. To satisfy initial monitoring requirements, a CWS with appropriate historical data for a representative point in the distribution system may use the monitoring data from the last compliance monitoring period that began between June 2000 and December 8, 2003, provided that the Director finds that the historical data satisfactorily demonstrate that each entry point to the distribution system is expected to be in compliance based upon the historical data and reasonable assumptions about the variability of contaminant levels between entry points. The Director must make a written finding indicating how the data conforms to these requirements.

c. For gross alpha particle activity, uranium, radium-226, and radium-228 monitoring, the Director may waive the final two quarters of initial monitoring for a sampling point if the results of the samples from the previous two quarters are below the detection limit.

d. If the average of the initial monitoring results for a sampling point is above the MCL, the public water system must collect and analyze quarterly samples at that sampling point until the system has results from four consecutive quarters that are at or below the MCL, unless the public water system enters into another schedule as part of a formal compliance agreement with the Director.

3. Compositing: To fulfill quarterly monitoring requirements for gross alpha particle activity, radium-226, radium-228, or uranium, a public water system may composite up to four consecutive quarterly samples from a single entry point if analysis is done within a year of the first sample. The Director will treat analytical results from the composited as the average analytical result to determine compliance with the MCLs and the future monitoring frequency. If the analytical result from the composited sample is greater than ½ MCL, the Director may direct the system to take additional quarterly samples before allowing the system to sample under a reduced monitoring schedule.

4. A gross alpha particle activity measurement may be substituted for the required radium-226 measurement provided that the measured gross alpha particle activity does not exceed 5 pCi/l. A gross alpha particle activity measurement may be substituted for the required uranium measurement provided that the measured gross alpha particle activity does not exceed 15 pCi/l. The gross alpha measurement shall have a confidence interval of 95% (1.65σ, where σ is the standard deviation of the net counting rate of the sample) for radium-226 and uranium. When a public water system uses a gross alpha particle activity measurement in lieu of a radium-226 and/or uranium measurement, the gross alpha particle activity analytical result will be used to determine the future monitoring frequency for radium-226 and/or uranium. If the gross alpha particle activity result is less than detection, ½ the detection limit will be used to determine compliance and the future monitoring frequency.

B. Detection Limits for Radionuclides

For the purpose of sampling radioactivity concentrations in drinking water, the required sensitivity of the radioanalysis is defined in terms of a detection limit. The detection limit shall be that concentration which can be counted with a precision of ± 100% at the 95% confidence level (1.96 sigma, where sigma is the standard deviation of the net counting rate of the sample).

1. To determine compliance with Table 200.10, (#'s 1, 2 and 4) the detection limit shall not exceed the concentrations in Table 400.4.

Table 400.4 Detection Limits For Gross Alpha Particle Activity, Radium 226, Radium 228 and Uranium

Contaminant	Detection Limit
Gross alpha particle activity	3 pCi/L
Radium 226	1 pCi/L
Radium 228	1 pCi/L
Uranium	1μg/L

2. To determine compliance with § 209 (A)(1) (#3 - Beta particle and photon radioactivity), the detection limits shall not exceed the concentrations listed in Table 400.5.

TABLE 400.5 DETECTION LIMITS FOR MAN-MADE BETA PARTICLE AND PHOTON EMITTERS

RADIONUCLIDE	DETECTION LIMIT
Tritium	1,000 pCi/l
Strontium-89	10 pCi/l
Strontium-90	2 pCi/l
Iodine-131	1 pCi/l
Cesium-134	10 pCi/l
Gross Beta	4 pCi/l
Other Radionuclides	1/10 of the applicable limit

C. Compliance with the MCL for Radionuclides

1. The Director may require more frequent monitoring than specified in subsection (A) of this section, or may require confirmation samples at the Director's discretion. The results of the initial and confirmation samples will be averaged for use in compliance determinations.

2. Each public water system shall monitor at the time designated by the Director during each compliance period.

3. Compliance with § 209 (A) will be determined based on the analytical result(s) obtained at each sampling point. If one sampling point is in violation of an MCL, the system is in violation of the MCL.

   a. For public water systems sampling more than once per year, compliance with the MCL is determined by a running annual average at each sampling point. If the average of any sampling point is greater than the MCL, then the system is out of compliance with the MCL.

   b. For public water systems sampling more than once per year, if any sample result will cause the running average to exceed the MCL at any sample point, the system is out of compliance with the MCL immediately.

   c. Public water systems must include all samples taken and analyzed under the provisions of this section in determining compliance, even if that number is greater than the minimum required.

   d. If a public water system does not collect all required samples when compliance is based on a running annual average of quarterly samples, compliance will be based on the running average of the samples collected.

   e. If a sample result is less than the detection limit, zero will be used to calculate the annual average, unless a gross alpha particle activity is being used in lieu of radium-226 and/or uranium. If the gross alpha particle activity result is less

than detection, ½ the detection limit will be used to calculate the annual average.

4. The Director shall have the discretion to delete results of obvious sampling or analytic errors.

5. If the MCL for radioactivity set forth in § 209 (A) is exceeded, the operator of a CWS must give notice to the Director pursuant to § 502 and to the public as required by § 603.

D. Response to Violations of the MCL for Radionuclides

1. The Director has the authority to determine compliance or initiate enforcement action based upon analytical results or other information compiled by an authorized representative.

2. To judge compliance with the MCLs listed in § 209, averages of data shall be used and shall be rounded to the same number of significant figures as the MCL for the substance in question.

E. Reduced Monitoring

1. The Director may allow CWSs to reduce the future frequency of monitoring from once every three years to once every six or nine years at each sampling point, based on the following criteria.

a. If the average of the initial monitoring results for each contaminant (i.e., gross alpha particle activity, uranium, radium-226, or radium-228) is below the detection limit specified in Table 400.4, in § 411 (B)(1), the system must collect and analyze for that contaminant using at least one sample at that sampling point every nine years.

b. For gross alpha particle activity and uranium, if the average of the initial monitoring results for each contaminant is at or above the detection limit but at or below ½ the MCL, the system must collect and analyze for that contaminant using at least one sample at that sampling point every six years.

c. For combined radium-226 and radium-228, the analytical results must be combined.

i. If the average of the combined initial monitoring results for radium-226 and radium-228 is at or above the detection limit but at or below ½ the MCL, the CWS must collect and analyze for that contaminant using at least one sample at that sampling point every six years.

d. For gross alpha particle activity and uranium, if the average of the initial monitoring results for each contaminant is above ½ the MCL but at or below the MCL, the public water system must collect and analyze at least one sample at that sampling point every three years.

e. For combined radium-226 and radium-228, the analytical results must be combined.

i. If the average of the combined initial monitoring results for radium-226 and radium-228 is above ½ the MCL but at or below the MCL, the public water system must collect and analyze at least one sample at that sampling point every three years.

f. Public water systems must use the samples collected during the reduced monitoring period to determine the monitoring frequency for subsequent monitoring periods (e.g., if a system's sampling point is on a nine year monitoring period, and the sample result is above ½ MCL, then the next monitoring period for that sampling point is three years).

g. If a public water system has a monitoring result that exceeds the MCL while on reduced monitoring, the system must collect and analyze quarterly samples at that sampling point until the system has results from four consecutive quarters that are below the MCL, unless the system enters into another schedule as part of a formal compliance agreement with the Director.

§ 412 MONITORING AND COMPLIANCE REQUIREMENTS FOR BETA PARTICLE AND PHOTON RADIOACTIVITY

A. To determine compliance with the maximum contaminant levels in § 209 for beta particle and photon radioactivity, a public water system must monitor at a frequency as follows:

1. CWSs (both surface and ground water) designated by the Director as vulnerable must sample for beta particle and photon radioactivity. Public water systems must collect quarterly samples for beta emitters and annual samples for tritium and strontium-90 at each entry point to the distribution system, beginning within one quarter after being notified by the Director. Public water systems already designated by the Director must continue to sample until the Director reviews and either reaffirms or removes the designation.

   a. If the gross beta particle activity minus the naturally occurring potassium-40 beta particle activity at a sampling point has a running annual average (computed quarterly) less than or equal to 50 pCi/L (screening level), the Director may reduce the frequency of monitoring at that sampling point to once every 3 years. Public water systems must collect all samples required in (A)(1) of this section during the reduced monitoring period.

   b. For systems in the vicinity of a nuclear facility, the Director may allow the CWS to utilize environmental surveillance data collected by the nuclear facility in lieu of monitoring at the system's entry point(s), where the Director determines if such data is applicable to a particular public water system. In the event that there is a release from a nuclear facility, systems which are using surveillance data must begin monitoring at the CWS's entry point(s) in accordance with (A)(1) of this section.

2. CWSs (both surface and ground water) designated by the Director as utilizing waters contaminated by effluents from nuclear facilities must sample for beta particle and photon radioactivity. Public water systems must collect quarterly samples for beta emitters and iodine-131 and annual samples for tritium and strontium-90 at each entry point to the distribution system, beginning within one quarter after being notified by the Director. Systems already designated by the Director as systems using waters contaminated by effluents from nuclear facilities must continue to sample until the Director reviews and either reaffirms or removes the designation.

   a. Quarterly monitoring for gross beta particle activity shall be based on the analysis of monthly samples or the analysis of a composite of three monthly samples. The former is recommended.

   b. For iodine-131, a composite of five consecutive daily samples shall be analyzed once each quarter. As ordered by the Director, more frequent monitoring shall be conducted when iodine-131 is identified in the finished water.

   c. Annual monitoring for strontium-90 and tritium shall be conducted by means of the analysis of a composite of four consecutive quarterly samples or analysis of four quarterly samples. The latter procedure is recommended.

   d. If the gross beta particle activity beta minus the naturally occurring potassium-40 beta particle activity at a sampling point has a running annual average (computed quarterly) less than or equal to 15 pCi/L, the Director may reduce the frequency of monitoring at that sampling point to every 3 years. Public water systems must collect all samples required in (A)(2) of this section during the reduced monitoring period.

   e. For systems in the vicinity of a nuclear facility, the Director may allow the CWS to utilize environmental surveillance data collected by the nuclear facility in lieu of monitoring at the system's entry point(s), where the Director determines if such data is applicable to a particular public water system. In the event that there is a release from a nuclear facility, systems which are using surveillance data must begin monitoring at the CWS's entry point(s) in accordance with (A)(2) of this section.

3. CWSs designated by the Director to monitor for beta particle and photon radioactivity can not apply to the Director for a waiver from the monitoring frequencies specified in (A)(1) or (A)(2) of this section.

4. CWSs may analyze for naturally occurring potassium-40 beta particle activity from the same or equivalent sample used for the gross beta particle activity analysis. Systems are allowed to subtract the potassium-40 beta particle activity value from the total gross beta particle activity value to determine if the screening level is exceeded. The potassium-40 beta particle activity must be calculated by multiplying elemental potassium concentrations (in

mg/L) by a factor of 0.82.

5. If the gross beta particle activity minus the naturally occurring potassium-40 beta particle activity exceeds the screening level, an analysis of the sample must be performed to identify the major radioactive constituents present in the sample and the appropriate doses must be calculated and summed to determine compliance with § 209 (A)(1)(#3,Note 2), using the formula in § 209 (A)(1)(#3, Note 3). Doses must also be calculated and combined for measured levels of tritium and strontium to determine compliance.
6. Public water systems must monitor monthly at the sampling point(s) which exceed the maximum contaminant level in § 209 (A)(1) beginning the month after the exceedance occurs. Public water systems must continue monthly monitoring until the system has established, by a rolling average of 3 monthly samples, that the MCL is being met. Public water systems who establish that the MCL is being met must return to quarterly monitoring until the systems meet the requirements set forth in (A)(1)(b) or (A)(2)(a) of this section.

§ 413 TURBIDITY SAMPLING AND ANALYTICAL REQUIREMENTS

The requirements in this section apply to unfiltered systems that the Director has determined, in writing pursuant to § 2535 of the NNSDWA, must install filtration, until June 29, 1993, or until filtration is installed, whichever is later.

A. Samples shall be taken by public water system owners or operators for both community and non-CWSs at a representative entry point(s) to the water distribution system at least once per day, for the purpose of making turbidity measurements to determine compliance with § 206. If the Director determines that a reduced sampling frequency in a non-CWS will not pose a risk to public health, the Director can reduce the required sampling frequency. The option of reducing the turbidity frequency shall be permitted only in those public water systems that practice disinfection and which maintain an active residual disinfectant in the distribution system, and in cases where the Director has indicated in writing that no unreasonable risk to health existed under the circumstances of this option. Turbidity measurements shall be made as directed in Appendix D § 801-D (B).

B. If the result of a turbidity analysis indicates that the maximum allowable limit has been exceeded, the sampling and measurement shall be confirmed by resampling as soon as practical and preferably within one hour. If the repeat sample confirms that the maximum allowable limit has been exceeded, the public water system owner or operator shall report to the Director within forty-eight hours. The repeat sample shall be the sample used for the purpose of calculating the monthly average. If the monthly average of the daily samples exceeds the maximum allowable limit, or if the average of two samples taken on consecutive days exceeds 5 NTU, the public water system owner or operator shall report to the Director and notify the public as required by §§ 502 and 603.

C. Sampling for non-CWSs shall begin within two years after the effective date of this part.

D. The requirements of this section shall apply only to public water systems which use water obtained in whole or in part from surface sources.

E. The Director has the authority to determine compliance or initiate enforcement action based upon analytical results or other information compiled by his/her authorized representative(s).

§ 414 ALTERNATE ANALYTICAL TECHNIQUES

With the written permission of the Director, concurred in by the Administrator of the U.S. EPA, an alternate analytical technique may be employed. An alternate technique shall be accepted only if it is substantially equivalent to the prescribed test in both precision and accuracy as it relates to the determination of compliance with an MCL. The use of the alternate analytical technique shall not decrease the frequency of monitoring required by this part.

PART V
REPORTING AND RECORDKEEPING

§ 501 PURPOSE

The purpose of this part is to define the reporting and recordkeeping requirements for all public water system owners/operators.

§ 502 REPORTING REQUIREMENTS

A. Except where a shorter period is specified in this part, the public water system owner or operator shall report to the Director the results of any test measurement or analysis required by these regulations within:

1. The first ten days following the month in which the result is received, or

2. The first ten days following the end of the required sampling period as stipulated by the Director, whichever of these is shorter.

B. Except where a different reporting period is specified in this part, the public water system owner or operator must report to the Director within 48 hours the failure to comply with NNPDWR (including failure to comply with sampling requirements) set forth in these regulations;

C. The public water system owner or operator is not required to report analytical results to the Director in cases where an approved EPA laboratory reports the results directly to the Director.

D. The public water system, within 10 days of completing the public notification requirements under Part VI(Public Notification) of these regulations for the initial public notice and any repeat notices, must submit to the PWSSP a certification that it has fully complied with the public notification regulations. The water system must include with this certification a representative copy of each type of notice distributed, published, posted, or made available to the persons served by the system and to the media.

E. The public water system owner or operator shall submit to the Director within the time stated in the request copies of any records required to be maintained under § 503 or copies of any documents which the Director is entitled to inspect pursuant to the authority of §§ 2541 and 2542 of the NNSDWA.

§ 503 RECORD MAINTENANCE

Any public water system owner or operator subject to these regulations shall retain on its premises or at a convenient location near its premises the following records for the following periods:

A. Records of microbiological analyses and turbidity analyses made pursuant to this part shall be kept for not less than 5 years. Records of chemical analyses made pursuant to these regulations shall be kept for not less than 10 years. Actual laboratory reports may be kept, or data may be transferred to tabular summaries, provided that the following information is included:

1. The date, place, Navajo Nation well identification number, and time of sampling, and the name of the person who collected the sample;

2. Identification of the sample as to whether it was a routine distribution system sample, check sample, raw or processed water sample or other special purpose sample;

3. Date of analysis;

4. Laboratory and person responsible for performing analysis;

5. The analytical technique/method used; and

6. The results of the analysis.

B. Records of action taken by the system to correct violations of these regulations shall be kept for a period not less than 3 years after the last action taken with respect to the particular violation involved.

C. Copies of any written reports, summaries or communications relating to sanitary surveys of the

system conducted by the system itself, by a private consultant, or by any Tribal, state or federal agency, shall be kept for a period not less than 10 years after completion of the sanitary survey involved.

D. Records concerning a variance or exemption granted to the system shall be kept for a period ending not less than 5 years following the expiration of such variance or exemption.

E. Copies of public notices issued pursuant to Part VI and certifications made to the NNEPA-PWSSP pursuant to § 502 must be kept for three years after issuance.

F. Copies of the consumer confidence reports submitted by water systems must be kept at the PWSSP office for a period of one year.

1. Copies of the certifications that consumer confidence reports were submitted to the consumers must be retained at the PWSSP office for a period of five years.

G. Copies of monitoring plans developed pursuant to these regulations shall be kept for the same period of time as the records of analyses taken under the plan are required to be kept under subsection (A) of this section, except as specified elsewhere in these regulations.

Part VI
PUBLIC NOTIFICATION OF DRINKING WATER VIOLATIONS

§ 601 PURPOSE

The purpose of this part is to define the requirements for publicly notifying persons served by a public water system of any noncompliance with the NNSDWA.

§ 602 GENERAL PUBLIC NOTIFICATION REQUIREMENTS

Public water systems must comply with the requirements in this section upon promulgation of these regulations.

A. Each owner or operator of a public water system (CWS, NTNCWS, TNCWS) must give notice for all violations of the NNPDWR and for other situations, as listed in Table 600.1. The term "NNPDWR violations" is used in this section to include violations of the maximum contaminant level (MCL), maximum residual disinfection level (MRDL), treatment technique (TT), monitoring requirements, and testing procedures in these regulations. Appendix B to these regulations identifies the tier assignment for each specific violation or situation requiring a public notice.

Table 600.1 Violation Categories and Other Situations Requiring a Public Notice

1. NNPDWR violations: a. Failure to comply with an applicable MCL or MRDL. b. Failure to comply with a prescribed treatment technique (TT). c. Failure to perform water quality monitoring, as required by the drinking water regulations. d. Failure to comply with testing procedures as prescribed by a drinking water regulation.
2. Variance and exemptions under §§ 2561, 2562, and 2563 of NNSDWA: a. Operation under a variance or an exemption. b. Failure to comply with the requirements of any schedule that has been set under a variance or exemption.
3. Special public notices: a. Occurrence of a waterborne disease outbreak or other waterborne emergency. b. Exceedance of the nitrate MCL by non-community water systems, where granted permission by the Director under § 202(C) of these regulations. c. Exceedance of the secondary maximum contaminant level (SMCL) for fluoride. d. Other violations and situations determined by the Director to require a public notice under this section, not already listed in Appendix B.

B. Types of public notice required for each violation or situation.

a. Public notice requirements are divided into three tiers (Table 600.2) to take into account the seriousness of the violation or situation and of any potential adverse health effects that may be involved.

1. The public notice requirements for each violation or situation listed in Table 600.1 of this section are determined by the tier to which it is assigned.

2. Table 600.2 of this section provides the definition of each tier. Appendix B of this part identifies the tier assignment for each specific violation or situation.

Table 600.2 Definition of Public Notice Tiers

1. Tier 1 Public Notice: Required for NNPDWR violations and situations with significant potential to have serious adverse effects on human health as a result of short-term exposure.

2. Tier 2 Public Notice: Required for all other NNPDWR violations and situations with potential to have serious adverse effects on human health.
3. Tier 3 Public Notice: Required for all other NNPDWR violations and situations not included in Tier 1 and Tier 2.

C. Notification

1. Each public water system must provide public notice to persons served by the water system, in accordance with this section. Public water systems that sell or otherwise provide drinking water to other water systems (i.e., to consecutive systems) are required to give public notice to the owner or operator of the consecutive system; the consecutive system is responsible for providing public notice to the persons it serves.

b. If a public water system has a violation in a portion of the distribution system that is physically or hydraulically isolated from other parts of the distribution system, the Director may allow the system to limit distribution of the public notice to only persons served by that portion of the system which is out of compliance. Permission by the Director for limiting distribution of the notice must be granted in writing.

c. A copy of the notice must also be sent to the Director, in accordance with the requirements under § 502(D).

§ 603 TIER 1 PUBLIC NOTICE: FORM, MANNER, AND FREQUENCY OF NOTICE

A. Violations or situations requiring a Tier 1 Public Notice.

1. Table 600.3 of this section lists the violation categories and other situations requiring a Tier 1 Public Notice.

2. Appendix B to these regulations identifies the tier assignment for each specific violation or situation.

Table 600.3 Violation Categories and Other Situations Requiring a Tier 1 Public Notice

1. Violation of the MCL for total coliforms when fecal coliform or E. coli are present in the water distribution system (as specified in §205(C)(3)), or when the public water system fails to test for fecal coliforms or E. coli when any repeat sample tests positive for coliform (as specified in §404(E));
2. Violation of the MCL for nitrate, nitrite, or total nitrate and nitrite, as defined in §203, or when the public water system fails to take a confirmation sample within 24 hours of the system's receipt of the first sample showing an exceedance of the nitrate or nitrite MCL, as specified in §407(B) and 408(B);
3. Exceedance of the nitrate MCL by NTNCWS and TNCWS, where permitted to exceed the MCL by the Director under §202(C), as required under §610;
4. Violation of the MRDL for chlorine dioxide, as defined in §208(A)(1), when one or more samples taken in the distribution system the day following an exceedance of the MRDL at the entrance of the distribution system exceeds the MRDL, or when the public water system does not take the required samples in the distribution system, as specified in §1104(C)(2)(a);
5. Violation of the turbidity MCL under §206(B), where the Director determines after consultation that a Tier 1 notice is required or where consultation does not take place within 24 hours after the system learns of the violation;

6.	Violation of the Part VIII - General Requirements For Surface Water Treatment or Part XIII - Enhanced Surface Water Treatment technique, Part XXI-Long Term 1 Enhanced Surface Water Treatment (LT1ESWTR) requirement resulting from a single exceedance of the maximum allowable turbidity limit (as identified in Appendix B), where the Director determines after consultation that a Tier 1 notice is required or where consultation does not take place within 24 hours after the system learns of the violation;
7.	Occurrence of a waterborne disease outbreak, as defined in §104, or other waterborne emergency (such as a failure or significant interruption in key water treatment processes, a natural disaster that disrupts the water supply or distribution system, or a chemical spill or unexpected loading of possible pathogens into the source water that significantly increases the potential for drinking water contamination);
8.	Detection of E.coli, enterococci, or coliphage in source water samples as specified in §2503(a) and §2503(b).
9.	Other violations or situations with significant potential to have serious adverse effects on human health as a result of short-term exposure, as determined by the Director either in its regulations or on a case-by-case basis.

B. Additional Required Steps for Tier 1 Public Notice.

Public water systems must:

1. Provide a public notice as soon as practical but no later than 24 hours after the system learns of the violation;

2. Initiate consultation with the Director as soon as practical, but no later than 24 hours after the public water system learns of the violation or situation, to determine additional public notice requirements; and

3. Comply with any additional public notification requirements (including any repeat notices or direction on the duration of the posted notices) that are established as a result of the consultation with the Director. Such requirements may include the timing, form, manner, frequency, and content of repeat notices (if any) and other actions designed to reach all persons served.

C. Form and manner of the public notice.

Public water systems must provide the notice within 24 hours in a form and manner appropriate to reach all persons served, in English or Navajo. The form and manner used by the public water system are to fit the specific situation, but must be designed to reach residential, transient, and non-transient users of the water system. In order to reach all persons served, public water systems are to use, at a minimum, one or more of the following forms of delivery:

1. Appropriate broadcast media (such as radio and television);

2. Posting of the notice in conspicuous locations throughout the area served by the public water system;

3. Hand delivery of the notice to persons served by the public water system; or

4. Another delivery method approved in writing by the Director.

§ 604 TIER 2 PUBLIC NOTICE-FORM, MANNER, AND FREQUENCY OF NOTICE

A. Violations or situations requiring a Tier 2 Public Notice. Table 600.4 of this section lists the violation categories and other situations requiring a Tier 2 Public Notice. Appendix B to this subpart identifies the tier assignment for each specific violation or situation.

Table 600.4 Violation Categories and Other Situations Requiring a Tier 2 Public Notice

1.	All violations of the MCL, MRDL, and treatment technique requirements, except where a Tier 1 Public Notice is required under § 604(A) or where the Director determines that a Tier 1 Public Notice is required;
2.	Violations of the monitoring and testing procedure requirements, where the Director determines that a Tier 2 Public Notice rather than a Tier 3 Public Notice is required, taking into account potential health impacts and persistence of the violation; and
3.	Failure to comply with the terms and conditions of any variance or exemption in place.
4.	Failure to take corrective action or failure to maintain at least 4-log treatment of viruses (using inactivation, removal, or a Director-approved combination of 4-log virus inactivation and removal) before or at the first customer under §2504(a).

B. Tier 2 Public Notification.

1. Public water systems must provide the public notice as soon as practical, but no later than 30 days after the system learns of the violation.

   a. If the public notice is posted, the notice must remain in place for as long as the violation or situation persists, but in no case for less than seven days, even if the violation or situation is resolved.

   b. The Director, in appropriate circumstances, may allow additional time for the initial notice of up to three months from the date the system learns of the violation.

   c. It is not appropriate for the Director to grant an extension to the 30-day deadline for any unresolved violation or to allow across-the-board extensions by rule or policy for other violations or situations requiring a Tier 2 public notice.

   d. Extensions granted by the Director must be in writing.

2. The public water system must repeat the notice every three months as long as the violation or situation persists, unless the Director determines that appropriate circumstances warrant a different repeat notice frequency.

   a. In no circumstance may the repeat notice be given less frequently than once per year.

   b. It is not appropriate for the Director to allow less frequent repeat notice for an MCL violation under the Total Coliform Regulations or a treatment technique violation under Part VIII - General Requirements for Surface Water Treatment or Part XIII - Enhanced Surface Water Treatment.

   c. It is also not appropriate for the Director to allow through its rules or policies across-the-board reductions in the repeat notice frequency for other ongoing violations requiring a Tier 2 repeat notice.

   d. Director-determinations allowing repeat notices to be given less frequently than once every three months must be in writing.

3. For the turbidity violations specified in this paragraph, public water systems must consult with the Director as soon as practical but no later than 24 hours after the public water system learns of the violation, to determine whether a Tier 1 Public Notice under § 604(A) is required to protect public health. When consultation does not take place within the 24-hour period, the public water system must distribute a Tier 1 notice of the violation within the next 24 hours (i.e., no later than 48 hours after the system learns of the violation), following the requirements under §604(B) and (C). Consultation with the Director is required for:

   a. Violation of the turbidity MCL under §206(B); or

   b. Violation of the SWTR, ESWTR or LT1ESWTR treatment technique requirement resulting from a single exceedance of the maximum allowable turbidity limit.

C. Form and manner of the Tier 2 Public Notice.

Public water systems must provide the initial public notice and any repeat notices in a form and manner that are appropriate to reach persons served in the required time period. The form and manner of the public notice may vary based on the specific situation and type of water system, but it must at a minimum meet the following requirements:

1. Unless directed otherwise by the Director in writing, CWSs must provide notice by:
   a. Mail or other direct delivery to each customer receiving a bill and to other service connections to which water is delivered by the public water system; and

   b. Any other method appropriate to reach other persons regularly served by the system, if they would not normally be reached by the notice required in subsection (C)(1)(a) of this section.

      i. Such persons may include those who do not pay water bills or do not have service connection addresses (e.g., house renters, apartment dwellers, university students, nursing home patients, prison inmates, etc.).

      ii. Other methods may include: Publication in a local newspaper; delivery of multiple copies for distribution by customers that provide their drinking water to others (e.g., apartment building owners or large private employers); posting in public places served by the system or on the Internet; or delivery to community organizations or chapters.

2. Unless directed otherwise by the Director in writing, NTNCWSs and TNCWSs must provide notice by:

   a. Posting the notice in conspicuous locations throughout the distribution system frequented by persons served by the system, or by mail or direct delivery to each customer and service connection (where known); and

   b. Any other method appropriate to reach other persons served by the system if they would not normally be reached by the notice required in paragraph (C)(2)(a) of this section.

      i. Such persons may include those served who may not see a posted notice because the posted notice is not in a location they routinely pass by.

      ii. Other methods may include: Publication in a local newspaper or newsletter distributed to customers; use of e-mail to notify employees or students; or, delivery of multiple copies in central locations (e.g., community centers, chapters).

§ 605 TIER 3 PUBLIC NOTICE: FORM, MANNER AND FREQUENCY OF NOTICE

A. Violations or situations requiring a Tier 3 Public Notice.

Table 600.5 lists the violation categories and other situations requiring a Tier 3 Public Notice. Appendix B to these regulations identifies the tier assignment for each specific violation or situation.

Table 600.5 Violation Categories and Other Situations Requiring a Tier 3 Public Notice

1.	Monitoring violations under the NNPDWR, except where a Tier 1 Public Notice is required under § 604(A) or where the Director determines that a Tier 2 Public Notice is required;
2.	Failure to comply with a testing procedure established in these regulations, except where a Tier 1 Public Notice is required under § 604(A) or where the Director determines that a Tier 2 Public Notice is required;
3.	Operation under a variance granted under §§ 2561 or 2562 of the NNSDWA or an exemption granted under §§ 2563 of the NNSDWA;
4.	Exceedance of the fluoride secondary maximum contaminant level (SMCL), as required under §609.

B. Tier 3 Public Notification.

1. Public water systems must provide the public notice no later than one year after the public water system learns of the violation or situation or begins operating under a variance or exemption. Following the initial notice, the public water system must repeat the notice annually for as long as the violation, variance, exemption, or other situation persists. If the public notice is posted, the notice must remain in place for as long as the violation, variance, exemption, or other situation persists, but in no case less than seven days (even if the violation or situation is resolved).

2. Instead of individual Tier 3 Public Notices, a public water system may use an annual report detailing all violations and situations that occurred during the previous twelve months, as long as the timing requirements of subsection (B)(1) of this section are met.

C. Form and manner of the Tier 3 Public Notice.

Public water systems must provide the initial notice and any repeat notices in a form and manner that are appropriate to reach persons served in the required time period. The form and manner of the public notice may vary based on the specific situation and type of water system, but it must at a minimum meet the following requirements:

1. Unless directed otherwise by the Director in writing, CWSs must provide notice by:

a. Mail or other direct delivery to each customer receiving a bill and to other service connections to which water is delivered by the public water system; and

b. Any other method appropriate to reach other persons regularly served by the system, if they would not normally be reached by the notice required in subsection (C)(1)(a) of this section.

i. Such persons may include those who do not pay water bills or do not have service connection addresses (e.g., house renters, apartment dwellers, university students, nursing home patients, prison inmates, etc.).

ii. Other methods may include: Publication in a local newspaper; delivery of multiple copies for distribution by customers that provide their drinking water to others (e.g., apartment building owners or large private employers); posting in public places or on the Internet; or delivery to community organizations or chapters.

2. Unless directed otherwise by the Director in writing, NTNCWSs and TNCWSs must provide notice by:

a. Posting the notice in conspicuous locations throughout the distribution system frequented by persons served by the system, or by mail or direct delivery to each customer and service connection (where known); and

b. Any other method appropriate to reach other persons served by the system, if they would not normally be reached by the notice required in subsection (C)(2)(a) of this section.

i. Such persons may include those who may not see a posted notice because the notice is not in a location they routinely pass by.

ii. Other methods may include: Publication in a local newspaper or newsletter distributed to customers; use of e-mail to notify employees or students; or, delivery of multiple copies in central locations (e.g., community centers, chapters).

D. Use of the Consumer Confidence Report to meet the Tier 3 Public Notice Requirements.

For CWSs, the Consumer Confidence Report (CCR) required under § 1200 of these regulations may be used as a vehicle for the initial Tier 3 Public Notice and all required repeat notices, as long as:

1. The CCR is provided to persons served no later than 12 months after the system learns of the violation or situation as required under § 606(B);

2. The Tier 3 Public Notice contained in the CCR follows the content requirements under § 607; and

3. The CCR is distributed following the delivery requirements under § 606(C).

§ 606 CONTENT OF THE PUBLIC NOTICE

A. Elements to be included in the Public Notice for Violations of NNPDWR or Other Situations Requiring a Public Notice.

When a public water system violates a NNPDWR or has a situation requiring public notification, each public notice must include the following elements:

1. A description of the violation or situation, including the contaminant(s) of concern, and (as applicable) the contaminant level(s);

2. When the violation or situation occurred;

3. Any potential adverse health effects from the violation or situation, including the standard language under paragraphs (D)(1) or (D)(2) of this section, whichever is applicable;

4. The population at risk, including sub-populations particularly vulnerable if exposed to the contaminant in their drinking water;

5. Whether alternative water supplies should be used;

6. What actions consumers should take, including when they should seek medical help, if known;

7. What the system is doing to correct the violation or situation;

8. When the public water system expects to return to compliance or resolve the situation;

9. The name, business address, and phone number of the public water system owner, operator, or designee as a source of additional information concerning the notice; and

10. A statement to encourage the notice recipient to distribute the public notice to other persons served, using the standard language under subsection (D)(3) of this section, where applicable.

B. Elements to be included in the public notice for public water systems operating under a variance or exemption.

1. If a public water system has been granted a variance or an exemption, the public notice must contain:

   a. An explanation of the reasons for the variance or exemption;

   b. The date on which the variance or exemption was issued;

   c. A brief status report on the steps the system is taking to install treatment, find alternative sources of water, or otherwise comply with the terms and schedules of the variance or exemption; and

   d. A notice of any opportunity for public input in the review of the variance or exemption.

2. If a public water system violates the conditions of a variance or exemption, the public notice must contain the ten elements listed in subsection (A) of this section.

C. Public Notice Presentation.

1. Each public notice required by this section:

   a. Must be displayed in a conspicuous way when printed or posted;

   b. Must not contain overly technical language or very small print;

   c. Must not be formatted in a way that defeats the purpose of the notice;

d. Must not contain language which nullifies the purpose of the notice.

2. Each public notice required by this section must comply with multilingual requirements, as follows:

a. For public water systems serving a large proportion of non-English speaking consumers, as determined by the Director, the public notice must contain information in Navajo and/or English, or other appropriate languages regarding the importance of the notice or contain a telephone number or address where persons served may contact the public water system to obtain a translated copy of the notice or to request assistance in the appropriate language.

b. In cases where the Director has not determined what constitutes a large proportion of non-English speaking consumers, the public water system must include in the public notice the same information as in subsection (C)(2)(a) of this section, where appropriate to reach a large proportion of non-English speaking persons served by the water system.

D. Public water systems are required to include the following standard language in their public notice:

1. Public water systems must include in each public notice the standard health effects language specified in Appendix B § 602-B for each MCL or MRDL violations, treatment technique violations, and violations of the conditions of a variance or exemption.

2. Public water systems must include the following language in their notice, including the language necessary to fill in the blanks, for all monitoring and testing procedure violations listed in Appendix B:

"We are required to monitor your drinking water for specific contaminants on a regular basis. Results of regular monitoring are an indicator of whether or not your drinking water meets health standards. During [compliance period], we "did not monitor or test" or "did not complete all monitoring or testing" for [contaminant(s)], and therefore cannot be sure of the quality of your drinking water during that time."

3. Standard language to encourage the distribution of the public notice to all persons served must include following language (where applicable):

"Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail."

§ 607 NOTICE TO NEW BILLING UNITS OR NEW CUSTOMERS

A. CWSs must give a copy of the most recent public notice for any continuing violation, the existence of a variance or exemption, or other ongoing situations requiring a public notice to all new billing units or new customers prior to or at the time service begins.

B. NTNCWSs and TNCWSs must continuously post the public notice in conspicuous locations in order to inform new consumers of any continuing violation, variance or exemption, or other situation requiring a public notice for as long as the violation, variance, exemption, or other situation persists.

§ 608 SPECIAL NOTICE FOR EXCEEDANCE OF THE SMCL FOR FLUORIDE

A. Special notice time delivery.

CWSs that exceed the fluoride secondary maximum contaminant level (SMCL) of 2 mg/l as specified in §1800 (determined by the last single sample taken in accordance with §405), but do not exceed the maximum contaminant level (MCL) of 4 mg/l for fluoride (as specified in § 203), must provide the public notice in subsection (C) of this section to persons served.

1. Public notice must be provided as soon as practical but no later than 12 months from the day the water system learns of the exceedance.

2. A copy of the notice must also be sent to all new billing units and new customers at the time service begins and to the PWSSP.

3. The public water system must repeat the notice at least annually for as long as the SMCL

is exceeded. If the public notice is posted, the notice must remain in place for as long as the SMCL is exceeded, but in no case less than seven days (even if the exceedance is eliminated).

4. On a case-by-case basis, the Director may require an initial notice sooner than 12 months and repeat notices more frequently than annually.

B. The form and manner of the public notice (including repeat notices) must follow the requirements for a Tier 3 public notice in § 606(C), (D)(1) and (D)(3).

C. The notice must contain the following mandatory language, including the language necessary to fill in the blanks:

"This is an alert about your drinking water and a cosmetic dental problem that might affect children under nine years of age. At low levels, fluoride can help prevent cavities, but children drinking water containing more than 2 milligrams per liter (mg/L) of fluoride may develop cosmetic discoloration of their permanent teeth (dental fluorosis). The drinking water provided by your community water system [name] has a fluoride concentration of [insert value] mg/L. Dental fluorosis, in its moderate or severe forms, may result in a brown staining and/or pitting of the permanent teeth. This problem occurs only in developing teeth, before they erupt from the gums. Children under nine should be provided with alternative sources of drinking water or water that has been treated to remove the fluoride to avoid the possibility of staining and pitting of their permanent teeth. You may also want to contact your dentist about proper use by young children of fluoride-containing products. Older children and adults may safely drink the water. Drinking water containing more than 4 mg/L of fluoride (the EPA's drinking water standard) can increase your risk of developing bone disease. Your drinking water does not contain more than 4 mg/L of fluoride, but we're required to notify you when we discover that the fluoride levels in your drinking water exceed 2 mg/L because of this cosmetic dental problem. For more information, please call [name of water system contact] of [name of community water system] at [phone number]. Some home water treatment units are also available to remove fluoride from drinking water. To learn more about available home water treatment units, you may call NSF International at 1-877-8-NSF-HELP.''

§ 609 SPECIAL NOTICE FOR NITRATE EXCEEDANCES ABOVE THE MCL BY NTNCWSs and TNCWSs, WHERE GRANTED PERMISSION BY THE DIRECTOR UNDER § 202(C)

A. Special notice time delivery.

NTNCWSs or TNCWSs granted permission by the Director under § 202(C) to exceed the nitrate MCL, must provide notice to persons served according to the requirements for a Tier 1 Public Notice under § 604(A) and (B).

B. NTNCWSs and TNCWSs granted permission by the Director to exceed the nitrate MCL under § 202(C), must provide continuous posting of the fact that nitrate levels exceed 10 mg/L and the potential health effects of exposure, according to the requirements for Tier 1 Public Notice delivery under § 604(C) and the content requirements under § 607.

§ 610 NOTICE BY DIRECTOR ON BEHALF OF THE WATER SYSTEM

A. The Director may give the notice required by this subpart on behalf of the owner and operator of the public water system if the Director complies with the requirements of this subpart.

B. The owner or operator of the public water system remains responsible for ensuring that the requirements of this section are met.

§ 611 SPECIAL NOTICE FOR REPEATED FAILURE TO CONDUCT MONITORING OF THE SOURCE WATER FOR CRYPTOSPORIDIUM AND FOR FAILURE TO DETERMINE BIN CLASSIFICATION OR MEAN CRYPTOSPORIDIUM LEVEL

A. Special notice for failure to monitor.

The owner or operator of a community or non-community water system that is required to monitor source water under §2402(C) must notify persons served by the water system that monitoring has not been completed as specified no later than 30 days after the system has failed to collect any 3 months of monitoring as specified in §2402(C). The notice must be repeated as specified in §605(B).

B. Special notice for failure to determine bin classification or mean Cryptosporidium level.

The owner or operator of a community or non-community water system that is required to determine a bin classification under §2409, or determine mean Cryptosporidium level under §2411, must notify

persons served by the water system that the determination has not been made as required no later than 30 days after the system has failed to report the determination as specified in §2409 (E) or §2411(A), respectively. The notice must be repeated as specified in §605(B). The notice is not required if the system is complying with a Director-approved schedule to address the violation.

C. Form and manner of special notice.

The form and manner of the public notice must follow the requirements for a Tier 2 public notice prescribed in §605(C). The public notice must be presented as required in §605(C).

D. Mandatory language to be contained in special notice.

The notice must contain the following language, including the language necessary to fill in the blanks.

1. The special notice for repeated failure to conduct monitoring must contain the following language:

"We are required to monitor the source of your drinking water for Cryptosporidium. Results of the monitoring are to be used to determine whether water treatment at the (treatment plan name) is sufficient to adequately remove Cryptosporidium from your drinking water. We are required to complete this monitoring and make this determination by (required bin determination date). We "did not monitor or test" or "did not complete all monitoring or testing" on schedule and, therefore, we may not be able to determine by the required date what treatment modifications, if any, must be made to ensure adequate Cryptosporidium removal. Missing this deadline may, in turn, jeopardize our ability to have the required treatment modifications, if any, completed by the deadline required, (date).

For more information, please call (name of water system contact) of (name of water system) at (phone number)."

2. The special notice for failure to determine bin classification or mean Cryptosporidium level must contain the following language:

"We are required to monitor the source of your drinking water for Cryptosporidium in order to determine by (date) whether water treatment at the (treatment plant name) is sufficient to adequately remove Cryptosporidium from your drinking water. We have not made this determination by the required date. Our failure to do this may jeopardize our ability to have the required treatment modifications, if any, completed by the required deadline of (date). For more information, please call (name of water system contact) of (name of water system) at (phone number)."

3. Each special notice must also include a description of what the system is doing to correct the violation and when the system expects to return to compliance or resolve the situation.

PART VII
LEAD AND COPPER

§ 701 PURPOSE

A. These regulations apply to community water systems, non-transient non-community water systems. Effective dates for §§ 704, 707, 708, 712 and 713 became effective on July 7, 1991, and for §§ 701, 705, 706, 709, 710, and 711 became effective on December 7, 1992.

B. These regulations establish a treatment technique that includes requirements for corrosion control treatment, source water treatment, lead service line replacement, and public education. These requirements are triggered, in some cases, by lead and copper action levels measured in samples collected at consumers' taps.

§ 702 PROHIBITION ON USE OF LEAD PIPES, SOLDER, AND FLUX

A. General Requirements

1. Prohibition. Any pipe, solder, or flux, which is used after June 19, 1986, in the installation or repair of:

   a. Any CWS or NTNCWS, or
   b. Any plumbing in a residential or non-residential facility providing water for human consumption which is connected to a CWS or NTNCWS shall be lead free as defined in §104. This subsection shall not apply to leaded joints necessary for the repair of cast iron pipes.

Notice shall be provided notwithstanding the absence of a violation of any NNPDWR, according to § 602.

B. Navajo Nation Enforcement

1. Enforcement of prohibition. The requirements of subsection (A)(1) of this section shall be enforced in the Navajo Nation effective June 19, 1988. The Director shall enforce such requirements through local plumbing codes, or such other means of enforcement as the Director may determine to be appropriate.

C. Penalties: If the Administrator determines that the Director is not enforcing the requirements of subsection (A) of this section, as required pursuant to subsection (B), the Administrator may withhold up to 5% of Federal funds available to the PWSSP for program grants under § 1443 (a) of the Act.

§ 703 COMPLIANCE

A. Lead and copper action levels.

1. The lead action level is exceeded if the concentration of lead in more than 10 % of tap water samples collected during any sampling period conducted in accordance with § 704 is greater than 0.015 mg/L (i.e., if the "90th percentile" lead level is greater than 0.015 mg/L).

2. The copper action level is exceeded if the concentration of copper in more than 10 % of tap water samples collected during any sampling period conducted in accordance with § 704 is greater than 1.3 mg/L (i.e., if the "90th percentile" copper level is greater than 1.3 mg/L).

3. The 90th percentile lead and copper levels shall be computed as follows:

   a. The results of all lead or copper samples taken during a sampling period shall be placed in ascending order from the sample with the lowest concentration to the sample with the highest concentration. Each sampling result shall be assigned a number, ascending by single integers beginning with the number 1 for the sample with the lowest contaminant level. The number assigned to the sample with the highest contaminant level shall be equal to the total number of samples taken.

   b. The number of samples taken during the sampling period shall be multiplied by 0.9.

c. The contaminant concentration in the numbered sample yielded by the calculation in subsection (A)(3)(b) is the 90th percentile contaminant level.

d. For CWSs and NTNCWSs serving fewer than 100 people that collect 5 samples per sampling period, the 90th percentile is computed by taking the average of the highest and second highest concentrations.

B. Corrosion control treatment requirements.

1. All CWSs and NTNCWSs shall install and operate optimal corrosion control treatment.

2. Any CWSs and NTNCWSs that complies with the applicable corrosion control treatment requirements specified by the Director under §§ 705 and 706 shall be deemed in compliance with the treatment requirement contained in subsection (B)(1)of this section.

C. Source water treatment requirements.

1. Any CWS or NTNCWS exceeding the lead or copper action level shall implement all applicable source water treatment requirements specified by the Director under § 709.

D. Lead service line replacement requirements.

1. Any CWS or NTNCWS exceeding the lead action level after implementation of applicable corrosion control and source water treatment requirements shall complete the lead service line replacement requirements contained in § 710.

E. Sampling and analytical requirements.

1. Tap water sampling for lead and copper, sampling for water quality parameters, source water sampling for lead and copper, and analyses of the sampling results under this part shall be completed in compliance with §§ 704, 707 and 708. The sampling methodology can be found in Appendix C-Lead and Copper.

F. Public education requirements.

1. Any CWS or NTNCWS exceeding the lead action level shall implement the public education requirements contained in § 711.

G. Reporting requirements.

1. A CWS or NTNCWS shall report to the Director any information required by the treatment provisions of this part and § 712.

H. Recordkeeping requirements.

1. A CWS or NTNCWS shall maintain records in accordance with § 713.

I. Violation of NNPDWRs.

1. Failure to comply with the applicable requirements of this part shall constitute a violation of the NNPDWR for lead and/or copper.

§ 704 SAMPLING REQUIREMENTS FOR LEAD AND COPPER IN TAP WATER

A. Sample site location.

1. By the applicable date for commencement of sampling under subsection (D)(1) and (D)(2) of this section, each CWS or NTNCWS shall complete a materials evaluation of its distribution system in order to identify a pool of targeted sampling sites that meets the requirements of this section, and which is sufficiently large enough to ensure that the CWS or NTNCWS can collect the number of lead and copper tap samples required in subsection (C) of this section. All sites from which the first draw samples are collected shall be selected from this pool of targeted sampling sites. Sampling sites may not include faucets that have point-of-use or point-of-entry treatment devices designed to remove inorganic contaminants.

2. A CWS or NTNCWS shall use the information on lead, copper, and galvanized steel that it is required to collect under § Appendix C (702-C) of these regulations (special sampling for corrosivity characteristics) when conducting a materials evaluation. When an

evaluation of the information collected pursuant to § Appendix C (702-C) is insufficient to locate the requisite number of lead and copper sampling sites that meet the targeting criteria in subsection (A) of this section, the CWS or NTNCWS shall review the sources of information listed below in order to identify a sufficient number of sampling sites. In addition, the CWS or NTNCWS shall seek to collect such information where possible in the course of its normal operations (e.g., checking service line materials when reading water meters or performing maintenance activities):

a. All plumbing codes, permits, and records in the files of the building department(s) which indicate the plumbing materials that are installed within publicly and privately owned structures connected to the distribution system;

b. All inspections and records of the distribution system that indicate the material composition of the service connections that connect a structure to the distribution system; and

c. All existing water quality information, which includes the results of all prior analyses of the CWS or NTNCWS or individual structures connected to the CWS or NTNCWS, indicating locations that may be particularly susceptible to high lead or copper concentrations.

3. The sampling sites selected for a CWS's sampling pool ("tier 1 sampling sites") shall consist of single family structures that:

a. Contain copper pipes with lead solder installed after 1982 or contain lead pipes; and/or

b. Are served by a lead service line. When multiple-family residences comprise at least 20 % of the structures served by a CWS or NTNCWS, the system may include these types of structures in its sampling pool.

4. Any CWS with insufficient tier 1 sampling sites shall complete its sampling pool with "tier 2 sampling sites" consisting of buildings, including multiple-family residences that:

a. Contain copper pipes with lead solder installed after 1982 or contain lead pipes; and/or

b. Are served by a lead service line.

5. Any CWS with insufficient tier 1 and tier 2 sampling sites shall complete its sampling pool with "tier 3 sampling sites" consisting of single family structures that contain copper pipes with lead solder installed before 1983. A CWS with insufficient tier 1, tier 2, and tier 3 sampling sites shall complete its sampling pool with representative sites throughout the distribution system. For the purpose of this subsection, a representative site is a site in which the plumbing materials used at that site would be commonly found at other sites served by the water system.

6. The sampling sites selected for a NTNCWS ("tier 1 sampling sites") shall consist of buildings that:

a. Contain copper pipes with lead solder installed after 1982 or contain lead pipes; and/or

b. Are served by a lead service line.

7. A NTNCWS with insufficient tier 1 sites that meet the targeting criteria in subsection (A)(6) of this section shall complete its sampling pool with sampling sites that contain copper pipes with lead solder installed before 1983. If additional sites are needed to complete the sampling pool, the NTNCWS shall use representative sites throughout the distribution system. For the purpose of this subsection, a representative site is a site in which the plumbing materials used at that site would be commonly found at other sites served by the water system.

8. Any CWS or NTNCWS whose distribution system contains lead service lines shall draw 50 % of the samples it collects during each sampling period from sites that contain lead pipes, or copper pipes with lead solder, and 50 % of those samples from sites served by a lead service line. A CWS or NTNCWS that cannot identify a sufficient number of sampling sites

served by a lead service line shall collect first draw samples from all of the sites identified as being served by such lines.

B. Sample collection methods.

1. All tap samples for lead and copper collected in accordance with this part, with the exception of lead service line samples collected under § 710 (C), and samples collected under subsection (B)(5) of this section, shall be first draw samples.

2. Each first-draw tap sample for lead and copper shall be one liter in volume and shall have stood motionless in the plumbing system of each sampling site for at least six hours. First-draw samples from residential housing shall be collected from the cold-water kitchen tap or bathroom sink tap. First-draw samples from a non-residential building shall be collected at an interior tap from which water is typically drawn for consumption.

   Non-first-draw samples collected in lieu of first-draw samples pursuant to subsection (B)(5) of this section shall be one liter in volume and shall be collected at an interior tap from which water is typically drawn for consumption. First-draw samples may be collected by the CWS or NTNCWS owner/operator or the owner/operator may allow residents to collect first draw samples after instructing the residents of the sampling procedures specified in this subsection. To avoid problems of residents handling nitric acid, acidification of first draw samples may be done up to 14 days after the sample is collected. After acidification to resolubilize the metals, the sample must stand in the original container for the time specified in the approved EPA method before the sample can be analyzed. If a CWS or NTNCWS owner/operator allows residents to perform sampling, the owner/operator may not challenge, based on alleged errors in sample collection, the accuracy of sampling results.

3. Each service line sample shall be one liter in volume and have stood motionless in the lead service line for at least six hours. Lead service line samples shall be collected in one of the following three ways:

   a. At the tap after flushing the volume of water between the tap and the lead service line. The volume of water shall be calculated based on the interior diameter and length of the pipe between the tap and the lead service line;

   b. Tapping directly into the lead service line; or

   c. If the sampling site is a building constructed as a single-family residence, allowing the water to run until there is a significant change in temperature which would be indicative of water that has been standing in the lead service line.

4. A CWS or NTNCWS owner/operator shall collect each first draw tap sample from the same sampling site from which it collected a previous sample. If, for any reason, the CWS or NTNCWS owner/operator cannot gain entry to a sampling site in order to collect a follow-up tap sample, the CWS or NTNCWS owner/operator may collect the follow-up tap sample from another sampling site in its sampling pool as long as the new site meets the same targeting criteria, and is within reasonable proximity of the original site.

5. A NTNCWS, or a CWS that meets the criteria of § 711 (C)(7)(a) and (b), that does not have enough taps that can supply first-draw samples, as defined in § 104, may apply to the Director in writing to substitute non-first-draw samples. Such water systems must collect as many first-draw samples from appropriate taps as possible and identify sampling times and locations that would likely result in the longest standing time for the remaining sites. The Director has the discretion to waive the requirement for prior Director-approval of non-first-draw sample sites selected by the water system, either through these regulations or written notification to the water system.

C. Number of samples. CWS or NTNCWS owner/operator shall collect at least one sample during each sampling period specified in subsection (D) of this section from the number of sites listed in the first column below ("standard sampling"). A CWS or NTNCWS conducting reduced sampling under subsection (D)(4) of this section shall collect at least one sample from the number of sites specified in the second column ("reduced monitoring") below during each sampling period specified in subsection (D)(4) of this section. Such reduced monitoring sites shall be representative of the sites required for standard monitoring. The Director may specify sampling locations when a water system is conducting reduced monitoring. The table is as follows:

TABLE 700.1 SAMPLING SIZE

System Size (# people served)	# of Sites (Standard Sampling)	# of Sites (Reduced Sampling)
>100,000	100	50
10,001 - 100,000	60	30
3,301 - 10,000	40	20
501 - 3,300	20	10
101 - 500	10	5
≤ 100	5	5

D. SAMPLING REQUIREMENTS

1. All large CWSs or NTNCWSs shall sample during two consecutive six-month periods.

2. All small and medium-size CWSs or NTNCWSs shall sample during each six-month sampling period until:

   a. The CWS or NTNCWS exceeds the lead or copper action level and is therefore required to implement the corrosion control treatment requirements under § 706, in which case the water system shall continue sampling in accordance with subsection (D)(3) of this section, or

   b. The CWS or NTNCWS meets the lead or copper action levels during two consecutive six-month sampling periods, in which case the water system may reduce sampling in accordance with subsection (D)(5) of this section.

3. Sampling after installation of corrosion control and source water treatment.

   a. Any large CWS or NTNCWS which installs optimal corrosion control treatment pursuant to § 706 (D)(4) shall sample during two consecutive six-month sampling periods by the date specified in § 706 (D)(5).

   b. Any small or medium-size CWS or NTNCWS which installs optimal corrosion control treatment pursuant to §706(E)(5) shall sample during two consecutive six-month sampling periods by the date specified in § 706(E)(6).

   c. Any CWS or NTNCWS which installs source water treatment pursuant to § 709 (A)(3) shall sample during two consecutive six-month sampling periods by the date specified in § 709(A)(4).

4. Sampling after the Director specifies water quality parameter values for optimal corrosion control.

   After the Director specifies the value for water quality control parameters under § 705(F), the CWS or NTNCWS shall sample during each subsequent six-month sampling period, with the first sampling period to begin on the date the Director specifies the optimal values under § 705(F).

5. Reduced sampling:

   a. A small or medium-size CWS or NTNCWS that meets the lead and copper action levels during each of two consecutive six-month sampling periods may reduce the number of samples in accordance with subsection (C) of this section, and reduce the frequency of sampling to once per year.

   b. Any CWS or NTNCWS that maintains the range of values for the water quality control parameters reflecting optimal corrosion control treatment specified by the Director under § 705 (F) during each of two consecutive six-month sampling periods may reduce the frequency of monitoring to once per year and reduce the number of lead and copper samples in accordance with subsection (C) of this section if it receives written

approval from the Director. The Director shall review monitoring, treatment and other relevant information submitted by the CWS or NTNCWS in accordance with § 712, and shall notify the water system in writing when it determines the water system is eligible to commence reduced monitoring pursuant to this subsection. The Director shall review, and where appropriate, revise the determination when the CWS or NTNCWS submits new sampling or treatment data, or when other data relevant to the number and frequency of tap sampling becomes available.

c. A small or medium-size CWS or NTNCWS that meets the lead and copper action levels during three consecutive years of sampling may reduce the frequency of sampling for lead and copper from annually to once every three years. Any CWS or NTNCWS that maintains the range of values for the water quality control parameters reflecting optimal corrosion control treatment specified by the Director under § 705(F) during three consecutive years of sampling may request that the Director allow the CWS or NTNCWS to reduce the frequency of sampling from annually to once every three years if it receives written approval from the Director. The Director shall review monitoring, treatment, and other relevant information submitted by the CWS or NTNCWS in accordance with § 712, and shall notify the water system in writing when it determines the water system is eligible to reduce the frequency of monitoring to once every three years. The Director shall review, and where appropriate, revise the determination when the water system submits new sampling or treatment data, or when other data relevant to the number and frequency of tap sampling becomes available.

d. A CWS or NTNCWS that reduces the number and frequency of sampling shall collect these samples from representative sites included in the pool of targeted sampling sites identified in subsection (A) of this section. A CWS or NTNCWS sampling annually or less frequently shall conduct the lead and copper tap sampling during the months of June, July, August or September unless the Director has approved a different sampling period in accordance with subsection (D)(5)(d)(i) of this section.

i. The Director, at his/her discretion, may approve a different period for conducting the lead and copper tap sampling for water systems collecting a reduced number of samples. Such a period shall be no longer than four consecutive months and must represent a time of normal operation where the highest levels of lead are most likely to occur. For a NTNCWS that does not operate during the months of June through September, and for which the period of normal operation where the highest levels of lead are most likely to occur is not known, the Director shall designate a period that represents a time of normal operation for the water system.

ii. CWSs or NTNCWSs monitoring annually, that have been collecting samples during the months of June through September and that receive Director approval to alter their sample collection period under subsection (D)(5)(d)(i) of this section, must collect their next round of samples during a time period that ends no later than 21 months after the previous round of sampling. CWSs or NTNCWSs monitoring triennially that have been collecting samples during the months of June through September, and receive Director approval to alter the sampling collection period as per subsection (D)(5)(d)(i) of this section, must collect their next round of samples during a time period that ends no later than 45 months after the previous round of sampling. Subsequent rounds of sampling must be collected annually or triennially, as required by this section. Small CWSs or NTNCWSs with waivers, granted pursuant to subsection (G) of this section, that have been collecting samples during the months of June through September and receive Director approval to alter their sample collection period under subsection (D)(5)(d)(i) of this section must collect their next round of samples before the end of the 9-year period.

e. Any CWS or NTNCWS that demonstrates for two consecutive 6-month monitoring periods that the tap water lead level computed under § 703 (A)(3) is less than or equal to 0.005 mg/L and the tap water copper level computed under § 703(A)(3)(a) is less than or equal to 0.65 mg/L may reduce the number of samples in accordance with subsection (C) of this section and reduce the frequency of sampling to once every three calendar years.

f. A small or medium-size CWS or NTNCWS subject to reduced sampling that exceeds the lead or copper action level shall resume sampling in accordance with subsection (D)(4) of this section and collect the number of samples specified for standard

sampling under subsection (C) of this section. Such CWS or NTNCWS shall also conduct water quality parameter sampling in accordance with § 707(B), (C) or (D) (as appropriate) during the sampling period in which it exceeded that action level. Any CWS or NTNCWS may resume annual monitoring for lead and copper at the tap at the reduced number of sites specified in subsection (C) of this section after it has completed two subsequent consecutive six-month rounds of monitoring that meet the criteria of subsection (D)(5)(a) of this section and/or may resume triennial monitoring for lead and copper at the reduced number of sites after it demonstrates through subsequent rounds of monitoring that it meets the criteria of either subsection (D)(5)(c) or (D)(5)(e) of this section.

i. Any CWS or NTNCWS subject to the reduced monitoring frequency that fails to operate at or above the minimum value or within the range of values for the water quality parameters specified by the Director under § 705(F) for more than nine days in any six-month period specified in § 707(D) shall conduct tap water sampling for lead and copper at the frequency specified in subsection (D)(4) of this section, collect the number of samples specified for standard monitoring under subsection (C) of this section, and shall resume monitoring for water quality parameters within the distribution system in accordance with § 707 (D). Such a water system may resume reduced monitoring for lead and copper at the tap and for water quality parameters within the distribution system under the following conditions:

1. The CWS or NTNCWS may resume annual monitoring for lead and copper at the tap at the reduced number of sites specified in subsection (C) of this section after it has completed two subsequent six-month rounds of monitoring that meet the criteria of subsection (D)(5)(b) of this section and the water system has received written approval from the Director that it is appropriate to resume reduced monitoring on an annual frequency.

2. The CWS or NTNCWS may resume triennial monitoring for lead and copper at the tap at the reduced number of sites after it demonstrates through subsequent rounds of monitoring that it meets the criteria of either subsection (D)(5)(c) or (D)(5)(e) of this section and the water system has received written approval from the Director that it is appropriate to resume triennial monitoring.

3. The CWS or NTNCWS may reduce the number of water quality parameter tap water samples required in accordance with § 707(E)(1) and the frequency with which it collects such samples in accordance with § 707(E)(2). Such a CWS or NTNCWS may not resume triennial monitoring for water quality parameters at the tap until it demonstrates, in accordance with the requirements of § 707(E)(2), that it has re-qualified for triennial monitoring.

g. Any CWS or NTNCWS subject to a reduced monitoring frequency under subsection (D)(5) of this section that either adds a new source of water or changes any water treatment shall inform the Director in writing in accordance with § 712(A)(3). The Director may require the CWS or NTNCWS to resume sampling in accordance with subsection (D)(4) of this section and collect the number of samples specified for standard monitoring under subsection (C) of this section or take other appropriate steps such as increased water quality parameter monitoring or re-evaluation of its corrosion control treatment given the potentially different water quality considerations.

E. Additional sampling by CWSs or NTNCWSs. The results of any sampling conducted in addition to the minimum requirements of this section shall be considered by the CWS or NTNCWS and the Director in making any determinations (i.e., calculating the 90th percentile lead or copper level) under this section.

F. Invalidation of lead or copper tap water samples.

A sample invalidated under this subsection does not count toward determining lead or copper 90th percentile levels under § 703(A)(3) or toward meeting the minimum monitoring requirements of subsection (C) of this section.

1. The Director may invalidate a lead or copper tap water sample at least if one of the following conditions is met.

a. The laboratory establishes that improper sample analysis caused erroneous results.

b. The Director determines that the sample was taken from a site that did not meet the site selection criteria of this section.

c. The sample container was damaged in transit.

d. There is substantial reason to believe that the sample was subject to tampering.

2. The CWS or NTNCWS must report the results of all samples to the Director and all supporting documentation for samples the water system believes should be invalidated.

3. To invalidate a sample under subsection (F)(1) of this section, the decision and the rationale for the decision must be documented in writing. The Director may not invalidate a sample solely on the grounds that a follow-up sample result is higher or lower than that of the original sample.

4. The CWS or NTNCWS must collect replacement samples for any samples invalidated under this section if, after the invalidation of one or more samples, the water system has too few samples to meet the minimum requirements of subsection (C) of this section. Any such replacement samples must be taken as soon as possible, but no later than 20 days after the date the Director invalidates the sample or by the end of the applicable monitoring period, whichever occurs later. Replacement samples taken after the end of the applicable monitoring period shall not also be used to meet the monitoring requirements of a subsequent monitoring period. The replacement samples shall be taken at the same locations as the invalidated samples or, if that is not possible, at locations other than those already used for sampling during the monitoring period.

G. Monitoring waivers for small CWSs or NTNCWSs.

Any small CWS or NTNCWS that meets the criteria of this subsection may apply to the Director to reduce the frequency of monitoring for lead and copper under this section to once every nine years (i.e., a "full waiver") if it meets all of the materials criteria specified in subsection (G)(1) of this section and all of the monitoring criteria specified in subsection (G)(2) of this section. If these regulations permit, any small CWS or NTNCWS that meets the criteria in subsections (G)(1) and (2) of this section only for lead, or only for copper, may apply to the Director for a waiver to reduce the frequency of tap water monitoring to once every nine years for that contaminant only (i.e., a "partial waiver").

1. Materials criteria.

The CWS or NTNCWS must demonstrate that its distribution system and service lines and all drinking water supply plumbing, including plumbing conveying drinking water within all residences and buildings connected to the water system, are free of lead-containing materials and/or copper-containing materials, as those terms are defined in this subsection, as follows:

a. Lead.

To qualify for a full waiver, or a waiver of the tap water monitoring requirements for lead (i.e., a "lead waiver"), the water system must provide certification and supporting documentation to the Director that the water system is free of all lead-containing materials, as follows:

i. It contains no plastic pipes which contain lead plasticizers, or plastic service lines which contain lead plasticizers; and

ii. It is free of lead service lines, lead pipes, lead soldered pipe joints, and leaded brass or bronze alloy fittings and fixtures, unless such fittings and fixtures meet the specifications of any standard established pursuant to §2521 of the NNSDWA.

b Copper.

To qualify for a full waiver, or a waiver of the tap water monitoring requirements for copper (i.e., a "copper waiver"), the water system must provide certification and supporting documentation to the Director that the water system contains no copper pipes or copper service lines.

2. Monitoring criteria for waiver issuance.

The CWS or NTNCWS must have completed at least one 6-month round of standard tap water monitoring for lead and copper at sites approved by the Director and from the number of sites required by subsection (C) of this section and demonstrate that the 90th percentile levels for any and all rounds of monitoring conducted since the water system became free of all lead-containing and/or copper-containing materials, as appropriate, meet the following criteria.

a. Lead levels. To qualify for a full waiver, or a lead waiver, the CWS or NTNCWS must demonstrate that the 90th percentile lead level does not exceed 0.005 mg/L.

b. Copper levels. To qualify for a full waiver, or a copper waiver, the CWS or NTNCWS must demonstrate that the 90th percentile copper level does not exceed 0.65 mg/L.

3. Director approval of waiver application.

The Director shall notify the CWS or NTNCWS of its waiver determination, in writing, setting forth the basis of the decision and any condition of the waiver. As a condition of the waiver, the Director may require the water system to perform specific activities (e.g., limited monitoring, periodic outreach to customers to remind them to avoid installation of materials that might void the waiver) to avoid the risk of lead or copper concentration of concern in tap water. The small CWS or NTNCWS must continue monitoring for lead and copper at the tap as required by subsections (D)(1) through (D)(4) of this section, as appropriate, until it receives written notification from the Director that the waiver has been approved.

4. Monitoring frequency for CWSs or NTNCWSs with waivers.

a. A CWS or NTNCWS with a full waiver must conduct tap water monitoring for lead and copper in accordance with subsection (D)(5)(d) of this section at the reduced number of sampling sites identified in subsection (C) of this section at least once every nine years and provide the materials certification specified in subsection (G)(1) of this section for both lead and copper to the Director along with the monitoring results.

b. A CWS or NTNCWS with a partial waiver must conduct tap water monitoring for the waived contaminant in accordance with subsection (D)(5)(d) of this section at the reduced number of sampling sites specified in subsection (C) of this section at least once every nine years and provide the materials certification specified in subsection (G)(1) of this section pertaining to the waived contaminant along with the monitoring results. Such a water system also must continue to monitor for the non-waived contaminant in accordance with requirements of subsections (D)(1) through (D)(5) of this section, as appropriate.

c. If a CWS or NTNCWS with a full or partial waiver adds a new source of water or changes any water treatment, the water system must notify the Director in writing within sixty days of the change in accordance with § 712(A)(3). The Director has the authority to require the water system to add or modify waiver conditions (e.g., require re-certification that the water system is free of lead-containing and/or copper-containing materials, require additional round(s) of monitoring), if it deems such modifications are necessary to address treatment or source water changes at the water system.

d. If a CWS or NTNCWS with a full or partial waiver becomes aware that it is no longer free of lead-containing or copper-containing materials, as appropriate, (e.g., as a result of new construction or repairs), the water system shall notify the Director in writing no later than 60 days after becoming aware of such a change.

5. Continued eligibility.

If the CWS or NTNCWS continues to satisfy the requirements of subsection (G)(4) of this section, the waiver will be renewed automatically, unless any of the conditions listed in subsections (G)(5)(a) through (G)(5)(c) of this section occurs. A water system whose waiver has been revoked may re-apply for a waiver at such time as it again meets the appropriate materials and monitoring criteria of subsections (G)(1) and (G)(2) of this section.

A CWS or NTNCWS with a full waiver or a lead waiver no longer satisfies the materials criteria of subsection (G)(1)(a) of this section or has a 90th percentile lead level greater than 0.005 mg/L.

b. A CWS or NTNCWS with a full waiver or a copper waiver no longer satisfies the materials criteria of subsection (G)(1)(b) of this section or has a 90th percentile copper level greater than 0.65 mg/L.

c. The Director notifies the CWS or NTNCWS, in writing, that the waiver has been revoked, setting forth the basis of the decision.

6. Requirements following waiver revocation.

A CWS or NTNCWS whose full or partial waiver has been revoked by the Director is subject to the corrosion control treatment and lead and copper tap water monitoring requirements, as follows:

a. If the CWS or NTNCWS exceeds the lead and/or copper action level, the water system must implement corrosion control treatment in accordance with the deadlines specified in § 706(E), and any other applicable requirements of this part.

b. If the CWS or NTNCWS meets both the lead and the copper action level, the water system must monitor for lead and copper at the tap no less frequently than once every three years using the reduced number of sample sites specified in subsection (C) of this section.

7. Pre-existing waivers.

Small CWS or NTNCWS waivers approved by the Director in writing prior to the promulgation of these regulations shall remain in effect under the following conditions:

a. If the CWS or NTNCWS has demonstrated that it is both free of lead-containing and copper-containing materials, as required by subsection (G)(1) of this section and that its 90th percentile lead levels and 90th percentile copper levels meet the criteria of subsection (G)(2) of this section, the waiver remains in effect so long as the water system continues to meet the waiver eligibility criteria of subsection (G)(5) of this section. The first round of tap water monitoring conducted pursuant to subsection (G)(4) of this section shall be completed no later than nine years after the last time the water system has monitored for lead and copper at the tap.

b. If the CWS or NTNCWS has met the materials criteria of subsection (G)(1) of this section but has not met the monitoring criteria of subsection (G)(2) of this section, the water system shall conduct a round of monitoring for lead and copper at the tap demonstrating that it meets the criteria of subsection (G)(2) of this section no later than September 30, 2000. Thereafter, the waiver shall remain in effect as long as the water system meets the continued eligibility criteria of subsection (G)(5) of this section. The first round of tap water monitoring conducted pursuant to subsection (G)(4) of this section shall be completed no later than nine years after the round of monitoring conducted pursuant to subsection (G)(2) of this section.

§ 705 DESCRIPTION OF CORROSION CONTROL TREATMENT REQUIREMENTS

Each CWS or NTNCWS shall complete the corrosion control treatment requirements described below which are applicable to such CWS or NTNCWS under § 706.

A. CWS or NTNCWS recommendation regarding corrosion control treatment.

1. Based upon the results of lead and copper tap sampling and water quality parameter sampling, small and medium-size CWS or NTNCWS exceeding the lead or copper action level shall recommend installation of one or more of the corrosion control treatments listed in subsection (C)(1) of this section which the CWS or NTNCWS believes constitutes optimal corrosion control for that CWS or NTNCWS.

2. The Director may require the CWS or NTNCWS to conduct additional water quality parameter sampling in accordance with § 707(B) to assist the Director in reviewing the CWS's or NTNCWS's recommendation.

B. Director-decision to require studies of corrosion control treatment (applicable to small and medium-size CWSs or NTNCWSs).

1. The Director may require any small and medium-size CWS or NTNCWS that exceeds the lead or copper action level to perform corrosion control studies under subsection (C) of this section to identify optimal corrosion control treatment for the CWS or NTNCWS.

C. Performance of corrosion control studies.

1. Any CWS or NTNCWS performing corrosion control studies shall evaluate the effectiveness of each of the following treatments, and, if appropriate, combinations of the following treatments to identify the optimal corrosion control treatment for that CWS or NTNCWS:

   a. Alkalinity and pH adjustment;

   b. Calcium hardness adjustment; and

   c. The addition of a phosphate or silicate based corrosion inhibitor at a concentration sufficient to maintain an effective residual concentration in all test tap samples.

2. The CWS or NTNCWS shall evaluate each of the corrosion control treatments using either pipe rig/loop tests, metal coupon tests, partial- system tests, or analyses based on documented analogous treatments with other CWSs or NTNCWSs of similar size, water chemistry and distribution system configuration.

3. The CWS or NTNCWS shall measure the following water quality parameters in any tests conducted under this subsection before and after evaluating the corrosion control treatments listed above:

   a. Lead;
   b. Copper;
   c. pH;
   d. Alkalinity;
   e. Calcium;
   f. Conductivity;
   g. Orthophosphate (when an inhibitor containing a phosphate compound is used);
   h. Silicate (when an inhibitor containing a silicate compound is used);
   i. Water temperature.

4. The CWS or NTNCWS shall identify all chemical or physical constraints that limit or prohibit the use of a particular corrosion control treatment and document such constraints with at least one of the following:

   a. Data and documentation showing that a particular corrosion control treatment has adversely affected other water treatment processes when used by another CWS or NTNCWS with comparable water quality characteristics; and/or

   b. Data and documentation demonstrating that the CWS or NTNCWS has previously attempted to evaluate a particular corrosion control treatment and has found that the treatment is ineffective or adversely affects other water quality treatment processes.

5. The CWS or NTNCWS shall evaluate the effect of the chemicals used for corrosion control treatment on other water quality treatment processes.

6. On the basis of an analysis of the data generated during each evaluation, the CWS or NTNCWS shall recommend to the Director in writing the treatment option that the corrosion control studies indicate constitutes optimal corrosion control treatment for that CWS or NTNCWS. The CWS or NTNCWS shall provide a rationale for its recommendation along with all supporting documentation specified in subsections (C)(1) through (5) of this section.

D. Director's designation of optimal corrosion control treatment.

1. Based upon consideration of available information including, where applicable, studies performed under subsection (C) of this section and a CWS's or NTNCWS's recommended treatment alternative, the Director shall either approve the corrosion control treatment option recommended by the CWS or NTNCWS or designate alternative corrosion control treatment(s) from among those listed in subsection (C)(1) of this section. When designating optimal treatment, the Director shall consider the effects that additional corrosion control

treatment will have on water quality parameters and on other water quality treatment processes.

2. The Director shall notify the CWS or NTNCWS of the decision on optimal corrosion control treatment in writing and explain the basis for this determination. If the Director requests additional information to aid the review, the CWS or NTNCWS shall provide the information.

E. Installation of optimal corrosion control. Each CWS or NTNCWS shall properly install and operate throughout its distribution system the optimal corrosion control treatment designated by the Director under subsection (D) of this section.

F. Director's review of treatment and specification of optimal water quality control parameters. The Director shall evaluate the results of all lead and copper tap samples and water quality parameter samples submitted by the CWS or NTNCWS and determine whether the CWS or NTNCWS has properly installed and operated the optimal corrosion control treatment designated by the Director in subsection (D) of this section. Upon reviewing the results of tap water and water quality parameter sampling by the CWS or NTNCWS, both before and after the CWS or NTNCWS installs optimal corrosion control treatment, the Director shall designate:

1. A minimum value or a range of values for pH measured at each entry point to the distribution system;

2. A minimum pH value, measured in all tap samples. Such value shall be equal to or greater than 7.0, unless the Director determines that meeting a pH level of 7.0 is not technologically feasible or is not necessary for the CWS or NTNCWS to optimize corrosion control;

3. If a corrosion inhibitor is used, a minimum concentration or a range of concentrations for the inhibitor, measured at each entry point to the distribution system and in all tap samples, that the Director determines is necessary to form a passivating film on the interior walls of the pipes of the distribution system;

4. If alkalinity is adjusted as part of optimal corrosion control treatment, a minimum concentration or a range of concentrations for alkalinity, measured at each entry point to the distribution system and in all tap samples;

5. If calcium carbonate stabilization is used as part of corrosion control, a minimum concentration or a range of concentrations for calcium, measured in all tap samples.

The values for the applicable water quality control parameters listed above shall be those that the Director determines to reflect optimal corrosion control treatment for the CWS or NTNCWS. The Director may designate values for additional water quality control parameters to reflect optimal corrosion control for the CWS or NTNCWS. The Director shall notify the CWS or NTNCWS in writing of the determinations and explain the basis for the decisions.

G. Continued Operation and Sampling. All CWSs or NTNCWSs optimizing corrosion control shall continue to operate and maintain optimal corrosion control treatment, including maintaining water quality parameters at or above minimum values or within ranges designated by the Director under subsection (F) of this section, in accordance with this subsection for all samples collected under § 707(D)-(F). Compliance with the requirements of this subsection shall be determined every six months, as specified under § 707(D). A water system is out of compliance with the requirements of this subsection for a six-month period if it has excursions for any NNEPA-specified parameter on more than nine days during the period. An excursion occurs whenever the daily value for one or more of the water quality parameters measured at a sampling location is below the minimum value or outside the range designated by the Director. Daily values are calculated as follows. The Director will have discretion to delete results of obvious sampling errors from this calculation.

1. On days when more than one measurement for the water quality parameter is collected at the sampling location, the daily value shall be the average of all results collected during the day regardless of whether they are collected through continuous monitoring, grab sampling, or a combination of both. If EPA has approved an alternative formula under 40 CFR §142.16 in the state/tribe's application for a program revision submitted pursuant to 40 CFR §142.12, the state/tribe's formula shall be used to aggregate multiple measurements taken at a sampling point for the water quality parameter in lieu of the formula in this subsection.

2. On days when only one measurement for the water quality parameter is collected at the sampling location, the daily value shall be the result of that measurement.

3. On days when no measurement is collected for the water quality parameter at the sampling location, the daily value shall be the daily value calculated on the most recent day on which the water quality parameter was measured at the sample site.

H. Modification of the Director's treatment decision.

Upon the Director's initiative or in response to a request by a CWS or NTNCWS or other interested party, the Director may modify a determination of the optimal corrosion control treatment under subsection (D) of this section or optimal water quality control parameters under subsection (F) of this section.

A request for modification by a CWS or NTNCWS or other interested party shall be in writing, explain why the modification is appropriate, and provide supporting documentation.

The Director may modify a determination where the Director concludes that such change is necessary to ensure that the CWS or NTNCWS continues to optimize corrosion control treatment.

A revised determination shall be made in writing, set forth the new treatment requirements, explain the basis for the Director's decision, and provide an implementation schedule for completing the treatment modifications.

I. Treatment decisions by EPA in lieu of the Director.

Pursuant to the procedures in 40 CFR § 142.19, the EPA Regional Administrator may review treatment determinations made by the Director under subsections (D), (F), or (H) of this section and issue federal treatment determinations consistent with the requirements of those subsections where the Regional Administrator finds that:

1. The Director has failed to issue a treatment determination by the applicable deadlines contained in § 706;

2. The Director has abused his/her discretion in a substantial number of cases or in cases affecting a substantial population; or

3. The technical aspects of the Director's determination would be indefensible in an expected Federal enforcement action taken against a CWS or NTNCWS.

§ 706 APPLICABILITY OF CORROSION CONTROL TREATMENT STEPS TO SMALL, MEDIUM-SIZE AND LARGE PUBLIC WATER SYSTEM

A. Public water system, CWSs and NTNCWSs, shall complete the applicable corrosion control treatment requirements described in § 705 by the deadlines established in this section.

1. A large CWS or NTNCWS (serving >50,000 persons) shall complete the corrosion control treatment steps specified in subsection (D) of this section, unless it is deemed to have optimized corrosion control under subsection (B)(2) or (B)(3) of this section.

2. A small CWS or NTNCWS (serving ≤3,300 persons) and medium-size CWS or NTNCWS (serving >3,300 and ≤50,000 persons) shall complete the corrosion control treatment steps specified in subsection (E) of this section, unless it is deemed to have optimized corrosion control under subsection (B)(1), (B)(2), or (B)(3) of this section.

B. Any CWS or NTNCWS deemed to have optimized corrosion control under this section, and which has treatment in place, shall continue to operate and maintain optimal corrosion control treatment and meet any requirements that the Director determines appropriate to ensure optimal corrosion control treatment is maintained.

A CWS or NTNCWS is deemed to have optimized corrosion control and is not required to complete the applicable corrosion control treatment steps identified in this section if the CWS or NTNCWS satisfies one of the following criteria:

1. A small or medium-size CWS or NTNCWS is deemed to have optimized corrosion control if the CWS or NTNCWS meets the lead and copper action levels during each of two consecutive six-month sampling periods conducted in accordance with § 704.

2. Any CWS or NTNCWS may be deemed, by the Director, to have optimized corrosion control treatment if the CWS or NTNCWS demonstrates to the satisfaction of the Director that it

has conducted activities equivalent to the corrosion control steps applicable to such CWS or NTNCWS under this section.

If the Director makes this determination, a written notice explaining the basis for the decision will be provided and shall specify the water quality control parameters representing optimal corrosion control in accordance with § 705(F).

CWS or NTNCWS deemed to have optimized corrosion control under this subsection shall operate in compliance with the NNEPA-designated optimal water quality control parameters in accordance with § 705(G) and continue to conduct lead and copper tap and water quality parameter sampling in accordance with §§704(D)(4) and 707(D), respectively.

A CWS or NTNCWS shall provide the Director with the following information in order to support a determination under this subsection:

a. The results of all test samples collected for each of the water quality parameters in § 705(C)(3);

b. A report explaining the test methods used by the CWS or NTNCWS to evaluate the corrosion control treatments listed in § 705(C)(1), the results of all tests conducted, and the basis for the CWS or NTNCWS's selection of optimal corrosion control treatment;

c. A report explaining how corrosion control has been installed and how it is being maintained to insure minimal lead and copper concentrations at consumers' taps; and

d. The results of tap water samples collected in accordance with § 704 at least once every six months for one year after corrosion control has been installed.

3. Any CWS or NTNCWS is deemed to have optimized corrosion control if it submits results of tap water sampling conducted in accordance with § 704 and source water sampling conducted in accordance with § 708 that demonstrates for two consecutive six-month sampling periods that the difference between the 90th percentile tap water lead level computed under § 703(A)(3), and the highest source water lead concentration, is less than the Practical Quantitation Level (PQL) for lead specified in Appendix C 701-C (A)(1)(b).

a. Those CWS or NTNCWS whose highest source water lead level is below the Method Detection Limit may also be deemed to have optimized corrosion control under this subsection if the 90th percentile tap water lead level is less than or equal to the PQL for lead for two consecutive 6-month monitoring periods.

b. Any CWS or NTNCWS deemed to have optimized corrosion control in accordance with this subsection shall continue monitoring for lead and copper at the tap no less frequently than once every three calendar years using the reduced number of sites specified in § 704(C) and collecting the samples at times and locations specified in § 704 (D)(5)(d).

Any such CWS or NTNCWS that has not conducted a round of monitoring pursuant to § 704(D) since September 30, 1997, shall complete a round of monitoring pursuant to this section no later than September 30, 2000.

c. Any CWS or NTNCWS deemed to have optimized corrosion control pursuant to this subsection shall notify the Director in writing pursuant to § 712(A)(3) of any change in treatment or the addition of a new source. The Director may require any such CWS or NTNCWS to conduct additional monitoring or to take other action the Director deems appropriate to ensure that such CWS or NTNCWS maintain minimal levels of corrosion in the distribution system.

d. Upon promulgation of these regulations, a CWS or NTNCWS is not deemed to have optimized corrosion control under this subsection, and shall implement corrosion control treatment pursuant to subsection (B)(3)(e) of this section unless it meets the copper action level.

e. Any CWS or NTNCWS triggered into corrosion control because it is no longer deemed to have optimized corrosion control under this subsection shall implement corrosion control treatment in accordance with the deadlines in subsection (E) of this section.

Any such large CWS or NTNCWS shall adhere to the schedule specified in that subsection for medium-size CWS or NTNCWS, with the time periods for completing each step being triggered by the date the water system is no longer deemed to have optimized corrosion control under this subsection.

C. Any small or medium-size CWS or NTNCWS that is required to complete the corrosion control steps due to its exceedance of the lead or copper action level may cease completing the treatment steps whenever the CWS or NTNCWS meets both action levels during each of the two consecutive sampling periods conducted pursuant to § 704 and submits the results to the Director.

If any such CWS or NTNCWS, thereafter, exceeds the lead or copper action level during any sampling period, the CWS or NTNCWS shall recommence completion of the applicable treatment steps, beginning with the first treatment step which was not previously completed in its entirety.

The Director may require a CWS or NTNCWS to repeat treatment steps previously completed by the CWS or NTNCWS where the Director determines that this is necessary to implement properly the treatment requirements of this section.

The Director shall notify the CWS or NTNCWS in writing of such a determination and explain the basis for the decision.

The requirement for any small or medium-size CWS or NTNCWS to implement corrosion control treatment steps in accordance with subsection (E) of this section (including CWS or NTNCWSs deemed to have optimized corrosion control under subsection (B)(1) of this section) is triggered whenever any small- or medium-size CWS or NTNCWS exceeds the lead or copper action level.

D. Treatment steps and deadlines for large CWSs or NTNCWSs. Except as provided in subsection (B)(2) and (3) of this section, large CWSs or NTNCWSs shall complete the following corrosion control treatment steps (described in the referenced portions of §§ 705, 704, and 707) by the indicated dates.

1. Step 1: The CWS or NTNCWS shall conduct initial sampling §§ 704(D)(1) and 707(B) during two consecutive six-month sampling periods by January 1, 1993.

2. Step 2: The CWS or NTNCWS shall complete corrosion control studies (§ 705(C)) by July 1, 1994.

3. Step 3: The Director shall designate optimal corrosion control treatment (§ 705(D)) by January 1, 1995.

4. Step 4: The CWS or NTNCWS shall install optimal corrosion control treatment (§ 705(E)) by January 1, 1997.

5. Step 5: The CWS or NTNCWS shall complete follow-up sampling (§§ 704(D)(3) and 707(C)) by January 1, 1998.

6. Step 6: The Director shall review installation of treatment and designate optimal water quality control parameters (§ 705(F)) by July 1, 1998.

7. Step 7: The CWS or NTNCWS shall operate in compliance with the Director-specified optimal water quality control parameters (§ 705(G)) and continue to conduct tap sampling (§§ 704(D)(4) and 707(D)).

E. Treatment Steps and deadlines for small and medium-size CWSs or NTNCWSs. Except as provided in subsection (B) of this section, small and medium-size CWSs or NTNCWSs shall complete the following corrosion control treatment steps (described in the referenced portions of §§ 705, 704, and 707) by the indicated time periods.

1. Step 1: The CWS or NTNCWS shall conduct initial tap sampling (§§704(D)(1) and 707(B)) until the CWS or NTNCWS either exceeds the lead or copper action level or becomes eligible for reduced sampling under §704 (D)(5). A CWS or NTNCWS exceeding the lead or copper action level shall recommend optimal corrosion control treatment (§705(A)) within six months after it exceeds one of the action levels.

2. Step 2: Within 12 months after a CWS or NTNCWS exceeds the lead or copper action level, the Director may require the CWS or NTNCWS to perform corrosion control studies (§ 705(B)). If the Director does not require the CWS or NTNCWS to perform such studies, the Director

shall specify optimal corrosion control treatment (§ 705(D)) within the following timeframes:

a. for medium-size CWSs or NTNCWSs, within 18 months after such CWS or NTNCWS exceeds the lead or copper action level.

b. for small CWS or NTNCWSs, within 24 months after such CWS or NTNCWS exceeds the lead or copper action level.

3. Step 3: If the Director requires a CWS or NTNCWS to perform corrosion control studies under Step 2, the CWS or NTNCWS shall complete the studies (§ 705(C)) within 18 months after the Director requires that such studies be conducted.

4. Step 4: If the CWS or NTNCWS has performed corrosion control studies under Step 2, the Director shall designate optimal corrosion control treatment (§ 705(D)) within 6 months after completion of Step 3.

5. Step 5: The CWS or NTNCWS shall install optimal corrosion control treatment (§ 705(E)) within 24 months after the Director designates such treatment.

6. Step 6: The CWS or NTNCWS shall complete follow-up sampling (§§ 704(D)(3) and 707(C)) within 36 months after the Director designates optimal corrosion control treatment.

7. Step 7: The Director shall review the CWS's or NTNCWS's installation of treatment and designate optimal water quality control parameters (§ 705(F)) within 6 months after completion of Step 6.

8. Step 8: The CWS or NTNCWS shall operate in compliance with the Director-designated optimal water quality control parameters (§ 705(G)) and continue to conduct tap sampling (§§ 704(D)(4) and 707(D)).

§ 707 SAMPLING REQUIREMENTS FOR WATER QUALITY PARAMETERS

All large CWSs or NTNCWSs and all small and medium-size CWSs or NTNCWSs that exceed the lead or copper action level shall sample water quality parameters in addition to lead and copper in accordance with this section. The requirements of this section are summarized in the table at the end of this section.

A. General Requirements:

1. Sample collection methods.

a. Tap samples shall be representative of water quality throughout the distribution system taking into account the number of persons served, the different sources of water, the different treatment methods employed by the CWS or NTNCWS, and seasonal variability. Tap sampling under this section is not required to be conducted at taps targeted for lead and copper sampling under § 704(A). [Note: CWSs or NTNCWSs may find it convenient to conduct tap sampling for water quality parameters at sites used for coliform sampling under § 404.]

b. Samples collected at the entry point(s) to the distribution CWS or NTNCWS shall be from locations representative of each source after treatment. If a CWS or NTNCWS draws water from more than one source and the sources are combined before distribution, the CWS or NTNCWS must sample at an entry point to the distribution system during periods of normal operating conditions (i.e., when water is representative of all sources being used).

2. Number of samples.

a. Except as provided in subsection (C)(3) of this section, CWSs or NTNCWSs shall collect two samples for each applicable water quality parameter at each entry point to the distribution system during each sampling period specified under subsections (B) of this section from the following number of sites.

TABLE 700.2 WATER QUALITY PARAMETER SAMPLING SITE

System size (# of people served)	# of sites for water quality parameters

>100,000	25
10,001 to 100,000	10
3,301 to 10,000	3
501 to 3,300	2
101 to 500	1
≤100	1

b. CWSs or NTNCWSs shall collect two samples for each applicable water quality parameter at each entry point to the distribution system during each sampling period specified in subsection (B) of this section. During each sampling period specified in subsections (C) through (E) of this section, CWSs or NTNCWSs shall collect one sample for each applicable water quality parameter at each entry point to the distribution system.

B. Initial sampling. All large CWSs or NTNCWSs shall measure the applicable water quality parameters as specified below at taps and at each entry point to the distribution system during each six-month sampling period specified in § 704(D)(2). All small and medium-size CWSs or NTNCWSs shall measure the applicable water quality parameters at the locations specified below during each six-month sampling period specified in §704(D)(2) during which the CWS or NTNCWS exceeds the lead or copper action level.

1. At taps:

a. pH;
b. Alkalinity;
c. Orthophosphate, when an inhibitor containing a phosphate compound is used;
d. Silica, when an inhibitor containing a silicate compound is used;
e. Calcium;
f. Conductivity; and
g. Water temperature.

2. At each entry point to the distribution system: all of the applicable parameters listed in subsection (B)(1) of this section.

C. Sampling after installation of corrosion control. Any large CWS or NTNCWS which installs optimal corrosion control treatment pursuant to § 706(D)(4) shall measure the water quality parameters at the locations and frequencies specified below during each six-month sampling period specified in § 704(D)(3)(a). Any small or medium-size CWS or NTNCWS which installs optimal corrosion control treatment shall conduct such sampling during each six-month sampling period specified in § 704 (D)(3)(b) in which the CWS or NTNCWS exceeds the lead or copper action level.

1. At taps, two samples for:

a. pH;
b. Alkalinity;
c. Orthophosphate, when an inhibitor containing a phosphate compound is used;
d. Silica, when an inhibitor containing a silicate compound is used; and
e. Calcium, when calcium carbonate stabilization is used as part of corrosion control.

2. Except as provided in subsection (C)(3) of this section, at each entry point to the distribution system, at least one sample no less frequently than every two weeks (biweekly) for:

a. pH;
b. When alkalinity is adjusted as part of optimal corrosion control, a reading of the dosage rate of the chemical used to adjust alkalinity, and the alkalinity concentration; and
c. When a corrosion inhibitor is used as part of the optimal corrosion control, a reading of the dosage rate of the inhibitor used, and the concentration of orthophosphate or silica (whichever is applicable).

3. Any ground water system can limit entry point sampling described in subsection (C)(2) of this section to those entry points that are representative of water quality and treatment

conditions throughout the water system. If water from untreated ground water sources mixes with water from treated ground water sources, the water system must monitor for water quality parameters both at representative entry points receiving treatment and representative entry points receiving no treatment. Prior to the start of any monitoring under this subsection, the water system shall provide to the Director written information identifying the selected entry points and documentation, including information on seasonal variability, sufficient to demonstrate that the sites are representative of water quality and treatment conditions throughout the water system.

D. Sampling after the Director specifies water quality parameter values for optimal corrosion control. After the Director specifies the values for applicable water quality control parameters reflecting optimal corrosion control treatment under §705(F), all large CWS or NTNCWSs shall measure the applicable water quality parameters in accordance with subsection (C) of this section and determine compliance with the requirements of § 705(G) every six months with the first six-month period to begin on the date the Director specifies the optimal values under § §705(F). Any small or medium-size CWS or NTNCWS shall conduct such sampling during each six-month period specified in this subsection in which the CWS or NTNCWS exceeds the lead or copper action level. For any such small and medium-size CWSs or NTNCWSs that is subject to a reduced monitoring frequency pursuant to § 704 (D)(5 at the time of the action level exceedance, the end of the applicable six-month period under this subsection shall coincide with the end of the applicable monitoring period under § 704 (D)(5). Compliance with Director-designated optimal water quality parameter values shall be determined as specified under § 705(G).

E. Reduced Sampling.

1. Any CWS or NTNCWS that maintains the range of values for the water quality parameters reflecting optimal corrosion control treatment during each of two consecutive six-month sampling periods under subsection (D) of this section shall continue sampling at the entry point(s) to the distribution system as specified in subsection (C)(2) of this section. Such CWS or NTNCWS may collect two tap samples for applicable water quality parameters from the following reduced number of sites during each six-month sampling period.

TABLE 700.3 REDUCED SAMPLING

System size (# of people served)	Reduced # of sites for water quality parameters
>100,000	10
10,001 to 100,000	7
3,301 to 10,000	3
501 to 3,300	2
101 to 500	1
≤100	1

2. a. Any CWS or NTNCWS that maintains the range of values for the water quality parameters reflecting optimal corrosion control treatment specified by the Director under § 705(F) during three consecutive years of sampling may reduce the frequency with which it collects the number of tap samples for applicable water quality parameters specified in subsection (E)(1) of this section from every six months to annually. Any water system that maintains the range of values for the water quality parameters reflecting optimal corrosion control treatment specified by the Director under §§705 (F) during three consecutive years of annual sampling under this subsection may reduce the frequency with which it collects the number of tap samples for applicable water quality parameters specified in subsection (E)(1) of this section from annually to every three years.

b. A CWS or NTNCWS may reduce the frequency with which it collects tap samples for applicable water quality parameters specified in subsection (E)(1) of this section to every three years if it demonstrates during two consecutive monitoring periods that its tap water lead level at the 90th percentile is less than or equal to the PQL for lead specified in Appendix C -Lead/Copper, that its tap water copper level at the 90th percentile is less than or equal to 0.65 mg/L for copper in §703(A)(2),

and that it also has maintained the range of values for the water quality parameters reflecting optimal corrosion control treatment specified by the Director under § 705(F).

3. A CWS or NTNCWS that conducts sampling annually shall collect these samples evenly throughout the year so as to reflect seasonal variability.

4. Any CWS or NTNCWS subject to reduced sampling frequency that fails to operate at or above the minimum value or within the range of values for the water quality parameters specified by the Director under § 705(F) for more than nine days in any six-month period specified in § 705(G) shall resume distribution system tap water sampling in accordance with the number and frequency requirements in subsection (D) of this section. Such a water system may resume annual monitoring for water quality parameters at the tap at the reduced number of sites specified in subsection (E)(1) of this section after it has completed two subsequent consecutive six-month rounds of monitoring that meet the criteria of that subsection and/or may resume triennial monitoring for water quality parameters at the tap at the reduced number of sites after it demonstrates through subsequent rounds of monitoring that it meets the criteria of either subsection (E)(2)(a) or (E)(2)(b) of this section.

F. Additional sampling by CWSs or NTNCWSs. The results of any sampling conducted in addition to the minimum requirements of this section shall be considered by the public water system and the Director in making any determinations (i.e., determining concentrations of water quality parameters) under this section or § 705.

TABLE 700.4 SUMMARY SAMPLING REQUIREMENTS FOR WATER QUALITY PARAMETERS[1]

SAMPLING PERIOD	PARAMETERS[2]	LOCATION	FREQUENCY
Initial Sampling	pH, alkalinity, orthophosphate or silica[3], calcium, conductivity, temperature	Taps and at entry point(s) to distribution system.	Every 6 months
After installation of Corrosion Control	pH, alkalinity, orthophosphate or silica[3], calcium[4]	Taps	Every 6 months
	pH, alkalinity dosage rate and concentration (if alkalinity adjusted as part of corrosion control), inhibitor dosage rate and inhibitor residual[5].	Entry point(s) to distribution system.	No less frequently than every two weeks.
After Director Specifies Parameter Values for Optimal Corrosion Control	pH, alkalinity, orthophosphate or silica[3], calcium[4]	Taps	Every 6 months
	pH, alkalinity dosage rate and concentration (if alkalinity adjusted as part of corrosion control), inhibitor dosage rate and inhibitor residual[5].	Entry point(s) to distribution system[6].	No less frequently than every two weeks.
Reduced Sampling	pH, alkalinity, orthophosphate or silica[3], calcium[4]	Taps	Every 6 months annually[7] or every 3 years[8] reduced number of sites.
	pH, alkalinity dosage rate and concentration (if alkalinity adjustment as part of corrosion control), inhibitor dosage rate and inhibitor residual[5].	Entry point(s) to distribution system[6].	No less frequently than every two weeks.

[1] Table is for illustrative purposes; consult the text of this section for precise regulatory requirements.
[2] Small and medium-size CWS or NTNCWSs have to sample for water quality parameters only during sampling periods in which the CWS or NTNCWS exceeds the lead or copper action level.
[3] Orthophosphate must be measured only when an inhibitor containing a phosphate compound is used. Silica must be measured only when an inhibitor containing a silicate compound is used.

[4] Calcium must be measured only when calcium carbonate stabilization is used as part of corrosion control.
[5] Inhibitor dosage rates and inhibitor residual concentrations (orthophosphate or silica) must be measured only when an inhibitor is used.
[6] Ground water systems may limit monitoring to representative locations throughout the water system.
[7] Water systems may reduce frequency of monitoring for water quality parameters at the tap from every six months to annually if they have maintained the range of values for water quality parameters reflecting optimal corrosion control during 3 consecutive years of monitoring.
[8] Water systems may further reduce the frequency of monitoring for water quality parameters at the tap from annually to once every 3 years if they have maintained the range of values for water quality parameters reflecting optimal corrosion control during 3 consecutive years of annual monitoring. Water systems may accelerate to triennial monitoring for water quality parameters at the tap if they have maintained 90th percentile lead levels less than or equal to 0.005 mg/L, 90th percentile copper levels less than or equal to 0.65 mg/L, and the range of water quality parameters designated by the Director under § 705(F) as representing optimal corrosion control during two consecutive six-month monitoring periods.

§ 708 SAMPLING REQUIREMENTS FOR LEAD AND COPPER IN SOURCE WATER

A. Sample location, collection methods, and number of samples.

1. A CWS or NTNCWS that fails to meet the lead or copper action level on the basis of tap samples collected in accordance with § 704 shall collect lead and copper source water samples in accordance with the following requirements regarding sample location, number of samples, and collection methods:

a. Groundwater systems shall take a minimum of one sample at every entry point to the distribution system which is representative of each well after treatment (hereafter called a sampling point). The water system shall take one sample at the same sampling point unless conditions make another sampling point more representative of each source or treatment plant.

b. Surface water systems shall take a minimum of one sample at every entry point to the distribution system after any application of treatment or in the distribution system at a point which is representative of each source after treatment (hereafter called a sampling point). The water system shall take each sample at the same sampling point unless conditions make another sampling point more representative of each source or treatment plant.

NOTE: For the purposes of this subsection, surface water systems include water systems with a combination of surface and ground sources.

c. If a water system draws water from more than one source and the sources are combined before distribution, the water system must sample at an entry point to the distribution system during periods of normal operating conditions (i.e., when water is representative of all sources being used).

d. The Director may reduce the total number of samples which must be analyzed by allowing the use of compositing. Compositing of samples must be done by certified laboratory personnel. Composite samples from a maximum of five samples are allowed, provided that if the lead concentration in the composite sample is greater than or equal to 0.001 mg/L or the copper concentration is greater than or equal to 0.160 mg/L, then either:

i. A follow-up sample shall be taken and analyzed within 14 days at each sampling point included in the composite; or

ii. If duplicates of or sufficient quantities from the original samples from each sampling point used in the composite are available, the water system may use these instead of resampling.

2. Where the results of sampling indicate an exceedance of maximum permissible source water levels established under § 709 (B)(4), the Director may require that one additional sample be collected as soon as possible after the initial sample was taken (but not to exceed two weeks) at the same sampling point. If a Director-required confirmation sample is taken for lead or copper, then the results of the initial and confirmation sample shall be averaged in determining compliance with the Director-specified maximum permissible levels. Any sample value below the detection limit shall be considered to be zero. Any value above the detection limit but below the PQL shall either be considered as the measured value or be considered as one-half the PQL.

B. Sampling frequency after CWS or NTNCWS exceeds tap water action level. Any CWS or NTNCWS which exceeds the lead or copper action level at the tap shall collect one source water sample from each entry point to the distribution system within six months after the exceedance.

C. Sampling frequency after installation of source water treatment. Any CWS or NTNCWS which installs source water treatment pursuant to § 709(A)(3) shall collect an additional source water sample from each entry point to the distribution system during two consecutive six-month sampling periods by the deadline specified in §709(A)(4).

D. Sampling frequency after the Director specifies maximum permissible source water levels or determines that source water treatment is not needed.

1. A CWS or NTNCWS shall sample at the frequency specified below in cases where the Director specifies maximum permissible source water levels under §709(B)(4) or determines that the public water system is not required to install source water treatment under § 709(B)(2).

a. A CWS or NTNCWS using only groundwater shall collect samples once during the three-year compliance period (as that term is defined in § 104) in effect when the applicable Director determination under subsection (D)(1) of this section is made. Such water system shall collect samples once during each subsequent compliance period.

b. A CWS or NTNCWS using surface water (or a combination of surface and groundwater) shall collect samples once during each year, the first annual sampling period to begin on the date on which the applicable Director determination is made under subsection (D)(1) of this section.

2. A CWS or NTNCWS is not required to conduct source water sampling for lead and/or copper if the water system meets the action level for the specific contaminant in tap water samples during the entire source water sampling period applicable to the water system under subsection (D)(1)(a) or (b) of this section.

E. Reduced sampling frequency.

1. A CWS or NTNCWS using only ground water may reduce the monitoring frequency for lead and copper in source water to once during each nine-year compliance cycle if the water system meets one of the following criteria:

a. The water system demonstrates that finished drinking water entering the distribution system has been maintained below the maximum permissible lead and copper concentrations specified by the Director in §709(B)(4) during at least three consecutive compliance periods under subsection (D)(1) of this section; or

b. The Director has determined that source water treatment is not needed and the water system demonstrates that, during at least three consecutive compliance periods in which sampling was conducted under subsection (D)(1) of this section, the concentration of lead in source water was less than or equal to 0.005 mg/L and the concentration of copper in source water was less than or equal to 0.65 mg/L.

2. A CWS or NTNCWS using surface water (or a combination of surface water and ground water) may reduce the monitoring frequency in subsection (D)(1) of this section to once during each nine-year compliance cycle if the water system meets one of the following criteria:

a. The CWS or NTNCWS demonstrates that finished drinking water entering the distribution system has been maintained below the maximum permissible lead and copper concentrations specified by the Director in §709(B)(4) for at least three consecutive years; or

b. The Director has determined that source water treatment is not needed and the CWS or NTNCWS demonstrates that, during at least three consecutive years, the concentration of lead in source water was less than or equal to 0.005 mg/L and the concentration of copper in source water was less than or equal to 0.65 mg/L.

3. A CWS or NTNCWS that uses a new source of water is not eligible for reduced sampling for lead and/or copper until concentrations in samples collected from the new source during three consecutive sampling periods are below the maximum permissible lead and copper concentrations specified by the Director in §709(A)(5).

§ 709 SOURCE WATER TREATMENT REQUIREMENTS

CWSs or NTNCWSs shall complete the applicable source water sampling and treatment requirements (described in the referenced portions of subsection (B) of this section, and in §§ 704 and 708) by the following deadlines:

A. Deadlines for Completing Source Water Treatment Steps:

1. Step 1: A CWS or NTNCWS exceeding the lead or copper action level shall complete lead or copper source water sampling (§708(B)) and make a treatment recommendation to the Director (§709(B)(1)) within 6 months after exceeding the lead or copper action level.

2. Step 2: The Director shall make a determination regarding source water treatment (§ 709 (B)(2)) within 6 months after submission of sampling results under Step 1.

3. Step 3: If the Director requires installation of source water treatment, the CWS or NTNCWS shall install the treatment (§709 (B)(3)) within 24 months after completion of Step 2.

4. Step 4: The CWS or NTNCWS shall complete follow-up tap water sampling (§704(D)(3)) and source water sampling (§708(C)) within 36 months after completion of Step 2.

5. Step 5: The Director shall review the CWS's or NTNCWS's installation and operation of source water treatment and specify maximum permissible source water levels (§709(B)(4)) within 6 months after completion of Step 4.

6. Step 6: The public water system shall operate in compliance with the maximum permissible lead and copper source water levels (§709 (B)(4)) and continue source water sampling (§ 708 (D)).

B. Description of Source Water Treatment Requirements:

1. CWS or NTNCWS treatment recommendation. Any CWS or NTNCWS which exceeds the lead or copper action level shall recommend in writing to the Director the installation and operation of one of the source water treatments listed in subsection (B)(2) of this section. A CWS or NTNCWS may recommend that no treatment be installed based upon a demonstration that source water treatment is not necessary to minimize lead and copper levels at users' taps.

2. Director determination regarding source water treatment. The Director shall complete an evaluation of the results of all source water samples submitted by the CWS or NTNCWS to determine whether source water treatment is necessary to minimize lead or copper levels in water delivered to users' taps. If the Director determines that treatment is needed, the Director shall either require installation and operation of the source water treatment recommended by the CWS or NTNCWS (if any) or require the installation and operation of another source water treatment from among the following: ion exchange, reverse osmosis, lime softening, or coagulation/filtration.

   If the Director requests additional information to aid in his/her review, the CWS or NTNCWS shall provide the information by the date specified by the Director in his/her request. The Director shall notify the system in writing of the determination and set forth the basis for his/her decision.

3. Installation of source water treatment. Each CWS or NTNCWS shall properly install and operate the source water treatment designated by the Director under subsection (B)(2) of this section.

4. Director review of source water treatment and specification of maximum permissible source water levels. The Director shall review the source water samples taken by the CWS or NTNCWS both before and after the system installs source water treatment, and determine whether the CWS or NTNCWS has properly installed and operated the source water treatment designated by the Director. Based upon this review, the Director shall designate the maximum permissible lead and copper concentrations for finished water entering the distribution system. Such levels shall reflect the contaminant removal capability of the treatment properly operated and maintained. The Director shall notify the CWS or NTNCWS in writing and explain the basis for the decision.

5. Continued operation and maintenance. Each CWS or NTNCWS shall maintain lead and copper levels below the maximum permissible concentrations designated by the Director at each sampling point sampled in accordance with § 708. The CWS or NTNCWS is out of compliance with this subsection if the level of lead or copper at any sampling point is greater than the maximum permissible concentration designated by the Director.

6. Modification of the Director treatment decisions. Upon the Director's own initiative or in response to a request by a CWS or NTNCWS or other interested party, the Director may modify the determination of the source water treatment under subsection (B)(2) of this section, or maximum permissible lead and copper concentrations for finished water entering the distribution system under subsection (B)(4) of this section. A request for modification by a CWS or NTNCWS or other interested party shall be in writing, explain why the modification is appropriate, and provide supporting documentation. The Director may modify a determination where the Director concludes that such change is necessary to ensure that the CWS or NTNCWS continues to minimize lead and copper concentrations in source water. A revised determination shall be made in writing, set forth the new treatment requirements, explain the basis for the Director's decision, and provide an implementation schedule for completing the treatment modifications.

7. Treatment decisions by EPA in lieu of the Director. Pursuant to the procedures in 40 CFR § 142.19, the EPA Regional Administrator may review treatment determinations made by the Director under subsections (B)(2), (B)(4), or (B)(6) of this section and issue Federal treatment determinations consistent with the requirements of those subsections where the Administrator finds that:

   a. The Director has failed to issue a treatment determination by the applicable deadlines contained in § 709(A);

   b. The Director has abused his/her discretion in a substantial number of cases or in cases affecting a substantial population; or

   c. The technical aspects of the Director's determination would be indefensible in an expected Federal enforcement action taken against a system.

§ 710 LEAD SERVICE LINE REPLACEMENT REQUIREMENTS

A. CWS or NTNCWSs that fail to meet the lead action level in tap samples taken pursuant to § 704 (D)(3), after installing corrosion control and/or source water treatment (whichever sampling occurs later), shall replace lead service lines in accordance with requirements of this section. If a CWS or NTNCWS is in violation of § 706 or § 709 for failure to install source water or corrosion control treatment, the Director may require the public water system to commence lead service line replacement under this section after the date by which the CWS or NTNCWS was required to conduct sampling under § 704 (D)(3) has passed.

B. A CWS or NTNCWS shall replace annually at least 7 % of the initial number of lead service lines in the distribution system. The initial number of lead service lines is the number of lead lines in place at the time the replacement program begins. The CWS or NTNCWS shall identify the initial number of lead service lines in its distribution system, including an identification of the portion(s) owned by the water system, based on a materials evaluation, including the evaluation required under § 704(A) and relevant legal authorities (e.g., contracts, local ordinances) regarding the portion owned by the water system. The first year of lead service line replacement shall begin on the date the action level was exceeded in tap sampling referenced in subsection (A) of this section.

C. A CWS or NTNCWS is not required to replace an individual lead service line if the lead concentration in all service line samples from that line, taken pursuant to § 704(B)(3), is less than or equal to 0.015 mg/L.

D. A CWS or NTNCWS shall replace that portion of the lead service line that it owns. In cases where the water system does not own the entire lead service line, the water system shall notify the owner of the line, or the owner's authorized agent, that the water system will replace the portion of the service line that it owns and shall offer to replace the owner's portion of the line. A water system is not required to bear the cost of replacing the privately-owned portion of the line, nor is it required to replace the privately-owned portion where the owner chooses not to pay the cost of replacing the privately-owned portion of the line, or where replacing the privately-owned portion would be precluded by tribal, local or common law. A water system that does not replace the entire length of the service line also shall complete the following tasks.

1. At least 45 days prior to commencing with the partial replacement of a lead service line, the water system shall provide notice to the resident(s) of all buildings served by the line explaining that they may experience a temporary increase of lead levels in their drinking water, along with guidance on measures consumers can take to minimize their exposure to lead. The Director may allow the water system to provide notice under the previous sentence less than 45 days prior to commencing partial lead service line replacement where such replacement is in conjunction with emergency repairs. In addition, the water system shall inform the resident(s) served by the line that the water system will, at the water system's expense, collect a sample from each partially-replaced lead service line that is representative of the water in the service line for analysis of lead content, as prescribed under § 704(B)(3), within 72 hours after the completion of the partial replacement of the service line. The water system shall collect the sample and report the results of the analysis to the owner and the resident(s) served by the line within three business days of receiving the results. Mailed notices post-marked within three business days of receiving the results shall be considered "on time."

2. The water system shall provide the information required by subsection (D)(1) of this section to the residents of individual dwellings by mail or by other methods approved by the Director. In instances where multi-family dwellings are served by the line, the water system shall have the option to post the information at a conspicuous location.

E. The Director shall require a CWS or NTNCWS to replace lead service lines on a shorter schedule than that required by this section, taking into account the number of lead service lines in the CWS or NTNCWS, where such a shorter replacement schedule is feasible. The Director shall make this determination in writing and notify the CWS or NTNCWS of the findings within 6 months after the CWS or NTNCWS is triggered into lead service line replacement based on sampling referenced in subsection (A) of this section.

F. Any CWS or NTNCWS may cease replacing lead service lines whenever first draw samples collected pursuant to § 704(B)(2) meet the lead action level during each of two consecutive sampling periods and the CWS or NTNCWS submits the results to the Director. If the first draw tap samples collected in any such public water system thereafter exceeds the lead action level, the public water system shall recommence replacing lead service lines, pursuant to subsection (B) in this section.

G. To demonstrate compliance with subsections (A) through (D) of this section, a CWS or NTNCWS shall report to the Director the information specified in § 712(E).

§ 711 PUBLIC EDUCATION AND SUPPLEMENTAL SAMPLING REQUIREMENTS

A. A CWS or NTNCWS that exceeds the lead action level based on tap water samples collected in accordance with § 704 shall deliver the public education materials contained in subsections (A) and (B) of this section in accordance with the requirements in subsection (C) of this section.

1. Community Water Systems: Content of written public education materials.
A CWS shall include the following text in all of the printed materials it distributes through its lead public education program. Water systems may delete information pertaining to lead service lines, upon approval by the Director, if no lead service lines exist anywhere in the water system service area. Public education language at subsections (A)(1)(d)(ii)(5) and (A)(1)(d)(iv)(2) of this section may be modified regarding building permit record availability and consumer access to these records, if approved by the Director. Water systems may also continue to utilize pre-printed materials that meet the public education language requirements in § 711. Any additional information presented by a system shall be consistent with the information below and be in plain English, or plain English and plain Navajo that can be understood by lay people.

a. Introduction. EPA and [please insert name of water supplier] are concerned about lead in your drinking water. Although most homes have very low levels of lead in their drinking water, some homes in the community have lead levels above the EPA action level of 15 parts per billion (ppb), or 0.015 milligrams of lead per liter of water (mg/L). Under Federal law, we are required to have a program in place to minimize lead in your drinking water by [insert date when corrosion control will be completed for your public water system]. This program includes corrosion control treatment, source water treatment, and public education. We are also required to replace the portion of each lead service line that we own if the line contributes lead concentrations of more than 15 ppb after we have completed the comprehensive treatment program. If you have any questions about how we are carrying out the requirements of the lead regulation please give us a call at [insert public water

system's phone number]. This brochure explains the simple steps you can take to protect you and your family by reducing your exposure to lead in drinking water.

b. Health effects of lead. Lead is a common metal found throughout the environment in lead-based paint, air, soil, household dust, food, certain types of pottery, porcelain and pewter, and water. Lead can pose a significant risk to your health if too much of it enters your body. Lead builds up in the body over many years and can cause damage to the brain, red blood cells and kidneys. The greatest risk is to young children and pregnant women. Amounts of lead that won't hurt adults can slow down normal mental and physical development of growing bodies. In addition, a child at play often comes into contact with sources of lead contamination--like dirt and dust--that rarely affect an adult. It is important to wash children's hands and toys often, and to try to make sure they only put food in their mouths.

c. Lead in Drinking Water.

i. Lead in drinking water, although rarely the sole cause of lead poisoning, can significantly increase a person's total lead exposure, particularly the exposure of infants who drink baby formulas and concentrated juices that are mixed with water. The EPA estimates that drinking water can make up 20 % or more of a person's total exposure to lead.

ii. Lead is unusual among drinking water contaminants in that it seldom occurs naturally in water supplies like rivers and lakes. Lead enters drinking water primarily as a result of the corrosion, or wearing away, of materials containing lead in the water distribution system and household plumbing. These materials include lead-based solder used to join copper pipe, brass and chrome plated brass faucets, and in some cases, pipes made of lead that connect your house to the water main (service lines). In 1986, Congress banned the use of lead solder containing greater than 0.2% lead, and restricted the lead content of faucets, pipes and other plumbing materials to 8.0%.

iii. When water stands in lead pipes or plumbing systems containing lead for several hours or more, the lead may dissolve into your drinking water. This means the first water drawn from the tap in the morning, or later in the afternoon after returning from work or school, can contain fairly high levels of lead.

d. Steps You Can Take in the Home to Reduce Exposure to Lead in Drinking Water.

i. Despite our best efforts mentioned earlier to control water corrosivity and to remove lead from the public water systems, lead levels in some homes or buildings can be high. To find out whether you need to take action in your own home, have your drinking water tested to determine if it contains excessive concentrations of lead. Testing the water is essential because you cannot see, taste, or smell lead in drinking water. Some local laboratories that can provide this service are listed at the end of this booklet. For more information on having your water tested, please call [insert phone number of public water system].

ii. If a water test indicates that the drinking water drawn from a tap in your home contains lead above 15 ppb, then you should take the following precautions:

1. Let the water run from the tap before using it for drinking or cooking any time the water in a faucet has gone unused for more than six hours. The longer water resides in your home's plumbing the more lead it may contain. Flushing the tap means running the cold water faucet until the water gets noticeably colder, usually about 15-30 seconds. If your house has a lead service line to the water main, you may have to flush the water for a longer time, perhaps one minute, before drinking. Although toilet flushing or showering flushes water through a portion of your home's plumbing system, you still need to flush the water in each faucet before using it for drinking or cooking. Flushing tap water is a simple and inexpensive measure you can take to protect your family's health. It usually uses less than one or two gallons of water and costs less than [insert a cost estimate based on flushing two times a day for 30 days] per month. To conserve water, fill a couple of bottles for drinking water after flushing the tap, and whenever possible use the first flush water to wash the dishes or water the

plants. If you live in a high-rise building, letting the water flow before using it may not work to lessen your risk from lead. The plumbing systems have more and sometimes larger pipes than smaller buildings. Ask your landlord for help in locating the source of the lead and for advice on reducing the lead level.

2. Try not to cook with or drink water from the hot water tap. Hot water can dissolve more lead more quickly than cold water. If you need hot water, draw water from the cold tap and heat it on the stove.

3. Remove the loose lead solder and debris from plumbing materials installed in newly constructed homes, or homes in which the plumbing has recently been replaced, by removing the faucet strainers from all taps and running the water from 3 to 5 minutes. Thereafter, periodically remove the strainers and flush out any debris that has accumulated over time.

4. If your copper pipes are joined with lead solder that has been installed illegally since it was banned in 1986, notify the plumber who did the work and request that he or she replace the lead solder with lead-free solder. Lead solder looks dull gray, and when scratched with a key looks shiny. In addition, notify the NNEPA's PWSSP about the violation.

5. Determine whether or not the service line that connects your home or apartment to the water main is made of lead. The best way to determine if your service line is made of lead is by either hiring a licensed plumber to inspect the line or by contacting the plumbing contractor who installed the line. You can identify the plumbing contractor by checking the city's record of building permits which should be maintained in the files of the [the name of the department that issues building permits]. A licensed plumber can at the same time check to see if your home's plumbing contains lead solder, lead pipes, or pipe fittings that contain lead. The public water system that delivers water to your home should also maintain records of the materials located in the distribution system. If the service line that connects your dwelling to the water main contributes more than 15 ppb to drinking water, after our comprehensive treatment program is in place, we are required to replace the line. If the line is only partially controlled by the [insert name of the public water system that controls the line], we are required to provide the owner of the privately-owned portion of the line with information on how to replace the privately-owned portion of the service line, and offer to replace that portion of the line at the owner's expense. If we replace only the portion of the line that we own, we also are required to notify you in advance and provide you with information on the steps you can take to minimize exposure to any temporary increase in lead levels that may result from the partial replacement, to take a follow-up sample at our expense from the line within 72 hours after the partial replacement, and to mail or otherwise provide you with the results of that sample within three business days of receiving the results. Acceptable replacement alternatives include copper, steel, iron, and plastic pipes.

6. Have an electrician check your wiring. If grounding wires from the electrical system are attached to your pipes, corrosion may be greater. Check with a licensed electrician or your local electrical code to determine if your wiring can be grounded elsewhere. DO NOT attempt to change the wiring yourself because improper grounding can cause electrical shock and fire hazards.

iii. The steps described above will reduce the lead concentrations in your drinking water. However, if a water test indicates that the drinking water coming from your tap contains lead concentrations in excess of 15 ppb after flushing, or after we have completed our actions to minimize lead levels, then you may want to take the following additional measures:

1. Purchase or lease a home treatment device. Home treatment devices are limited in that each unit treats only the water that flows from the faucet to which it is connected, and all of the devices require periodic

maintenance and replacement. Devices such as reverse osmosis or distillers can effectively remove lead from your drinking water. Some activated carbon filters may reduce lead levels at the tap, however all lead reduction claims should be investigated. Be sure to check the actual performance of a specific home treatment device before and after installing the unit.

2. Purchase bottled water for drinking and cooking.

iv. You can consult a variety of sources for additional information. Your family doctor or pediatrician can perform a blood test for lead and provide you with information about the health effects of lead. Government agencies that can be contacted include:

1. The NNEPA-PWSSP at (928) 871-7755 or contact Navajo Tribal Utility Authority at (928) 729-5721 can provide you with information about your community's public water system, and a list of local laboratories that have been certified by EPA for testing water quality;

2. The Director of Indian Health Service (928) 729-8400 or 729-8000 can provide you with information about the health effects of lead and how you can have your child's blood tested.

v. The following is an approved laboratory in your area that you can call to have your water tested for lead--NTUA Laboratory at (928) 729-5721.

2. Non-transient non-community water systems.

A NTNCWS shall either include the text specified in subsection (A)(1) of this section or shall include the following text in all of the printed materials it distributes through its lead public education program. Water systems may delete information pertaining to lead service lines upon approval by the Director if no lead service lines exist anywhere in the water system service area. Any additional information presented by a water system shall be consistent with the information below and be in plain English, or plain English and plain Navajo that can be understood by lay people.

a. Introduction. EPA and [insert name of water supplier] are concerned about lead in your drinking water. Some drinking water samples taken from this facility have lead levels above the EPA action level of 15 parts per billion (ppb), or 0.015 milligrams of lead per liter of water (mg/L). Under Federal law we are required to have a program in place to minimize lead in your drinking water by [insert date when corrosion control will be completed for your water system]. This program includes corrosion control treatment, source water treatment, and public education. We are also required to replace the portion of each lead service line that we own if the line contributes lead concentrations of more than 15 ppb after we have completed the comprehensive treatment program. If you have any questions about how we are carrying out the requirements of the lead regulation please give us a call at [insert water system's phone number]. This brochure explains the simple steps you can take to protect yourself by reducing your exposure to lead in drinking water.

b. Health effects of lead. Lead is found throughout the environment in lead-based paint, air, soil, household dust, food, certain types of pottery porcelain and pewter, and water. Lead can pose a significant risk to your health if too much of it enters your body. Lead builds up in the body over many years and can cause damage to the brain, red blood cells and kidneys. The greatest risk is to young children and pregnant women. Amounts of lead that won't hurt adults can slow down normal mental and physical development of growing bodies. In addition, a child at play often comes into contact with sources of lead contamination - like dirt and dust - that rarely affect an adult. It is important to wash children's hands and toys often, and to try to make sure they only put food in their mouths.

c. Lead in drinking water.

i. Lead in drinking water, although rarely the sole cause of lead poisoning, can significantly increase a person's total lead exposure, particularly the exposure of infants who drink baby formulas and concentrated juices that are mixed with water. EPA estimates that drinking water can make up 20 percent or more of a person's total exposure to lead.

ii. Lead is unusual among drinking water contaminants in that it seldom occurs naturally in water supplies like rivers and lakes. Lead enters drinking water primarily as a result of the corrosion, or wearing away, of materials containing lead in the water distribution system and household plumbing. These materials include lead-based solder used to join copper pipe, brass and chrome-plated brass faucets, and in some cases, pipes made of lead that connect houses and buildings to water mains (service lines). In 1986, Congress banned the use of lead solder containing greater than 0.2% lead, and restricted the lead content of faucets, pipes and other plumbing materials to 8.0%.

iii. When water stands in lead pipes or plumbing water systems containing lead for several hours or more, the lead may dissolve into your drinking water. This means the first water drawn from the tap in the morning, or later in the afternoon if the water has not been used all day, can contain fairly high levels of lead.

d. Steps you can take to reduce exposure to lead in drinking water.

i. Let the water run from the tap before using it for drinking or cooking any time the water in a faucet has gone unused for more than six hours. The longer water resides in plumbing the more lead it may contain. Flushing the tap means running the cold water faucet for about 15-30 seconds. Although toilet flushing or showering flushes water through a portion of the plumbing water system, you still need to flush the water in each faucet before using it for drinking or cooking. Flushing tap water is a simple and inexpensive measure you can take to protect your health. It usually uses less than one gallon of water.

ii. Do not cook with, or drink water from the hot water tap. Hot water can dissolve lead more quickly than cold water. If you need hot water, draw water from the cold tap and then heat it.

iii. The steps described above will reduce the lead concentrations in your drinking water. However, if you are still concerned, you may wish to use bottled water for drinking and cooking.

iv. You can consult a variety of sources for additional information. Your family doctor or pediatrician can perform a blood test for lead and provide you with information about the health effects of lead. NNEPA and local government agencies that can be contacted include:

1. [insert the name or title of facility official if appropriate] at [insert phone number] can provide you with information about your facility's water supply; and

2. The Director of Indian Health Service (928) 729-8400 or 729-8000 can provide you with information about the health effects of lead.

B. Content of broadcast materials. A public water system shall include the following information in all public service announcements submitted under its lead public education program to television and radio stations for broadcasting:

1. Why should everyone want to know the facts about lead and drinking water? Because unhealthy amounts of lead can enter drinking water through the plumbing in your home. That's why I urge you to do what I did. I had my water tested for [insert "free" or $ per sample]. You can contact the [insert the name of the public water system for information on testing and on simple ways to reduce your exposure to lead in drinking water.

2. To have your water tested for lead, or to get more information about this public water concern, please call [the phone number of the public water system.

C. Delivery of a public education program.

1. In communities where a significant proportion of the population speaks Navajo, public education materials shall be communicated in Navajo, as well as English, whenever possible.

2. A CWS that exceeds the lead action level on the basis of tap water samples collected in accordance with § 704, and that is not already repeating public education tasks pursuant to subsection (C)(3), (C)(7), or (C)(8), of this section, shall, within 60 days:

   a. Insert notices in each customer's water utility bill containing the information in subsection (A)(1) of this section, along with the following alert on the water bill itself in large print:

      "SOME HOMES IN THIS COMMUNITY HAVE ELEVATED LEAD LEVELS IN THEIR DRINKING WATER. LEAD CAN POSE A SIGNIFICANT RISK TO YOUR HEALTH. PLEASE READ THE ENCLOSED NOTICE FOR FURTHER INFORMATION." A CWS having a billing cycle that does not include a billing within 60 days of exceeding the action level, or that cannot insert information in the water utility bill without making major changes to its billing water system, may use a separate mailing to deliver the information in subsection (A)(1) of this section as long as the information is delivered to each customer within 60 days of exceeding the action level. Such water systems shall also include the "alert" language specified in this subsection.

   b. Submit the information in subsection (A)(1) of this section to the editorial departments of the major daily and weekly newspapers circulated throughout the community.

   c. Deliver pamphlets and/or brochures that contain the public education materials in subsections (A)(1) (b) and(A)(1) (d) of this section to facilities and organizations, including the following:

      i. Public schools and/or local school boards;
      ii. Federal or tribal health department;
      iii. Women, Infants, and Children and/or Head Start Program(s) whenever available;
      iv. Public and private hospitals and/or clinics;
      v. Pediatricians;
      vi. Family planning clinics; and
      vii. Local welfare agencies.

   d. Submit the public service announcement to at least five of the radio and television stations with the largest audiences that broadcast to the community served by the public water system.

3. A CWS shall repeat the tasks contained in subsections (C)(2) (a),(b) and (c) of this section every 12 months, and the tasks contained in subsections (C)(2) (d) of this section every 6 months for as long as the water system exceeds the lead action level.

4. Within 60 days after it exceeds the lead action level,(unless it already is repeating public education tasks pursuant to subsection (C)(5) of this section), a NTNCWS shall deliver the public education materials contained in subsections (A)(1), or the public education materials specified by subsection (A)(2) of this section as follows:

   a. Post informational posters on lead in drinking water in a public place or common area in each of the buildings served by the water system; and

   b. Distribute informational pamphlets and/or brochures on lead in drinking water to each person served by the NTNCWS. The Director may allow the water system to utilize electronic transmission in lieu of or combined with printed materials as long as it achieves at least the same coverage.

5. A NTNCWS shall repeat the tasks contained in subsection (C)(4) of this section at least once during each calendar year in which the public water system exceeds the lead action level.

6. A public water system may discontinue delivery of public education materials if the water system has met the lead action level during the most recent six-month sampling period conducted pursuant to § 704. Such a water system shall recommence public education in accordance with this section if it subsequently exceeds the lead action level during any sampling period.

7. A CWS may apply to the Director, in writing, (unless the Director has waived the requirement for prior Director approval) to use the text specified in subsection (A)(2) of this section in lieu of the text in subsection (A)(1) of this section and to perform the tasks listed

in subsections (C)(4) and (C)(5) of this section in lieu of the tasks in subsections (C)(2) and (C)(3) of this section if:

a. The water system is a facility, such as a prison or a hospital, where the population served is not capable of or is prevented from making improvements to plumbing or installing point of use treatment devices; and

b. The water system provides water as part of the cost of services provided and does not separately charge for water consumption.

8. a. A CWS serving 3,300 or fewer people may omit the task contained in subsection (C)(2)(d) of this section. As long as it distributes notices containing the information contained in subsection (A)(1) of this section to every household served by the public water system, such water systems may further limit their public education programs as follows:

i. Water systems serving 500 or fewer people may forego the task contained in subsection (C)(2)(b) of this section. Such a water system may limit the distribution of the public education materials required under subsection (C)(2)(c) of this section to facilities and organizations served by the water system that are most likely to be visited regularly by pregnant women and children, unless it is notified by the Director in writing that it must make a broader distribution.

ii. If approved by the Director in writing, a water system serving 501 to 3,300 people may omit the task in subsection (C)(2) (b) of this section and/or limit the distribution of the public education materials required under subsection (C)(2)(c) of this section to facilities and organizations served by the water system that are most likely to be visited regularly by pregnant women and children.

b. A CWS serving 3,300 or fewer people that delivers public education in accordance with subsection (C)(8)(a) of this section shall repeat the required public education tasks at least once during each calendar year in which the water system exceeds the lead action level.

D. Supplemental sampling and notification of results. A public water system that fails to meet the lead action level on the basis of tap samples collected in accordance with § 704 shall offer to sample the tap water of any customer who requests it. The public water system is not required to pay for collecting or analyzing the sample, nor is the public water system required to collect and analyze the sample itself.

§ 712 REPORTING REQUIREMENTS

All CWS or NTNCWS s shall report all of the following information to the Director in accordance with this section.

A. Reporting requirements for tap water sampling for lead and copper and for water quality parameter sampling.

1. Except as provided in subsection (A)(1) (h) of this section, a water system shall report the information specified below for all tap water samples specified in § 704 and for all water quality parameter samples specified in § 707 within the first 10 days following the end of each applicable monitoring period specified in §§ 704 and 707 (i.e., every six months, annually, every 3 years, or every 9 years):

a. The results of all tap samples for lead and copper including the location of each site and the criteria under § 704(A)(3), (4), (5), (6), and/or (7) under which the site was selected for the public water system's sampling pool;

b. Documentation for each tap water lead or copper sample for which the water system requests invalidation pursuant to § 704(F)(2);

c. [Reserved];

d. The 90th percentile lead and copper concentrations measured from among all lead and copper tap water samples collected during each sampling period (calculated in accordance with § 703(A)(3), unless the Director calculates the water system's 90th percentile lead and copper levels under subsection (H) of this section);

e. With the exception of initial tap sampling conducted pursuant to § 704 (D)(2), the public water system shall designate any site which was not sampled during previous sampling periods, and include an explanation of why sampling sites have changed;

f. The results of all tap samples for pH, and where applicable, alkalinity, calcium, conductivity, temperature, and orthophosphate or silica collected under § 707(B) - (E);

g. The results of all samples collected at the entry point(s) to the distribution system for applicable water quality parameters under § 707(B) - (E);

h. A water system shall report the results of all water quality parameter samples collected under § 707(C)-(F) during each six-month monitoring period specified in § 707(D) within the first 10 days following the end of the monitoring period unless the Director has specified a more frequent reporting requirement.

2. For a NTNCWS, or a CWS meeting the criteria of § 711(C)(7)(a) and (b), that does not have enough taps that can provide first-draw samples, the water system must either:

a. Provide written documentation to the Director identifying standing times and locations for enough non-first-draw samples to make up its sampling pool under § 704(B)(5) by the start of the first applicable monitoring period under § 704(D) that commences after promulgation of these regulations, unless the Director has waived prior Director- approval of non-first-draw sample sites selected by the water system pursuant to § 704(B)(5); or

b. If the Director has waived prior approval of non-first-draw sample sites selected by the water system, identify, in writing, each site that did not meet the six-hour minimum standing time and the length of standing time for that particular substitute sample collected pursuant to § 704(B)(5) and include this information with the lead and copper tap sample results required to be submitted pursuant to subsection (A)(1)(i) of this section.

3. No later than 60 days after the addition of a new source or any change in water treatment, unless the Director requires earlier notification, a water system deemed to have optimized corrosion control under § 706(B)(3), a water system subject to reduced monitoring pursuant to § 704 (D)(5), or a water system subject to a monitoring waiver pursuant to § 704(G), shall send written documentation to the Director describing the change. In those instances where prior Director-approval of the treatment change or new source is not required, water systems are encouraged to provide the notification to the Director beforehand to minimize the risk the treatment change or new source will adversely affect optimal corrosion control.

4. Any small water system applying for a monitoring waiver under § 704(G), or subject to a waiver granted pursuant to § 704(G)(3), shall provide the following information to the Director in writing by the specified deadline:

a. By the start of the first applicable monitoring period in § 704(D), any small water system applying for a monitoring waiver shall provide the documentation required to demonstrate that it meets the waiver criteria of §§ 704(G)(1) and (2).

b. No later than nine years after the monitoring previously conducted pursuant to §704(G)(2) or §704(G)(4)(a), each small water system desiring to maintain its monitoring waiver shall provide the information required by §704(G)(4)(a) and (b).

c. No later than 60 days after it becomes aware that it is no longer free of lead-containing and/or copper-containing material, as appropriate, each small water system with a monitoring waiver shall provide written notification to the Director, setting forth the circumstances resulting in the lead-containing and/or copper-containing materials being introduced into the water system and what corrective action, if any, the water system plans to remove these materials.

d. By October 10, 2000, any small water system with a waiver granted prior to the promulgation of these regulations and that has not previously met the requirements of § 704(G)(2) shall provide the information required by that subsection.

5. Each ground water system that limits water quality parameter monitoring to a subset of entry points under § 707(C)(3) shall provide, by the commencement of such monitoring, written

correspondence to the Director that identifies the selected entry points and includes information sufficient to demonstrate that the sites are representative of water quality and treatment conditions throughout the water system.

B. Source water sampling reporting requirements.

1. A public water system shall report the sampling results for all source water samples collected in accordance with § 708 within the first 10 days following the end of each source water sampling period (i.e., annually, per compliance period, per compliance cycle) specified in § 708.

2. With the exception of the first round of source water sampling conducted pursuant to § 708(B), the water system shall specify any site which was not sampled during previous sampling periods, and include an explanation of why the sampling point has changed.

C. Corrosion control treatment reporting requirements. By the applicable dates under § 706, public water systems shall report the following information:

1. For public water systems demonstrating that they have already optimized corrosion control, information required in § 706(B)(2) or (3).

2. For public water systems required to optimize corrosion control, their recommendation regarding optimal corrosion control treatment under § 705(A).

3. For public water systems required to evaluate the effectiveness of corrosion control treatments under § 705(C), the information required by that subsection.

4. For public water systems required to install optimal corrosion control designated by the Director under § 705(D), a letter certifying that the public water system has completed installing that treatment.

D. Source water treatment reporting requirements. By the applicable dates in § 709, public water systems shall provide the following information to the Director:

1. If required under § 709(B)(1), their recommendation regarding source water treatment;

2. For public water systems required to install source water treatment under § 709(B)(2), a letter certifying that the public water system has completed installing the treatment designated by the Director within 24 months after the Director designated the treatment.

E. Lead service line replacement reporting requirements. Public water systems shall report the following information to the Director to demonstrate compliance with the requirements of § 710:

1. Within 12 months after a public water system exceeds the lead action level in sampling referred to in § 710(A), the public water system shall demonstrate in writing to the Director that it has conducted a material evaluation, including the evaluation in § 704(A), to identify the initial number of lead service lines in its distribution system, and shall provide the Director with the public water system's schedule for replacing annually at least 7 % of the initial number of lead service lines in its distribution system.

2. Within 12 months after a public water system exceeds the lead action level in sampling referred to in § 710(A), and every 12 months thereafter, the public water system shall demonstrate to the Director in writing that the public water system has either:

a. Replaced in the previous 12 months at least 7 % of the initial lead service lines (or a greater number of lines specified by the Director under §710 (E)) in its distribution system, or;

b. Conducted sampling which demonstrates that the lead concentration in all service lines samples from an individual line(s), taken pursuant to § 704(B)(3), is less than or equal to 0.015 mg/L. In such cases, the total number of lines replaced and/or which meet the criteria in § 710(C) shall equal at least 7 % of the initial number of lead lines identified under subsection (A) of this section (or the percentage specified by the Director under § 710(E)).

3. The annual letter submitted to the Director under subsection (E)(2) of this section shall contain the following information:

a. The number of lead service lines scheduled to be replaced during the previous year of the public water system's replacement schedule;

b. The number and location of each lead service line replaced during the previous year of the public water system's replacement schedule;

c. If measured, the water lead concentration and location of each lead service line sampled, the sampling method, and the date of sampling.

4. Any water system which collects lead service line samples following partial lead service line replacement required by §710 shall report the results to the Director within the first ten days of the month following the month in which the water system receives the laboratory results, or as specified by the Director. The Director may eliminate this requirement to report these monitoring results. Water systems shall also report any additional information as specified by the Director, and in a time and manner prescribed by the Director, to verify that all partial lead service line replacement activities have taken place.

F. Public education program reporting requirements.

1. Any water system that is subject to the public education requirements in § 711 shall, within ten days after the end of each period in which the water system is required to perform public education tasks in accordance with §711(C), send written documentation to the Director that contains:

a. A demonstration that the water system has delivered the public education materials that meet the content requirements in § 711(A) and (B) and the delivery requirements in § 711(C); and

b. A list of all the newspapers, radio stations, television stations, and facilities and organizations to which the water system delivered public education materials during the period in which the water system was required to perform public education tasks.

2. Unless required by the Director, a water system that previously has submitted the information required by subsection (F)(1) (b) of this section need not resubmit the information required by subsection (F)(1) (b) of this section, as long as there have been no changes in the distribution list and the water system certifies that the public education materials were distributed to the same list submitted previously.

G. Reporting of additional sampling data. Any CWS or NTNCWS which collects sampling data in addition to that required by this part shall report the results to the Director within the first ten days following the end of the applicable sampling period under §§ 704, 707, and 708 during which the samples are collected.

H. Reporting of 90th percentile lead and copper concentrations where the Director calculates a water system's 90th percentile concentrations. A water system is not required to report the 90th percentile lead and copper concentrations measured from among all lead and copper tap water samples collected during each monitoring period, as required by subsection (A)(1) (d) of this section if:

1. The Director has previously notified the water system that it will calculate the water system's 90th percentile lead and copper concentrations, based on the lead and copper tap results submitted pursuant to subsection (H)(2) (a) of this section, and has specified a date before the end of the applicable monitoring period by which the water system must provide the results of lead and copper tap water samples;

2. The water system has provided the following information to the Director by the date specified in subsection (H)(1) of this section:

a. The results of all tap samples for lead and copper including the location of each site and the criteria under § 704(A)(3), (4), (5), (6), and/or (7) under which the site was selected for the water system's sampling pool, pursuant to subsection (A)(1)(a) of this section; and

b. An identification of sampling sites utilized during the current monitoring period that were not sampled during previous monitoring periods, and an explanation why sampling sites have changed; and

beginning immediately, if the Administrator has already made that determination, unless the Director

3. The Director has provided the results of the 90th percentile lead and copper calculations, in writing, to the water system before the end of the monitoring period.

§ 713 RECORDKEEPING REQUIREMENTS

Any CWS or NTNCWS subject to the requirements of this part, Part VII-Lead and Copper, shall retain on its premises original records of all sampling data and analyses, reports, surveys, letter, evaluations, schedules, Director-determinations, and any other information required by § 706 through § 708. Each public water system shall retain the records required by this section for no fewer than 12 years.

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immediately prior to the first or only point of disinfectant application in at least 90 % of the measurements made for the 6 previous months that the public water system served water to the public on an ongoing basis. If a public water system measures both fecal and total coliforms, the fecal coliform criterion, but not the total coliform criterion, in this subsection must be met.

2. The turbidity level cannot exceed 5 NTU (measured as specified in Appendix D § 801-D (A)(1) and (B)(2)) in representative samples of the source water immediately prior to the first or only point of disinfectant application unless:

   a. The Director determines that any such event was caused by circumstances that were unusual and unpredictable; and

   b. As a result of any such event, there have not been more than two events in the past 12 months that the public water system served water to the public, or more than five events in the past 120 months the public water system served water to the public, in which the turbidity level exceeded 5 NTU. An "event" is a series of consecutive days during which at least one turbidity measurement each day exceeds 5 NTU.

B. Site-Specific Conditions.

1. a. The public water system must meet the requirements of § 804 (A)(1) at least 11 of the 12 previous months that the public water system served water to the public, on an ongoing basis, unless the public water system fails to meet the requirements during 2 of the 12 previous months that the public water system served water to the public, and the Director determines that at least one of these failures was caused by circumstances that were unusual and unpredictable.

   b. The public water system must meet the requirements of § 804 (A)(2) at all times that the system serves water to the public.

   c. The public water system must meet the requirements of § 804 (A)(3) at all times that the system serves water to the public unless the Director determines that any such failure was caused by circumstances that were unusual and unpredictable.

   d. The public water system must meet the requirements of § 804 (A)(4) on an ongoing basis unless the Director determines that failure to meet these requirements was not caused by a deficiency in treatment of the source water.

2. The public water system must maintain a watershed control program which minimizes the potential for contamination by *Giardia lamblia* cysts and viruses in the source water. The Director must determine whether the watershed control program is adequate to meet this goal. The adequacy of a program to limit potential contamination by *Giardia lamblia* cysts and viruses must be based on: the comprehensiveness of the watershed review; the effectiveness of the public water system's program to monitor and control detrimental activities occurring in the watershed; and the extent to which the public water system has maximized land ownership and/or controlled land use within the watershed. At a minimum, the watershed control program must:

   a. Characterize the watershed hydrology and land ownership;

   b. Identify watershed characteristics and activities which may have an adverse effect on source water quality; and

   c. Monitor the occurrence of activities which may have an adverse effect on source water quality.

The public water system must demonstrate through ownership and/or written agreements with

watershed control program and disinfection treatment process. Either the Director or a party approved by the Director must conduct the on-site inspection. The inspection must be conducted by competent individuals such as sanitary and civil engineers, sanitarians, or technicians who have experience and knowledge about the operation and maintenance of a public water system, and who have a sound understanding of public health principles and waterborne diseases. A report of the on-site inspection summarizing all findings must be prepared every year and forwarded to the Director. The on-site inspection must indicate to the Director's satisfaction that the watershed control program and disinfection treatment process are adequately designed and maintained. The on-site inspection must include:

a. A review of the effectiveness of the watershed control program;

b. A review of the physical condition of the source intake and how well it is protected;

c. A review of the system's equipment maintenance program to ensure there is low probability for failure of the disinfection process;

d. An inspection of the disinfection equipment for physical deterioration;

e. A review of operating procedures;

f. A review of data records to ensure that all required tests are being conducted and recorded and disinfection is effectively practiced; and

g. Identification of any improvements which are needed in the equipment, system maintenance and operation, or data collection.

4. The public water system must not have been identified as a source of a waterborne disease outbreak, or if it has been so identified, the system must have been modified sufficiently to prevent another such occurrence, as determined by the Director.

5. The public water system must comply with the MCL for total coliforms in § 205 at least 11 months of the 12 previous months that the system served water to the public, on an ongoing basis, unless the Director determines that failure to meet this requirement was not caused by a deficiency in treatment of the source water.

6. The water system must comply with the requirements for total trihalomethanes, haloacetic acids (five), bromate, chlorite, chlorine, chloramines, and chlorine dioxide in Part XI of these regulations.

C. Treatment Technique Violations.

1. A public water system is in violation of a treatment technique requirement if the system:

a. fails to meet any one of the criteria in subsections (A) and (B) of this section and/or which the Director has determined that filtration is required, in writing, pursuant to § 2535 of the NNSDWA, and

b. fails to install filtration as required in the introductory paragraph of this section.

2. A public water system that has not installed filtration is in violation of a treatment technique requirement if:

a. The turbidity level (measured as specified in § Appendix D § 801-D (A)(1) and (B)(2)) in a representative sample of the source water immediately prior to the first or only point of disinfection application exceeds 5 NTU; or

b. The system is identified as a source of a waterborne disease outbreak.

§ 804 DISINFECTION

A public water system that uses a surface water source and does not provide filtration treatment must provide the disinfection treatment specified in subsection (A) of this section unless the Director determines, in writing, that filtration is required pursuant to § 2535 of the NNSDWA. A public water system that uses a groundwater source under the direct influence of surface water and does not provide filtration treatment must provide disinfection treatment specified in subsection (A) of this section 18 months after the Director determines that the groundwater source is under the influence of surface

water, or beginning immediately, if the administrator has already made that determination, unless the Director has determined in writing that filtration is required pursuant to §2535 of the NNSDWA. If the Director has determined that filtration is required, the public water system must comply with any interim disinfection requirements the Director deems necessary before filtration is installed. A public water system that uses a surface water source that provides filtration treatment must provide the disinfection treatment specified in subsection (B) of this section beginning when filtration is installed. A public water system that uses a groundwater source under the direct influence of surface water and provides filtration treatment must provide disinfection treatment as specified in subsection (B) of this section beginning when filtration is installed. Failure to meet any requirement specified in this introductory subsection is a treatment technique violation.

A. Disinfection requirements for public water systems that do not provide filtration. Each public water system that does not provide filtration treatment must provide disinfection treatment as follows:

1. The disinfection treatment must be sufficient to ensure at least 99.9 % (3-log) inactivation of *Giardia lamblia* cysts and 99.99 % (4-log) inactivation of viruses, every day that the system serves water to the public, except any one day each month. Each day a system serves water to the public, the public water system must calculate the CT value(s) from the system's treatment parameters, using the procedure specified in Appendix D § (801-D) (B)(3), and determine whether this value(s) is sufficient to achieve the specified inactivation rates for *Giardia lamblia* cysts and viruses. If a system uses a disinfectant other than chlorine, the system may demonstrate to the Director, through the use of a Director-approved protocol for on-site disinfection challenge studies or other information satisfactory to the Director, that $CT_{99.9}$ values other than those specified in Appendix D: Tables 800-D-10 and 800-D-11 or other operational parameters are adequate to demonstrate that the system is achieving minimum inactivation rates required by subsection (A)(1) of this section.

2. The disinfection system must have either:

   a. redundant components, including an auxiliary power supply with automatic start-up and alarm to ensure that disinfectant application is maintained continuously while water is being delivered to the distribution system, or

   b. automatic shut-off of water delivery to the distribution system whenever there is less than 0.2 mg/L of residual disinfectant concentration in the water. If the Director determines that automatic shut-off would cause unreasonable risk to health or interfere with fire protection, the public water system must comply with subsection (A)(2)(a) of this section.

3. The residual disinfectant concentration in the water entering the distribution system, measured as specified in Appendix D § 801-D (A)(2) and (B)(5), cannot be less than 0.2 mg/l for more than 4 hours.

4. a. The residual disinfectant concentration in the distribution system, measured as total chlorine, combined chlorine, or chlorine dioxide, as specified in Appendix D § 801-D (A)(2) and (B)(6), cannot be undetectable in more than 5 % of the samples each month, for any two consecutive months that the system serves water to the public. Water in the distribution system with a heterotrophic bacteria concentration less than or equal to 500/ml, measured as heterotrophic plate count (HPC) as specified in Appendix D § 801-D (A)(1), is deemed to have a detectable disinfectant residual for purposes of determining compliance with this requirement. Thus, the values "V" in the following formula cannot exceed 5% in one month, for any two consecutive months.

$$V = \frac{c+d+e}{a+b} \times 100$$

where:

a =number of instances where the residual disinfectant concentration is measured;
b =number of instances where the residual disinfectant concentration is not measured but heterotrophic bacteria plate count (HPC) is measured;
c =number of instances where the residual disinfectant concentration is measured but not detected and no HPC is measured;
d =number of instances where the residual disinfectant concentration is measured but not detected and where the HPC is >500/ml; and

e =number of instances where the residual disinfectant concentration is not measured and HPC is >500/ml.

b. If the Director determines, based on site-specific considerations, that a public water system has no means for having a sample transported and analyzed for HPC by a certified laboratory under the requisite time and temperature conditions specified by Appendix D § 801-D (A)(1) and that the system is providing adequate disinfection in the distribution system, the requirements of subsection (A)(4)(a) of this section do not apply to that system.

B. Disinfection requirements for public water system which provide filtration. Each public water system that provides filtration treatment must provide disinfection treatment as follows.

1. The disinfection treatment must be sufficient to ensure that the total treatment processes of that public water system achieve at least 99.9 % (3-log) inactivation and/or removal of *Giardia lamblia* cysts and at least 99.99 % (4-log) inactivation and/or removal of viruses, as determined by the Director.

2. The residual disinfectant concentration in the water entering the distribution system, measured as specified in Appendix D § 801-D (A)(2) and (C)(2), cannot be less than 0.2 mg/L for more than 4 hours.

3. a. The residual disinfectant concentration in the distribution system, measured as total chlorine, combined chlorine, or chlorine dioxide, as specified in Appendix D § 801-D (A)(2) and (C)(3), cannot be undetectable in more than 5% of the samples each month, for any two consecutive months that the system serves water to the public. Water in the distribution system with a heterotrophic bacteria concentration less than or equal to 500/ml, measured as HPC as specified in Appendix D § 801-D (A)(1), is deemed to have a detectable disinfectant residual for purposes of determining compliance with this requirement. Thus, the value "V" in the following formula cannot exceed 5 % in one month, for any two consecutive months.

$$V = \frac{c+d+e}{a+b} \times 100$$

where:

a =number of instances where the residual disinfectant concentration is measured;
b =number of instances where the residual disinfectant concentration is not measured but heterotrophic bacteria plate count (HPC) is measured;
c =number of instances where the residual disinfectant concentration is measured but not detected and no HPC is measured;
d =number of instances where no residual disinfectant concentration is detected and where the HPC is >500/ml; and
e =number of instances where the residual disinfectant concentration is not measured and HPC is >500/ml.

b. If the Director determines, based on site-specific considerations, that a public water system has no means for having a sample transported and analyzed for HPC by a certified laboratory under the requisite time and temperature conditions specified in Appendix D § 801-D (A)(1) and that the system is providing adequate disinfection in the distribution system, the requirements of subsection (B)(3)(a) of this section do not apply.

§ 805 FILTRATION

A public water system that uses a surface water source or a groundwater source under the direct influence of surface water, and does not meet all of the criteria in § 803 (A) and (B) for avoiding filtration, must provide treatment consisting of both disinfection, as specified in § 804 (B), and filtration treatment which complies with the requirements of subsections (A), (B), (C), or (D) of this section within 18 months of the failure to meet any one of the criteria for avoiding filtration in § 803 (A) and (B). Failure to meet any requirement specified in this introductory subsection is a treatment technique violation.

A. Conventional filtration treatment or direct filtration.

1. For public water systems using conventional filtration or direct filtration, the turbidity

level of representative samples of a system's filtered water must be less than or equal to 0.5 NTU in at least 95% of the measurements taken each month, measured as specified in Appendix D § 801-D (A)(1) and (C)(1), except that if the Director determines that the system is capable of achieving at least 99.9 % removal and/or inactivation of *Giardia lamblia* cysts at some turbidity level higher than 0.5 NTU in at least 95 % of the measurements taken each month, the Director may substitute this higher turbidity limit for that system. However, in no case may the Director approve a turbidity limit that allows more than 1 NTU in more than 5 % of the samples taken each month, measured as specified in Appendix D § 801-D (A)(1) and (C)(1).

2. The turbidity level of representative samples of a public water system's filtered water must at no time exceed 5 NTU measured as specified in Appendix D § 801-D (A)(1) and (C)(1).

3. Public water systems serving at least 10,000 people must meet the turbidity requirements in §1305 (A).

4. Beginning January 14, 2005, systems serving fewer than 10,000 people must meet the turbidity requirements in §§2106(A)-(D).

B. Slow sand filtration.

1. For public water systems using slow sand filtration, the turbidity level of representative samples of a system's filtered water must be less than or equal to 1 NTU in at least 95% of the measurements taken each month, measured as specified in Appendix D § 801-D (A)(1) and (C)(1), except that if the Director determines there is no significant interference with disinfection at a higher turbidity level, the Director may substitute this higher turbidity limit for that system.

2. The turbidity level of representative samples of a public water system's filtered water must at no time exceed 5 NTU, measured as specified in Appendix D § 801-D (A)(1) and (C)(1).

C. Diatomaceous earth filtration.

1. For public water systems using diatomaceous earth filtration, the turbidity level of representative samples of a system's filtered water must be less than or equal to 1 NTU in at least 95% of the measurements taken each month, measured as specified in Appendix D § 801-D (A)(1) and (C)(1).

2. The turbidity level of representative samples of a public water system's filtered water must at no time exceed 5 NTU, measured as specified in Appendix D § 801-D (A)(1) and (C)(1).

D. Other filtration technologies.

A public water system may use a filtration technology not listed in subsections (A)-© of this section if it demonstrates to the Director, using pilot plant studies or other means, that the alternative filtration technology, in combination with disinfection treatment that meets the requirements of § 804 (B), consistently achieves 99.9 % removal and/or inactivation of *Giardia lamblia* cysts and 99.99 % removal and/or inactivation of viruses. For a system that makes this demonstration, the requirements of subsection (B) of this section apply. Public water systems serving at least 10,000 people must meet the requirements for other filtration technologies in § 1305(B). Beginning January 14, 2005, systems serving fewer than 10,000 people must meet the requirements for other filtration technologies in §§2106(A)-(D).

§ 806 REPORTING AND RECORDKEEPING REQUIREMENTS

A. A public water system that uses a surface water source and does not provide filtration treatment must report monthly to the Director the information specified in this subsection (A), unless the Director has determined in writing that filtration is required pursuant to § 2535 of the NNSDWA, in which case the Director may specify alternative reporting requirements, as appropriate, until filtration is in place. A public water system that uses a groundwater source under the direct influence of surface water and does not provide filtration treatment must report monthly to the Director the information specified in this subsection (A) 6 months after the Director determines that the groundwater source is under the direct influence of surface water, or beginning immediately, if the Administrator has already made that determination unless the Director has determined, in writing, that filtration is required pursuant to § 2535 of the NNSDWA, in which case the Director may specify alternative reporting requirements, as appropriate, until filtration is in place.

1. Source water quality information must be reported to the Director within 10 days after the end of each month that the system serves water to the public. Information that must be reported includes:

   a. The cumulative number of months for which results are reported.

   b. The number of fecal and/or total coliform samples, whichever are analyzed during the month (if a system monitors for both, only fecal coliforms must be reported), the dates of sample collection, and the dates when the turbidity level exceeded 1 NTU.

   c. The number of samples during the month that had equal to or less than 20/100ml fecal coliforms and/or equal to or less than 100/100 ml total coliforms, whichever are analyzed.

   d. The cumulative number of fecal or total coliform samples, whichever are analyzed, during the previous six months that the system served water to the public.

   e. The cumulative number of samples that had equal to or less than 20/100 ml fecal coliforms or equal to or less than 100/100 ml total coliforms, whichever are analyzed, during the previous six months that the system served water to the public.

   f. The percentage of samples that had equal to or less than 20/100 ml fecal coliforms or equal to or less than 100/100 ml total coliforms, whichever are analyzed, during the previous six months that the system served water to the public.

   g. The maximum turbidity level measured during the month, the date(s) of occurrence for any measurement(s) which exceeded 5 NTU, and the date(s) that the occurrence(s) was reported to the Director.

   h. For the first 12 months of recordkeeping, the dates and cumulative number of events during which the turbidity exceeded 5 NTU, and after one year of recordkeeping for turbidity measurements, the dates and cumulative number of events during which the turbidity exceeded 5 NTU in the previous 12 months that the system served water to the public.

   I. For the first 120 months of recordkeeping, the dates and cumulative number of events during which the turbidity exceeded 5 NTU, and after 10 years of recordkeeping for turbidity measurements, the dates and cumulative number of events during which the turbidity exceeded 5 NTU in the previous 120 months that the system served water to the public.

2. Disinfection information specified in Appendix D § 801-D (B) must be reported to the Director within 10 days after the end of each month that the system serves water to the public. Information that must be reported includes:

   a. For each day, the lowest measurement of residual disinfectant concentration (in mg/L) in water entering the distribution system.

   b. The date and duration of each period when the residual disinfectant concentration in water entering the distribution system fell below 0.2 mg/L and when the Director was notified of the occurrence.

   c. The daily residual disinfectant concentration(s) (in mg/L) and disinfectant contact time(s) (in minutes) used for calculating the CT value(s).

   d. If chlorine is used, the daily measurement(s) of pH of disinfected water following each point of chlorine disinfection.

   e. The daily measurement(s) of water temperature in °C following each point of disinfection.

   f. The daily CTcalc and CTcalc/CT99.9 values for each disinfectant measurement or sequence and the sum of all CTcalc/CT99.9 values ((CTcalc/CT99.9)) before or at the first customer.

   g. The daily determination of whether disinfection achieves adequate *G.lamblia* cysts and virus inactivation, i.e., whether (CTcalc/CT99.9) is at least 1.0 or, where

disinfectants other than chlorine are used, other indicator conditions that the Director determines are appropriate, are met.

h. The following information on the samples taken in the distribution system in conjunction with total coliform sampling pursuant to § 804:

1. Number of instances where the residual disinfectant concentration is measured;

2. Number of instances where the residual disinfectant concentration is not measured but heterotrophic bacteria plate count (HPC) is measured;

3. Number of instances where the residual disinfectant concentration is measured but not detected and no HPC is measured;

4. Number of instances where residual disinfectant concentration is detected and where HPC is >500/ml;

5. Number of instances where the residual disinfectant concentration is not measured and HPC is >500/ml;

6. For the current and previous month that the system served water to the public, the value of "V" in the following formula:

$$V = \frac{c+d+e}{a+b} \times 100$$

where

a = the value in subsection (A)(2)(h)(1) of this section,
b = the value in subsection (A)(2)(h)(2) of this section,
c = the value in subsection (A)(2)(h)(3) of this section,
d = the value in subsection (A)(2)(h)(4) of this section, and
e = the value in subsection (A)(2)(h)(5) of this section.

7. If the Director determines, based on site-specific considerations, that a system has no means for having a sample transported and analyzed for HPC by a certified laboratory under the requisite time and temperature conditions specified by Appendix D § 801-D (A)(1) and that the system is providing adequate disinfection in the distribution system, the requirements of subsection (A)(2)(h)(1)-(6) of this section do not apply to that system.

I. A system need not report the data listed in subsections (A)(2)(a)-(c-f) of this section if all data listed in subsections (A)(2)(a)-(h) of this section remain on file at the system, and the Director determines that:

a. The system has submitted to the Director all the information required by subsections (A)(2)(a)-(h) of this section for at least 12 months; and

b. The Director has determined that the system is not required to provide filtration treatment.

3. No later than ten days after the end of each federal fiscal year (September 30), each system must provide to the Director a report which summarizes its compliance with all watershed control program requirements specified in § 803(B)(2).

4. No later than ten days after the end of each federal fiscal year (September 30), each system must provide to the Director a report of the on-site inspection conducted during that year pursuant to § 803 (B)(3), unless the on-site inspection was conducted by the Director. If the inspection was conducted by the Director, the Director must provide a copy of his/her report to the public water system.

5. a. Each system, upon discovering that a waterborne disease outbreak potentially attributable to that system has occurred, must report that occurrence to the Director as soon as possible, but no later than by the end of the next business day.

b. If at any time the turbidity exceeds 5 NTU, the system must consult with the

NNEPA-PWSSP as soon as practical, but no later than 24 hours after the exceedance is known, in accordance with the public notification requirements under § 605 (B)(3).

c. If at any time the residual falls below 0.2 mg/L in the water entering the distribution system, the system must notify the Director as soon as possible, but no later than by the end of the next business day. The system also must notify the Director by the end of the next business day whether or not the residual was restored to at least 0.2 mg/L within 4 hours.

B. A public water system that uses a surface water source or a groundwater source under the direct influence of surface water and provides filtration treatment must report monthly to the Director the information specified in this subsection (B) when filtration is installed,

1. Turbidity measurements as required by Appendix D § 801-D (C)(1) must be reported within 10 days after the end of each month that the system serves water to the public. Information that must be reported includes:

a. The total number of filtered water turbidity measurements taken during the month.

b. The number and percentage of filtered water turbidity measurements taken during the month which are less than or equal to the turbidity limits specified in § 805 for the filtration technology being used.

c. The date and value of any turbidity measurements taken during the month which exceed 5 NTU.

2. Disinfection information specified in Appendix D § 801-D © must be reported to the Director within 10 days after the end of each month that the system serves water to the public. Information that must be reported includes:

a. For each day, the lowest measurement of residual disinfectant concentration in mg/L in water entering the distribution system.

b. The date and duration of each period when the residual disinfectant concentration in water entering the distribution system fell below 0.2 mg/L and when the Director was notified of the occurrence.

c. The following information on the samples taken in the distribution system in conjunction with total coliform sampling pursuant to § 804:

1. Number of instances where the residual disinfectant concentration is measured;

2. Number of instances where the residual disinfectant concentration is not measured but heterotrophic bacteria plate count (HPC) is measured;

3. Number of instances where the residual disinfectant concentration is measured but not detected and no HPC is measured;

4. Number of instances where no residual disinfectant concentration is detected and where HPC is > 500/ml;

5. Number of instances where the residual disinfectant concentration is not measured and HPC is >500/ml;

6. For the current and previous month that the system serves water to the public, the value of "V" in the following formula:

$$V = \frac{c+d+e}{a+b} \times 100$$

where
a = the value in subsection (B)(2)(c)(1) of this section,
b = the value in subsection (B)(2)(c)(2) of this section,
c = the value in subsection (B)(2)(c)(3) of this section,
d = the value in subsection (B)(2)(c)(4) of this section, and,

e = the value in subsection (B)(2)(c)(5) of this section.

7. If the Director determines, based on site-specific considerations, that a system has no means for having a sample transported and analyzed for HPC by a certified laboratory within the requisite time and temperature conditions specified by Appendix D § 801-D (A)(1) and that the system is providing adequate disinfection in the distribution system, the requirements of subsection (B)(2)(c)(1)-(6) of this section do not apply.

d. A system need not report the data listed in subsections (B)(2)(a) of this section if all data listed in subsections (B)(2)(a)-(c) of this section remain on file at the system and the Director determines that the system has submitted all the information required by subsections (B)(2)(a)-(c) of this section for at least 12 months.

3. a. Each system, upon discovering that a waterborne disease outbreak potentially attributable to that system has occurred, must report that occurrence to the Director as soon as possible, but no later than by the end of the next business day.

b. If at any time the turbidity exceeds 5 NTU, the water system must consult with the NNEPA-PWSSP as soon as practical, but no later than 24 hours after the exceedance is known, in accordance with the public notification requirements under § 605(B)(3).

c. If at any time the residual falls below 0.2 mg/L in the water entering the distribution system, the system must notify the Director as soon as possible, but no later than by the end of the next business day. The system also must notify the Director by the end of the next business day whether or not the residual was restored to at least 0.2 mg/L within 4 hours.

§ 807 RECYCLE PROVISIONS

A. Applicability

All Part VIII systems that employ conventional filtration or direct filtration treatment and that recycle spent filter backwash water, thickener supernatant, or liquids from dewatering processes must meet the requirements in subsections (B) through (D) of this section.

B. Reporting

A public water system subject to this section as provided in subsection (A) must notify the Director in writing by December 8, 2003, if the system recycles spent filter backwash water, thickener supernatant, or liquids from dewatering processes. This notification must include, at a minimum, the information specified in subsections (B)(1) and (2) of this section.

1. A plant schematic showing the origin of all flows which are recycled (including, but not limited to, spent filter backwash water, thickener supernatant, and liquids from dewatering processes), the hydraulic conveyance used to transport them, and the location where they are re-introduced back into the treatment plant.

2. Typical recycle flow in gallons per minute (gpm), the highest observed plant flow experienced in the previous year (gpm), design flow for the treatment plant (gpm), and Director-approved operating capacity for the plant where the Director has made such determinations.

C. Treatment technique requirement

By June 8, 2004, any system that recycles spent filter backwash water, thickener supernatant, or liquids from dewatering processes must return these flows through the processes of a system's existing conventional or direct filtration system as defined in § 104 or at an alternate location approved by the Director. If capital improvements are required to modify the recycle location to meet this requirement, all capital improvements must be completed no later than June 8, 2006.

D. Recordkeeping

The system must collect, and retain on file, recycle flow information specified in subsections (D)(1) through (6) of this section for review and evaluation by the Director, beginning June 8, 2004.

1. Copy of the recycle notification and information submitted to the Director under subsection (B) of this section.

2. List of all recycle flows and the frequency with which they are returned.

3. Average and maximum backwash flow rate through the filters and the average and maximum duration of the filter backwash process in minutes.

4. Typical filter run length and a written summary of how filter run length is determined.

5. The type of treatment provided for the recycle flow.

6. Data on the physical dimensions of the equalization and/or treatment units, typical and maximum hydraulic loading rates, type of treatment chemicals used and average dose and frequency of use and frequency at which solids are removed if applicable.

PART IX
USE OF NON-CENTRALIZED TREATMENT DEVICES

§ 901 CRITERIA AND PROCEDURES FOR PUBLIC WATER SYSTEMS USING POINT-OF-ENTRY DEVICES.

A. Public water systems may use point-of-entry devices to comply with MCLs only if they meet the requirements of this section.

B. It is the responsibility of the public water system to operate and maintain the point-of-entry treatment system.

C. The public water system must develop and obtain the Director's approval for a sampling plan before point-of-entry devices are installed for compliance. Under the plan approved by the Director, point-of-entry devices must provide health protection equivalent to central water treatment. "Equivalent" means that the water would meet all Navajo Nation Primary Drinking Water Regulations and would be of acceptable quality similar to water distributed by a well-operated central treatment plant. In addition to the VOCs, sampling must include physical measurements and observations such as total flow treated and mechanical condition of the treatment equipment.

D. Effective technology must be properly applied under a plan approved by the Director and the microbiological safety of the water must be maintained.

1. The Director shall require adequate certification of performance, field testing and, if not included in the certification process, a rigorous engineering design review of the point-of-entry devices.

2. The design and application of the point-of-entry devices must consider the tendency for increase in heterotrophic bacteria concentrations in water treated with activated carbon. It may be necessary to use frequent backwashing, post-contactor disinfection, and Heterotrophic Plate Count sampling to ensure that the microbiological safety of the water is not compromised.

E. All consumers shall be protected. Every building connected to the system must have a point-of-entry device installed, maintained, and adequately sampled. The Director must be assured that every building is subject to treatment and sampling, and that the rights and responsibilities of the public water system customer convey with title upon sale of property.

§ 902 USE OF OTHER NON-CENTRALIZED TREATMENT DEVICES

A. Public water systems shall not use bottled water or point-of-use devices to achieve compliance with an MCL. Bottled water or point-of-use devices may be used only on a temporary basis to avoid an unreasonable risk to health.

§ 903 BOTTLED WATER

A. All sources within the Navajo Nation and treatment technologies which are used in the manufacturing of bottled water shall be permitted in accordance with the Part XVI of these regulations.

B. If an out-of-Navajo Nation source of water is used by a bottled water manufacturing plant located within the Navajo Nation, that source must be approved by the Director prior to use.

C. Bottled water systems shall obtain operating permits in accordance with § 109 of these regulations.

D. All the requirements related to drinking water quality, sampling, monitoring, sanitary survey, reporting and record keeping applicable to a public water system shall apply to bottled water system as well.

PART X
TREATMENT TECHNIQUES

§ 1001 GENERAL REQUIREMENTS

These regulations establish treatment techniques in lieu of MCLs for specified contaminants and are considered part of the NNPDWR.

§ 1002 TREATMENT TECHNIQUES FOR ACRYLAMIDE AND EPICHLOROHYDRIN

Each public water system must certify annually in writing to the Director (using third party or manufacturer's certification) that when acrylamide and epichlorohydrin are used in drinking water systems, the combination (or product) of dose and monomer level does not exceed the levels specified as follows:

Acrylamide=0.05% dosed at 1 ppm (or equivalent)

Epichlorohydrin=0.01% dosed at 20 ppm (or equivalent)

Certifications can rely on manufacturers or third parties as approved by the Director.

PART XI
DISINFECTANT RESIDUALS, DISINFECTION BYPRODUCTS AND DISINFECTION BYPRODUCT PRECURSORS

§ 1101 PURPOSE

A. The requirements of this part constitute NNPDWR and outline the Disinfectant Residuals, Disinfection Byproducts and Disinfection Byproduct Precursors regulations.

1. The regulations in this part establish criteria under which CWSs and NTNCWSs that add a chemical disinfectant to the water in any part of the drinking water treatment process must modify their practices to meet MCLs and MRDLs in §§ 207 and 208, respectively, and must meet the treatment technique requirements for disinfection byproduct precursors in § 1106.

2. The regulations in this part establish criteria under which TNCWSs that use chlorine dioxide as a disinfectant or oxidant must modify their practices to meet the MRDL for chlorine dioxide in § 208.

3. EPA has established MCLs for TTHM and HAA5 and treatment technique requirements for disinfection byproduct precursors to limit the levels of known and unknown disinfection byproducts which may have adverse health effects. These disinfection byproducts may include chloroform; bromodichloromethane; dibromochloromethane; bromoform; dichloroacetic acid; and trichloroacetic acid.

§ 1102 COMPLIANCE DATES

Notwithstanding the provisions of § 107, this part applies only to CWSs and NTNCWSs.

A. Compliance dates.

1. CWSs and NTNCWSs. Unless otherwise noted, systems must comply with the requirements of this part. CWSs and NTNCWSs that are subject to Part VIII and that serve 10,000 or more persons must comply with this part upon the effective date of these regulations. CWSs and NTNCWSs that are subject to Part VIII and that serve fewer than 10,000 persons and CWSs and NTNCWSs using only ground water not under the direct influence of surface water must comply with this part beginning January 01, 2004.

2. TNCWSs that are subject to Part VIII, that serve 10,000 or more persons and that use chlorine dioxide as a disinfectant or oxidant must comply with any requirements for chlorine dioxide and chlorite in this part. TNCWSs that are subject to Part VIII, that serve fewer than 10,000 persons and that use chlorine dioxide as a disinfectant or oxidant and TNCWSs, using only ground water not under the direct influence of surface water and using chlorine dioxide as a disinfectant or oxidant must comply with any requirements for chlorine dioxide and chlorite in this part beginning January 01, 2004.

B. Each CWS and NTNCWS regulated under §1101 of this section must be operated by qualified personnel who meet the requirements specified in § 1400 of these regulations and are included in a NNEPA register of qualified operators.

C. Control of disinfectant residuals. Notwithstanding the MRDLs in § 208, systems may increase residual disinfectant levels in the distribution system of chlorine or chloramines (but not chlorine dioxide) to a level and for a time necessary to protect public health, to address specific microbiological contamination problems caused by circumstances such as, but not limited to, distribution line breaks, storm run-off events, source water contamination events, or cross-connection events.

§ 1103 MONITORING REQUIREMENTS

A. General requirements.

1. Systems must take all samples during normal operating conditions.

2. Systems may consider multiple wells drawing water from a single aquifer as one treatment plant for determining the minimum number of TTHM and HAA5 samples required, with Director approval in accordance with criteria developed under 40 CFR § 142.16(h)(5).

3. Failure to monitor in accordance with the monitoring plan required under subsection (F) of this section is a monitoring violation.

4. Failure to monitor will be treated as a violation for the entire period covered by the

annual average where compliance is based on a running annual average of monthly or quarterly samples or averages and the system's failure to monitor makes it impossible to determine compliance with MCLs or MRDLs.

5. Systems may use only data collected under the provisions of this part to qualify for reduced monitoring.

B. Monitoring requirements for disinfection byproducts.

1. TTHMs and HAA5.

a. Routine monitoring. Systems must monitor at the frequency indicated in the following table:

Table 1100.1 Routine Monitoring Frequency for TTHM and HAA5

Type of System	Minimum monitoring frequency	Sample location in the distribution system
Part VIII - Surface Water Treatment system serving at least 10,000 persons.	Four water samples per quarter per treatment plant.	At least 25 percent of all samples collected each quarter at locations representing maximum residence time. Remaining samples taken at locations representative of at least average residence time in the distribution system and representing the entire distribution system, taking into account number of persons served, different sources of water, and different treatment methods.[1]
Part VIII - Surface Water Treatment system serving from 500 to 9,999 persons.	One water sample per quarter per treatment plant.	Locations representing maximum residence time.[1]
Part VIII - Surface Water Treatment system serving fewer than 500 persons.	One sample per year per treatment plant during month of warmest water temperature.	Locations representing maximum residence time.[1] If the sample (or average of annual samples, if more than one sample is taken) exceeds MCL, system must increase monitoring to one sample per treatment plant per quarter, taken at a point reflecting the maximum residence time in the distribution system, until system meets reduced monitoring criteria in subsection (B)(1)(d) of this section.
System using only ground water not under direct influence of surface water using chemical disinfectant and serving at least 10,000 persons.	One water sample per quarter per treatment plant[2].	Locations representing maximum residence time.[1]
System using only ground water not under direct influence of surface water using chemical disinfectant and serving fewer than 10,000 persons.	One sample per year per treatment plant [2] during month of warmest water temperature.	Locations representing maximum residence time.[1] If the sample (or average of annual samples, if more than one sample is taken) exceeds the MCL, system must increase monitoring to one sample per treatment plant per quarter, taken at a point reflecting the maximum residence time in the distribution system, until system meets criteria in subsection (B)(1)(d) of this section for reduced monitoring.

[1] If a system elects to sample more frequently than the minimum required, at least 25 percent of all samples collected each quarter (including those taken in excess of the required frequency) must be taken at locations that represent the maximum residence time of the water in the distribution system. The remaining samples must be taken at locations representative of at least average residence time in the distribution system.

[2] Multiple wells drawing water from a single aquifer may be considered one treatment plant for determining the minimum number of samples required, with Director approval in accordance with criteria developed under 40 CFR § 142.16(h)(5).

b. Systems may reduce monitoring, except as otherwise provided, in accordance with the

following table:

Table 1100.2 Reduced Monitoring Frequency for TTHM and HAA5

Type of system	Minimum monitoring frequency	Sample location in the distribution system
Part VIII-General Requirements for Surface Water Treatment system serving at least 10,000 persons which has a source water annual average Total Organic Carbon, "TOC", level, before any treatment, ≤4.0 mg/L.	TTHM annual average ≤0.040 mg/L and HAA5 annual average ≤0.030 mg/L.	One sample per treatment plant per quarter at distribution system location reflecting maximum residence time.
Part VIII-General Requirements for Surface Water Treatment system serving from 500 to 9,999 persons which has a source water annual average TOC level, before any treatment, ≤4.0 mg/L.	TTHM annual average≤0.040 mg/L and HAA5 annual average≤0.030 mg/L.	One sample per treatment plant per year at distribution system location reflecting maximum residence time during month of warmest water temperature. NOTE: Any Part VIII-Surface Water Treatment system serving fewer than 500 persons may not reduce its monitoring to less than one sample per treatment plant per year.
System using only ground water not under direct influence of surface water using chemical disinfectant and serving at least 10,000 persons.	TTHM annual average ≤ 0.040 mg/L and HAA5 annual average ≤0.030 mg/L.	One sample per treatment plant per year at distribution system location reflecting maximum residence time during month of warmest water temperature
System using only ground water not under direct influence of surface water using chemical disinfectant and serving fewer than 10,000 persons.	TTHM annual average ≤0.040 mg/L and HAA5 annual average ≤0.030 mg/L for two consecutive years OR TTHM annual average ≤0.020 mg/L and HAA5 annual average ≤0.015 mg/L for one year.	One sample per treatment plant per three year monitoring cycle at distribution system location reflecting maximum residence time during month of warmest water temperature, with the three-year cycle beginning on January 1 following quarter in which system qualifies for reduced monitoring.

c. Monitoring requirements for source water TOC. In order to qualify for reduced monitoring in TTHM and HAA5 under paragraph (B)(1)(b) of this section, Part VIII systems not monitoring under the provisions of subsection (D) of this section must take monthly TOC samples every 30 days at a location prior to any treatment, beginning April 1, 2008 or earlier, if specified by the Director. In addition to meeting other criteria for reduced monitoring in paragraph (B)(1)(b) of this section, the source water TOC running annual average must be ≤4.0mg/L on a continuing basis at each treatment plant. To reduce or remain on reduced monitoring for TTHM and HAA5 under paragraph (B)(1)(b) of this section, a system may reduce source water TOC monitoring to quarterly TOC samples taken every 90 days at a location prior to any treatment.

d. Systems on a reduced monitoring schedule may remain on that reduced schedule as long as the average of all samples taken in the year (for systems which must monitor quarterly) or the result of the sample (for systems which must monitor no more frequently than annually) is no more than 0.060mg/L and 0.045mg/L for TTHMs and HAA5, respectively. Systems that do not meet these levels must resume monitoring at the frequency identified in paragraph (B)(1)(a) of this section (minimum monitoring frequency column) in the quarter immediately following the monitoring period in which the system exceeds 0.060mg/L or 0.045mg/L for TTHMs and HAA5s, respectively. For systems using only ground water not under the direct influence of surface water and serving fewer than 10,000 persons, if either the TTHM annual average is >0.080mg/L or the HAA5 annual average is >0.060mg/L, the system must go to the increased monitoring identified in paragraph (B)(1)(a) of this section (sample location column) in the quarter immediately following the monitoring period in which the system exceeds 0.080mg/L or 0.060 mg/L for TTHMs or HAA5 respectively.

e. Systems on increased monitoring may return to routine monitoring if, after at least one year of monitoring, their TTHM annual average is ≤0.060 mg/L and their HAA5

annual average is ≤0.045 mg/L.

f. The Director may return a system to routine monitoring at the Director's discretion.

2. Chlorite. CWS and NTNCWS water systems using chlorine dioxide, for disinfection or oxidation, must conduct monitoring for chlorite.

a. Routine monitoring.

I. Daily monitoring. Systems must take daily samples at the entrance to the distribution system. For any daily sample that exceeds the chlorite MCL, the system must take additional samples in the distribution system the following day at the locations required by subsection (B)(2)(b) of this section, in addition to the sample required at the entrance to the distribution system.

ii. Monthly monitoring. Systems must take a three-sample set each month in the distribution system. The system must take one sample at each of the following locations: near the first customer, at a location representative of average residence time, and at a location reflecting maximum residence time in the distribution system. Any additional routine sampling must be conducted in the same manner (as three-sample sets, at the specified locations). The system may use the results of additional monitoring conducted under subsection (B)(2)(b) of this section to meet the requirement for monitoring in this subsection.

b. Additional monitoring. On each day following a routine sample monitoring result that exceeds the chlorite MCL at the entrance to the distribution system, the system is required to take three chlorite distribution system samples at the following locations: as close to the first customer as possible, in a location representative of average residence time, and as close to the end of the distribution system as possible (reflecting maximum residence time in the distribution system).

c. Reduced monitoring.

I. Chlorite monitoring at the entrance to the distribution system required by subsection (B)(2)(a)(I) of this section may not be reduced.

ii. Chlorite monitoring in the distribution system required by subsection (B)(2)(a)(ii) of this section may be reduced to one three-sample set per quarter after one year of monitoring where no individual chlorite sample taken in the distribution system under subsection (B)(2)(a)(ii) of this section has exceeded the chlorite MCL and the system has not been required to conduct monitoring under subsection (B)(2)(b) of this section. The system may remain on the reduced monitoring schedule until either any of the three individual chlorite samples taken quarterly in the distribution system under subsection (B)(2)(a)(ii) of this section exceeds the chlorite MCL or the system is required to conduct monitoring under subsection (B)(2)(b) of this section, at which time the system must revert to routine monitoring.

3. Bromate.

a. Routine monitoring. CWS and NTNCWS systems using ozone, for disinfection or oxidation, must take one sample per month for each treatment plant in the system using ozone. Systems must take samples monthly at the entrance to the distribution system while the ozonation system is operating under normal conditions.

b. Reduced monitoring.

I. Until March 31, 2009, systems required to analyze for bromate may reduce monitoring from monthly to once per quarter, if the system's average source water bromide concentration is less than 0.05 mg/L based upon representative monthly bromide measurements for one year. The system may remain on reduced bromate monitoring until the running annual average source water bromide concentration, computed quarterly, is equal to or greater than 0.05 mg/L based upon representative monthly measurements. If the running annual average source water bromide concentration is ≥0.05 mg/L, the system must resume routine monitoring required by subsection (B)(3)(a) of this section in the following month.

ii. Beginning April 1, 2009, systems may no longer use the provision of paragraph (B)(3)(b)(I) of this section to qualify for reduced monitoring. A system required to analyze for bromate may reduce monitoring from monthly to

quarterly if the system's running annual average bromate concentration is ≤0.0025mg/L based on monthly bromate measurements under paragraph (B)(3)(a) of this section for the most recent four quarters, with samples analyzed using Method 317.0 Revision 2.0, 326.0, or 321.8. If a system has qualified for reduced bromate monitoring under paragraph (B)(3)(b)(I) of this section, that system may remain on reduced monitoring as long as the running annual average or quarterly bromate samples are ≤0.0025mg/L based on samples analyzed using Method 317.0 Revision 2.0, 326.0, or 321.8. If the running annual average bromate concentration is >0.0025mg/L, the system must resume routine monitoring required by paragraph (B)(3)(a) of this section.

C. Monitoring requirements for disinfectant residuals.

1. Chlorine and chloramines.

a. Routine monitoring. CWS and NTNCWS systems that use chlorine or chloramines must measure the residual disinfectant level at the same point in the distribution system and at the same time as total coliforms are sampled, as specified in § 404. Part VIII systems may use the results of residual disinfectant concentration sampling conducted under Appendix D § 801-D (B) for unfiltered systems or Appendix D § 801-D(C) for systems which filter, in lieu of taking separate samples.

b. Reduced monitoring. Monitoring may not be reduced.

2. Chlorine dioxide.

a. Routine monitoring. CWS, NTNCWS, and TNCWS systems that use chlorine dioxide for disinfection or oxidation must take daily samples at the entrance to the distribution system. For any daily sample that exceeds the MRDL, the system must take samples in the distribution system the following day at the locations required by subsection (C)(2)(b) of this section, in addition to the sample required at the entrance to the distribution system.

b. Additional monitoring. On each day following a routine sample monitoring result that exceeds the MRDL, the system is required to take three (3) chlorine dioxide distribution system samples. If chlorine dioxide or chloramines are used to maintain a disinfectant residual in the distribution system, or if chlorine is used to maintain a disinfectant residual in the distribution system and there are no disinfection addition points after the entrance to the distribution system (i.e., no booster chlorination), the system must take three (3) samples as close to the first customer as possible, at intervals of at least six hours. If chlorine is used to maintain a disinfectant residual in the distribution system and there are one or more disinfection addition points after the entrance to the distribution system (i.e., booster chlorination), the system must take one sample at each of the following locations: as close to the first customer as possible, in a location representative of average residence time, and as close to the end of the distribution system as possible (reflecting maximum residence time in the distribution system).

c. Reduced monitoring. Chlorine dioxide monitoring may not be reduced.

D. Monitoring requirements for disinfection byproduct precursors (DBPP).

1. Routine monitoring. Part VIII systems which use conventional filtration treatment (as defined in § 104) must monitor each treatment plant for Total Organic Carbon, "TOC", no later than the point of combined filter effluent turbidity monitoring and representative of the treated water. All systems required to monitor under this subsection (D)(1) must also monitor for TOC in the source water prior to any treatment at the same time as monitoring for TOC in the treated water. These samples (source water and treated water) are referred to as paired samples. At the same time as the source water sample is taken, all systems must monitor for alkalinity in the source water prior to any treatment. Systems must take one paired sample and one source water alkalinity sample per month per plant at a time representative of normal operating conditions and influent water quality.

2. Reduced monitoring. Part VIII systems with an average treated water TOC of less than 2.0 mg/L for two consecutive years, or less than 1.0 mg/L for one year, may reduce monitoring for both TOC and alkalinity to one paired sample and one source water alkalinity sample per plant per quarter. The system must revert to routine monitoring in the month following the quarter when the annual average treated water TOC ≥2.0 mg/L.

E. Bromide. Systems required to analyze for bromate may reduce bromate monitoring from monthly to once per quarter, if the system demonstrates that the average source water bromide concentration

is less than 0.05 mg/L based upon representative monthly measurements for one year. The system must continue bromide monitoring to remain on reduced bromate monitoring.

F. Monitoring plans. Each system required to monitor under this part must develop and implement a monitoring plan. The system must maintain the plan and make it available for inspection by the Director and the general public no later than 30 days following the applicable compliance dates in §1102 (A). All Part VIII systems serving more than 3,300 people must submit a copy of the monitoring plan to the Director no later than the date of the first report required under §1105. The Director may also require the plan to be submitted by any other system. After review, the Director may require changes in any plan elements. The plan must include at least the following elements.

1. Specific locations and schedules for collecting samples for any parameters included in this part.

2. How the system will calculate compliance with MCLs, MRDLs, and treatment techniques.

3. If approved for monitoring as a consecutive system, or if providing water to a consecutive system, under the provisions Part XIX, the sampling plan must reflect the entire distribution system.

§ 1104 COMPLIANCE REQUIREMENTS

A. General requirements.

1. Where compliance is based on a running annual average of monthly or quarterly samples or averages and the system fails to monitor for TTHM, HAA5, or bromate, this failure to monitor will be treated as a monitoring violation for the entire period covered by the annual average. Where compliance is based on a running annual average of monthly or quarterly samples or averages and the system's failure to monitor makes it impossible to determine compliance with MRDLs for chlorine and chloramines, this failure to monitor will be treated as a monitoring violation for the entire period covered by the annual average.

2. All samples taken and analyzed under the provisions of this part must be included in determining compliance, even if that number is greater than the minimum required.

3. If, during the first year of monitoring under § 1103, any individual quarter's average will cause the running annual average of that system to exceed the MCL, the system is out of compliance at the end of that quarter.

B. Disinfection byproducts

1. TTHMs and HAA5

a. For systems monitoring quarterly, compliance with MCLs in § 207 must be based on a running annual arithmetic average, computed quarterly, of quarterly arithmetic averages of all samples collected by the system as prescribed by § 1103(B)(1).

b. For systems monitoring less frequently than quarterly, systems demonstrate MCL compliance if the average of samples taken that year under the provisions of § 1103(B)(1) does not exceed the MCLs in § 207. If the average of these samples exceeds the MCL, the system must increase monitoring to once per quarter per treatment plant and such a system is not in violation of the MCL until it has completed one year of quarterly monitoring, unless the results of fewer than four quarters of monitoring will cause the running annual average to exceed the MCL, in which case the system is in violation at the end of that quarter. Systems required to increase monitoring frequency to quarterly monitoring must calculate compliance by including the sample which triggered the increased monitoring plus the following three quarters of monitoring.

c. If the running annual arithmetic average of quarterly averages covering any consecutive four-quarter period exceeds the MCL, the system is in violation of the MCL and must notify the public pursuant to § 603, in addition to reporting to the Director pursuant to § 1105.

d. If a public water system fails to complete four consecutive quarters of monitoring, compliance with the MCL for the last four-quarter period must be based on an average of the available data.

2. Bromate. Compliance must be based on a running annual arithmetic average, computed quarterly, of monthly samples (or, for months in which the system takes more than one sample, the average of all samples taken during the month) collected by the system as prescribed by § 1103(B)(3). If the average of samples covering any consecutive

four-quarter period exceeds the MCL, the system is in violation of the MCL and must notify the public pursuant to § 603, in addition to reporting to the Director pursuant to § 1105. If a public water system fails to complete 12 consecutive months' monitoring, compliance with the MCL for the last four-quarter compliance period must be based on an average of the available data.

3. Chlorite. Compliance must be based on an arithmetic average of each three sample set taken in the distribution system as prescribed by § 1103(B)(2)(a)(ii) and § 1103(B)(2)(b). If the arithmetic average of any three sample set exceeds the MCL, the system is in violation of the MCL and must notify the public pursuant to § 603, in addition to reporting to the Director pursuant to § 1105.

C. Disinfectant residuals.

1. Chlorine and chloramines.

a. Compliance must be based on a running annual arithmetic average, computed quarterly, of monthly averages of all samples collected by the system under § 1103(C)(1). If the average of quarterly averages covering any consecutive four-quarter period exceeds the MRDL, the system is in violation of the MRDL and must notify the public pursuant to § 603, in addition to reporting to the Director pursuant to § 1105.

b. In cases where systems switch between the use of chlorine and chloramines for residual disinfection during the year, compliance must be determined by including together all monitoring results of both chlorine and chloramines in calculating compliance. Reports submitted pursuant to § 1105 must clearly indicate which residual disinfectant was analyzed for each sample.

2. Chlorine dioxide.

a. Acute violations. Compliance must be based on consecutive daily samples collected by the system under § 1103(C)(2). If any daily sample taken at the entrance to the distribution system exceeds the MRDL, and on the following day one (or more) of the three samples taken in the distribution system exceed the MRDL, the system is in violation of the MRDL and must take immediate corrective action to lower the level of chlorine dioxide below the MRDL and must notify the public pursuant to the procedures for acute health risks in § 603 in addition to reporting to the Director pursuant to § 1105. Failure to take samples in the distribution system the day following an exceedance of the chlorine dioxide MRDL at the entrance to the distribution system will also be considered an MRDL violation and the system must notify the public of the violation in accordance with the provisions for acute violations under § 603 in addition to reporting to the Director pursuant to § 1105.

b. Nonacute violations. Compliance must be based on consecutive daily samples collected by the system under §1103(C)(2). If any two consecutive daily samples taken at the entrance to the distribution system exceed the MRDL and all distribution system samples taken are below the MRDL, the system is in violation of the MRDL and must take corrective action to lower the level of chlorine dioxide below the MRDL at the point of sampling and will notify the public pursuant to the procedures for nonacute health risks in § 603 in addition to reporting to the Director pursuant to §1105. Failure to monitor at the entrance to the distribution system the day following an exceedance of the chlorine dioxide MRDL at the entrance to the distribution system is also an MRDL violation and the system must notify the public of the violation in accordance with the provisions for nonacute violations under § 603 in addition to reporting to the Director pursuant to §1105.

D. Disinfection byproduct precursors (DBPP). Compliance must be determined as specified by § 1106(c). Systems may begin monitoring to determine whether Step 1 TOC removals can be met 12 months prior to the compliance date for the system. This monitoring is not required and failure to monitor during this period is not a violation. However, any system that does not monitor during this period, and then determines in the first 12 months after the compliance date that it is not able to meet the Step 1 requirements in §1106(B)(2) and must therefore apply for alternate minimum TOC removal (Step 2) requirements, is not eligible for retroactive approval of alternate minimum TOC removal (Step 2) requirements as allowed pursuant to §1106(B)(3) and is in violation. Systems may apply for alternate minimum TOC removal (Step 2) requirements any time after the compliance date. For systems required to meet Step 1 TOC removals, if the value calculated under §1106(C)(1)(d) is less than 1.00, the system is in violation of the treatment technique requirements and must notify the public pursuant to Part VI of these regulations, in addition to reporting to the Director pursuant to § 1105.

§ 1105 REPORTING AND RECORDKEEPING REQUIREMENTS

A. Systems required to sample quarterly or more frequently must report to the Director within 10 days after the end of each quarter in which samples were collected, notwithstanding the provisions of § 502. Systems required to sample less frequently than quarterly must report to the Director within 10 days after the end of each monitoring period in which samples were collected.

B. Disinfection byproducts. Systems must report the information specified in the following table:

Type of system	Report requirements[1]
System monitoring for TTHM and HAA5 under the requirements of § 1103(B) on a quarterly or more frequent basis.	1. The number of samples taken during the last quarter. 2. The location, date, and result of each sample taken during the last monitoring period. 3. The arithmetic average of all samples taken in the last quarter. 4. The annual arithmetic average of the quarterly arithmetic averages of this section for the last four quarters. 5. Whether, based on § 1104 (B)(1), the MCL was violated.
System monitoring for TTHMs and HAA5 under the requirements of § 1103(B) less frequently than quarterly (but at least annually).	1. The number of samples taken during the last year. 2. The location, date, and result of each sample taken during the last monitoring period. 3. The arithmetic average of all samples taken over the last year. 4. Whether, based on § 1104 (B)(1), the MCL was violated.
System monitoring for TTHMs and HAA5 under the requirements of § 1103(B) less frequently than annually.	1. The location, date, and result of each sample taken. 2. Whether, based on § 1104 (B)(1), the MCL was violated.
System monitoring for chlorite under the requirements of § 1103(B).	1. The number of entry point samples taken each month for the last 3months. 2. The location, date, and result of each sample (both entry point and distribution system) taken during the last quarter. 3. For each month in the reporting period, the arithmetic average of all samples taken in each three samples set taken in the distribution system. 4. Whether, based on § 1104 (B)(3), the MCL was violated, and in which month, and how many times it was violated each month.
System monitoring for bromate under the requirements of § 1103(B)	1. The number of samples taken during the last quarter. 2. The location, date, and result of each sample taken during the last quarter. 3. The arithmetic average of the monthly arithmetic averages of all samples taken in the last year. 4. Whether, based on § 1104 (B)(2), the MCL was violated.

[1] The Director may choose to perform calculations and determine whether the MCL was exceeded, in lieu of having the system report that information.

C. Disinfectants. Systems must report the information specified in the following table:

Type of system	Report requirements[1]
System monitoring for chlorine or chloramines under the requirements of § 1103(C).	1. The number of samples taken during each month of the last quarter. 2. The monthly arithmetic average of all samples taken in each month for the last 12 months.

	3. The arithmetic average of the monthly averages for the last 12 months. 4. Whether, based on § 1104 (C)(1), the MRDL was violated.
System monitoring for chlorine dioxide under the requirements of § 1103(C).	1. The dates, results, and locations of samples taken during the last quarter. 2. Whether, based on § 1104 (C)(2), the MRDL was violated. 3. Whether the MRDL was exceeded in any two consecutive daily samples and whether the resulting violation was acute or nonacute.

[1] The Director may choose to perform calculations and determine whether the MRDL was exceeded, in lieu of having the system report that information.

D. Disinfection byproduct precursors and enhanced coagulation or enhanced softening. Systems must report the information specified in the following table:

Type of system	Report requirements[1]
System monitoring monthly or quarterly for TOC under the requirements of § 1103(D) and required to meet the softening requirements in § 1106(B)(2) or (3).	1. The number of paired (source water and treated water, prior to continuous enhanced coagulation or enhanced disinfection) samples taken during the last quarter. 2. The location, date, and result of each paired sample and associated alkalinity taken during the last quarter. 3. For each month in the reporting period that paired samples were taken, the arithmetic average of the percent reduction of TOC for each paired sample and the required TOC percent removal. 4. Calculations for determining compliance with the TOC percent removal requirements, as provided in § 1106(C)(1). 5. Whether the system is in compliance with the enhanced coagulation or enhanced softening percent removal requirements in § 1106(B) for the last four quarters.
System monitoring monthly or quarterly for TOC under the requirements of §1103(D) and meeting one or more of the alternative compliance criteria in §1106(A)(2) or (3).	1. The alternative compliance criterion that the system is using. 2. The number of paired samples taken during the last quarter. 3. The location, date, and result of each paired sample and associated alkalinity taken during the last quarter. 4. The running annual arithmetic average based on monthly averages (or quarterly samples) of source water TOC for systems meeting a criterion in § 1106(A)(2)(a) or © or of treated water TOC for systems meeting the criterion in §1106(A)(2)(b). 5. The running annual arithmetic average based on monthly averages (or quarterly samples) of source water SUVA for systems meeting the criterion in § 1106(A)(2)(e) or of treated water SUVA for systems meeting the criterion in §1106(A)(2)(f). 6. The running annual average of source water alkalinity for systems meeting the criterion in § 1106(A)(2)(c) and of treated water alkalinity for systems meeting the criterion in §1106(A)(3)(a). 7. The running annual average for both TTHM and HAA5 for systems meeting the criterion in § 1106(A)(2)(c) or (d). 8. The running annual average of the amount of magnesium hardness removal (as $CaCO_3$, in mg/L) for systems meeting the criterion in §

		1106(A)(3)(b).
	9.	Whether the system is in compliance with the particular alternative compliance criterion in § 1106(A)(2) or (3).

[1] The Director may choose to perform calculations and determine whether the treatment technique was met, in lieu of having the system report that information.

§ 1106 TREATMENT TECHNIQUE FOR CONTROL OF DISINFECTION BYPRODUCT (DBP) PRECURSORS

A. Applicability

1. Part VIII systems using conventional filtration treatment (as defined in § 104) must operate with enhanced coagulation or enhanced softening to achieve the TOC percent removal levels specified in subsection (B) of this section unless the system meets at least one of the alternative compliance criteria listed in subsection (A)(2) or (A)(3) of this section.

2. Alternative compliance criteria for enhanced coagulation and enhanced softening systems. Part VIII systems using conventional filtration treatment may use the alternative compliance criteria in subsections (A)(2)(a) through (f) of this section to comply with this section in lieu of complying with subsection (B) of this section. Systems must still comply with monitoring requirements in § 1103(D).

   a. The system's source water TOC level, measured according to Appendix E § 1101-E (D)(3), is less than 2.0 mg/L, calculated quarterly as a running annual average.

   b. The system's treated water TOC level, measured according to Appendix E § 1101-E (D)(3), is less than 2.0 mg/L, calculated quarterly as a running annual average.

   c. The system's source water TOC level, measured as required by Appendix E § 1101-E (D)(3), is less than 4.0 mg/L, calculated quarterly as a running annual average; the source water alkalinity, measured according to Appendix E § 1101-E (D)(1), is greater than 60 mg/L (as $CaCO_3$), calculated quarterly as a running annual average; and either the TTHM and HAA5 running annual averages are no greater than 0.040 mg/L and 0.030 mg/L, respectively; or prior to the effective date for compliance in § 1101(B), the system has made a clear and irrevocable financial commitment not later than the effective date for compliance in § 1101(B) to use of technologies that will limit the levels of TTHMs and HAA5 to no more than 0.040 mg/L and 0.030 mg/L, respectively. Systems must submit evidence of a clear and irrevocable financial commitment, in addition to a schedule containing milestones and periodic progress reports for installation and operation of appropriate technologies, to the Director for approval not later than the effective date for compliance in § 1101(B). These technologies must be installed and operating not later than June 30, 2005. Failure to install and operate these technologies by the date in the approved schedule will constitute a violation NNPDWR.

   d. The TTHM and HAA5 running annual averages are no greater than 0.040 mg/L and 0.030 mg/L, respectively, and the system uses only chlorine for primary disinfection and maintenance of a residual in the distribution system.

   e. The system's source water SUVA, prior to any treatment and measured monthly according to Appendix E § 1101-E (D)(4), is less than or equal to 2.0 L/mg-m, calculated quarterly as a running annual average.

   f. The system's finished water SUVA, measured monthly according to Appendix E § 1101-E (D)(4), is less than or equal to 2.0 L/mg-m, calculated quarterly as a running annual average.

3. Additional alternative compliance criteria for softening systems. Systems practicing enhanced softening that cannot achieve the TOC removals required by subsection (B)(2) of this section may use the alternative compliance criteria in subsections (A)(3)(a) and (b) of this section in lieu of complying with subsection (B) of this section. Systems must still comply with monitoring requirements in § 1103(D).

   a. Softening that results in lowering the treated water alkalinity to less than 60 mg/L (as $CaCO_3$), measured monthly according to Appendix E § 1101-E(D)(1) and calculated quarterly as a running annual average.

   b. Softening that results in removing at least 10 mg/L of magnesium hardness (as $CaCO_3$), measured monthly according to Appendix E-1103-E (D)(6) and calculated quarterly as an annual running average.

B. Enhanced coagulation and enhanced softening performance requirements.

1. Systems must achieve the percent reduction of TOC specified in subsection (B)(2) of this section between the source water and the combined filter effluent, unless the Director approves a system's request for alternate minimum TOC removal (Step 2) requirements under subsection (B)(3) of this section.

2. Required Step 1 TOC reductions, indicated in the following table, are based upon specified source water parameters measured in accordance with Appendix E § 1101-E (D). Systems practicing softening are required to meet the Step 1 TOC reductions in the far-right column (Source water alkalinity >120 mg/L) for the specified source water TOC:

Step 1 Required Removal of TOC by Enhanced Coagulation and Enhanced Softening for Part VIII General Requirements for Surface Water Treatment Systems Using Conventional Treatment [1,2]

Source-water TOC, mg/L	Source water alkalinity, mg/L as $CaCO_3$		
	0-60 (%)	≤60-120 (%)	>120[3] (%)
>2.0-4.0	35.0	25.0	15.0
>4.0-8.0	45.0	35.0	25.0
>8.0	50.0	40.0	30.0

[1] Systems meeting at least one of the conditions in subsection (A)(2)(a)-(f) of this section are not required to operate with enhanced coagulation.
[2] Softening systems meeting one of the alternative compliance criteria in subsection (A)(3) of this section are not required to operate with enhanced softening.
[3] Systems practicing softening must meet the TOC removal requirements in this column.

3. Part VIII conventional treatment systems that cannot achieve the Step 1 TOC removals required by subsection (B)(2) of this section due to water quality parameters or operational constraints must apply to the Director, within three months of failure to achieve the TOC removals required by subsection (B)(2) of this section, for approval of alternative minimum TOC (Step 2) removal requirements submitted by the system. If the Director approves the alternative minimum TOC removal (Step 2) requirements, the Director may make those requirements retroactive for the purposes of determining compliance. Until the Director approves the alternate minimum TOC removal (Step 2) requirements, the system must meet the Step 1 TOC removals contained in subsection (B)(2) of this section.

4. Alternate minimum TOC removal (Step 2) requirements. Applications made to the Director by enhanced coagulation systems for approval of alternative minimum TOC removal (Step 2) requirements under subsection (B)(3) of this section must include, as a minimum, results of bench- or pilot-scale testing conducted under subsection (B)(4)(a) of this section and used to determine the alternate enhanced coagulation level.

a. Alternate enhanced coagulation level is defined as coagulation at a coagulant dose and pH as determined by the method described in subsections (B)(4)(a) through (e) of this section such that an incremental addition of 10 mg/L of alum (as aluminum or equivalent amount of ferric salt) results in a TOC removal of <0.3 mg/L. The percent removal of TOC at this point on the "TOC removal versus coagulant dose" curve is then defined as the minimum TOC removal required for the system. Once approved by the Director, this minimum requirement supersedes the minimum TOC removal required by the table in subsection (B)(2) of this section. This requirement will be effective until such time as the Director approves a new value based on the results of a new bench- and pilot-scale test. Failure to achieve Director-set alternative minimum TOC removal levels is a violation of NNPDWR.

b. Bench- or pilot-scale testing of enhanced coagulation must be conducted by using representative water samples and adding 10 mg/L increments of alum (as aluminum or equivalent amounts of ferric salt) until the pH is reduced to a level less than or equal to the enhanced coagulation Step 2 target pH shown in the following table:

Enhanced Coagulation Step 2 target pH

Alkalinity (mg/L as $CaCO_3$)	Target pH
0-60	5.5
>60-120	6.3
>120-240	7.0
>240	7.5

c. For waters with alkalinities of less than 60 mg/L for which addition of small amounts of alum or equivalent addition of iron coagulant drives the pH below 5.5 before significant TOC removal occurs, the system must add necessary chemicals to maintain the pH between 5.3 and 5.7 in samples until the TOC removal of 0.3 mg/L per 10 mg/L alum added (as aluminum or equivalent addition of iron coagulant) is reached.

d. The system may operate at any coagulant dose or pH necessary (consistent with other NNPDWRs) to achieve the minimum TOC percent removal approved under subsection (B)(3) of this section.

e. If the TOC removal is consistently less than 0.3 mg/L of TOC per 10 mg/L of incremental alum dose at all dosages of alum (or equivalent addition of iron coagulant), the water is deemed to contain TOC not amenable to enhanced coagulation. The system may then apply to the Director for a waiver of enhanced coagulation requirements.

C. Compliance calculations.

1. Part VIII systems other than those identified in subsection (A)(2) or (A)(3) of this section must comply with requirements contained in subsection (B)(2) or (B)(3) of this section. Systems must calculate compliance quarterly, beginning after the system has collected 12 months of data, by determining an annual average using the following method:

a. Determine actual monthly TOC percent removal, equal to:

(1- (treated water TOC/source water TOC)) x 100

b. Determine the required monthly TOC percent removal (from either the table in subsection (B)(2) or (B)(3) of this section).

c. Divide the value in subsection (C)(1)(a) of this section by the value in subsection (C)(1)(b) of this section.

d. Add together the results of subsection (C)(1)(c) of this section for the last 12 months and divide by 12.

e. If the value calculated in subsection (C)(1)(d) of this section is less than 1.00, the system is not in compliance with the TOC percent removal requirements.

2. Systems may use the provisions in subsections (C)(2)(a) through (e) of this section in lieu of the calculations in subsection (C)(1)(a) through (e) of this section to determine compliance with TOC percent removal requirements.

a. In any month that the system's treated or source water TOC level, measured according to Appendix E § 1101-E (D)(3), is less than 2.0 mg/L, the system may assign a monthly value of 1.0 (in lieu of the value calculated in subsection (C)(1)(c) of this section) when calculating compliance under the provisions of subsection (C)(1) of this section.

b. In any month that a system practicing softening removes at least 10 mg/L of magnesium hardness (as $CaCO_3$), the system may assign a monthly value of 1.0 (in lieu of the value calculated in subsection (C)(1)(c) of this section) when calculating compliance under the provisions of subsection (C)(1) of this section.

c. In any month that the system's source water SUVA, prior to any treatment and measured according to Appendix E § 1101-E (D)(4), is ≤2.0 L/mg-m, the system may assign a monthly value of 1.0 (in lieu of the value calculated in subsection (C)(1)(c) of this section) when calculating compliance under the provisions of subsection (C)(1) of this section.

d. In any month that the system's finished water SUVA, measured according to Appendix E § 1101-E (D)(4), is ≤2.0 L/mg-m, the system may assign a monthly value of 1.0 (in lieu of the value calculated in subsection (C)(1)(c) of this section) when calculating compliance under the provisions of subsection (C)(1) of this section.

e. In any month that a system practicing enhanced softening lowers alkalinity below 60 mg/L (as $CaCO_3$), the system may assign a monthly value of 1.0 (in lieu of the value calculated in subsection (C)(1)(c) of this section) when calculating compliance under the provisions of subsection (C)(1) of this section.

3. Part VIII systems using conventional treatment may also comply with the requirements of

this section by meeting the criteria in subsection (A)(2) or (3) of this section.

D. Treatment technique requirements for DBP precursors. The Administrator identifies the following as treatment techniques to control the level of disinfection byproduct precursors in drinking water treatment and distribution systems: For Part VIII systems using conventional treatment, enhanced coagulation or enhanced softening.

Part XII
CONSUMER CONFIDENCE REPORTS

§ 1201 PURPOSE

This part establishes the minimum requirements for the content of annual reports, called "Consumer Confidence Reports" that Community Water Systems (CWSs) must deliver to their customers. These reports must contain information on the quality of the water delivered by the systems and characterize the risks (if any) from exposure to contaminants detected in the drinking water in an accurate and understandable manner. Appendix F provides suggested value conversions, regulated contaminants and language for preparing Consumer Confidence Reports. References in this part to section numbers are to the NNPDWR, unless otherwise indicated.

§ 1202 APPLICABILITY

A. Notwithstanding the provisions of §107, this part applies only to CWSs.

B. For the purposes of this part, customers are defined as billing units or service connection to which water is delivered by a community water system.

C. For the purposes of this part, detected means: At or above the levels prescribed by § 405 (C) for inorganic contaminants, at or above the levels prescribed by § 409 (F)for the contaminants listed in § 204 (A)(1), at or above the levels prescribed by § 410 (C)(2) for the contaminants listed in § 204 (A)(2), at or above the levels prescribed by Appendix E-1101-E (B)(2)(d) for the contaminants or contaminant groups listed in §207, and at or above the levels prescribed by § 411 (B) for radioactive contaminants.

§ 1203 EFFECTIVE DATES

A. The regulations in this part shall take effect upon approval by the Navajo Nation Resources Committee.

B. Each existing CWS must deliver its first report pursuant to these regulations by July 1, 2003, and subsequent reports by July 1 annually thereafter. The first report must contain data collected during or prior to calendar year 2003 as prescribed in § 1204(D)(3). Each report thereafter must contain data collected during or prior to the previous calendar year.

C. A new CWS must deliver its first report by July 1 of the year after its first full calendar year in operation and annually thereafter.

D. A CWS that sells water to another CWS must deliver the applicable information required in § 1204 to the consecutive system:

1. no later than April 1, 2003, and by April 1 annually thereafter; or

2. on a date mutually agreed upon by the seller and the purchaser, and specifically included in a contract between the parties.

§ 1204 CONTENTS OF THE REPORTS

A. Each CWS must provide to its customers an annual report that contains the information specified in this section and § 1205.

B. Information on the source of the water delivered.

1. Each report must identify the source(s) of the water delivered by the CWS by providing information on:

a. The type of the water source: e.g., surface water, ground water; and

b. The commonly used name (if any) and location of the body (or bodies) of water.

2. If a source water assessment has been completed, the report must notify consumers of the availability of this information and the means to obtain it. In addition, systems are encouraged to highlight in the report significant sources of contamination in the source water area if they have readily available information. Where a system has received a source water assessment from the PWSSP, the report must include a brief summary of the system's susceptibility to potential sources of contamination, using language provided by the PWSSP or written by the operator.

C. Definitions.

1. Each report must include the following definitions:

   a. Maximum Contaminant Level Goal or MCLG: The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.

   b. Maximum Contaminant Level or MCL: The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.

2. A report for a CWS operating under a variance or an exemption issued under §§ 601, 602 or 603 of the Navajo Nation Safe Drinking Water Act must include the following definition: Variances and Exemptions: PWSSP or EPA permission not to meet a MCL or a treatment technique under certain conditions.

3. A report that contains data on contaminants that EPA regulates using any of the following terms must include the applicable definitions:

   a. Treatment Technique: A required process intended to reduce the level of a contaminant in drinking water.

   b. Action Level: The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.

   c. Maximum residual disinfectant level goal or MRDLG: The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

   d. Maximum residual disinfectant level or MRDL: The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

D. Information on Detected Contaminants.

1. This subsection specifies the requirements for information to be included in each report for contaminants subject to mandatory monitoring (except Cryptosporidium). It applies to:

   a. Contaminants subject to a MCL, action level, maximum residual disinfectant level, or treatment technique (regulated contaminants).

2. The data relating to these contaminants must be displayed in one table or in several adjacent tables. Any additional monitoring results which a CWS chooses to include in its report must be displayed separately.

3. The data must be derived from data collected to comply with EPA and PWSSP monitoring and analytical requirements during calendar year 2002 for the first report and subsequent calendar years thereafter, except that:

   a. Where a system is allowed to monitor for regulated contaminants less often than once a year, the table(s) must include the date and results of the most recent sampling and the report must include a brief statement indicating that the data presented in the report are from the most recent testing done in accordance with the regulations. No data older than 5 years need be included.

4. For detected regulated contaminants (listed in Appendix F to these regulations), the table(s) must contain:

   a. The MCL for that contaminant expressed as a number equal to or greater than 1.0 (as provided in Appendix F to these regulations);

   b. The MCLG for that contaminant expressed in the same units as the MCL;

   c. If there is no MCL for a detected contaminant, the table must indicate that there is a treatment technique, or specify the action level, applicable to that contaminant, and the report must include the definitions for treatment technique and/or action level, as appropriate, specified in paragraph(C)(3) of this section;

   d. For contaminants subject to a MCL, except turbidity and total coliforms, the highest contaminant level used to determine compliance with a NNPDWR and the range of detected levels, as follows:

i. When compliance with the MCL is determined annually or less frequently: the highest detected level at any sampling point and the range of detected levels expressed in the same units as the MCL.

ii. When compliance with the MCL is determined by calculating a running annual average of all samples taken at a sampling point: the highest average of any of the sampling points and the range of all sampling points expressed in the same units as the MCL. For the MCLs for TTHM and HAA5 in §207(B)(2), systems must include the highest locational running annual average for TTHM and HAA5 and the range of individual sample results for all sampling points expressed in the same units as the MCL. If more than one location exceeds the TTHM or HAA5 MCL, the systems must include the locational running annual averages for all locations that exceed the MCL.

iii. When compliance with the MCL is determined on a system-wide basis by calculating a running annual average of all samples at all sampling points: the average and range of detection expressed in the same units as the MCL. The system is required to include individual sample results for the IDSE conducted under Part XXII of these regulations when determining the range of TTHM and HAA5 results to be reported in the annual consumer confidence report for the calendar year that the IDSE samples were taken.

Note to paragraph (D)(4)(d): When rounding of results to determine compliance with the MCL is allowed by the regulations, rounding should be done prior to multiplying the results by the factor listed in Appendix F of these regulations.

e. For turbidity.

i. When it is reported pursuant to § 206: the highest average monthly value.

ii. When it is reported pursuant to the requirements of § 803: the highest monthly value. The report should include an explanation of the reasons for measuring turbidity.

iii. When it is reported pursuant to § 805, § 1305 or §2106(B): the highest single measurement and the lowest monthly percentage of samples meeting the turbidity limits specified in § 805, or § 1305 or §2106(B) for the filtration technology being used. The report should include an explanation of the reasons for measuring turbidity.

f. For lead and copper: the 90^{th} percentile value of the most recent round of sampling and the number of sampling sites exceeding the action level.

g. For total coliform:

i. The highest monthly number of positive samples for systems collecting fewer than 40 samples per month; or

ii. The highest monthly percentage of positive samples for systems collecting at least 40 samples per month.

h. For fecal coliform: the total number of positive samples.

i. The likely source(s) of detected contaminants to the best of the operator's knowledge. Specific information regarding contaminants may be available in sanitary surveys and source water assessments, and should be used when available to the operator. If the operator lacks specific information on the likely source, the report must include one or more of the typical sources for that contaminant listed in Appendix F that is most applicable to the system.

5. If a CWS distributes water to its customers from multiple hydraulically independent distribution systems that are fed by different raw water sources, the table should contain a separate column for each service area and the report should identify each separate distribution system. Alternatively, systems could produce separate reports tailored to include data for each service area.

6. The table(s) must clearly identify any data indicating violations of MCLs, MRDLs, or treatment techniques and the report must contain a clear and readily understandable explanation of the violation including: the length of the violation, the potential adverse health effects, and actions taken by the system to address the violation. To describe the potential health effects, the system must use the relevant language of Appendix F.

7. For detected unregulated contaminants for which monitoring is required (except Cryptosporidium), the table(s) must contain the average and range at which the contaminant was detected. The report may include a brief explanation of the reasons for monitoring for unregulated contaminants.

E. Information on Cryptosporidium, radon, and other contaminants.

1. If the system has performed any monitoring for *Cryptosporidium*, including monitoring performed to satisfy the requirements of 40 CFR § 141.143, which indicates that *Cryptosporidium* may be present in the source water or the finished water, the report must include:

   a. A summary of the results of the monitoring; and

   b. An explanation of the significance of the results.

2. If the system has performed any monitoring for radon which indicates that radon may be present in the finished water, the report must include:

   a. The results of the monitoring; and

   b. An explanation of the significance of the results.

3. If the system has performed additional monitoring which indicates the presence of other contaminants in the finished water, NNEPA strongly encourages systems to report any results which may indicate a health concern. To determine if results may indicate a health concern, NNEPA recommends that systems find out if EPA or NNEPA has proposed a NPDWR or a NNPDWR, respectively, or issued a health advisory for that contaminant by calling the PWSSP at (928) 871-7755 and/or the EPA Safe Drinking Water hotline at (800) 426-4791. NNEPA considers detects above a proposed MCL or health advisory level to indicate possible health concerns. For such contaminants, NNEPA recommends that the report include:

   a. The results of the monitoring; and

   b. An explanation of the significance of the results noting the existence of a health advisory or a proposed regulation.

F. Compliance with NNPDWR. In addition to the requirements of paragraph (D)(6), the report must note any violation that occurred during the year covered by the report of a requirement listed below, and include a clear and readily understandable explanation of the violation, any potential adverse health effects, and the steps the system has taken to correct the violation.

1. Monitoring and reporting of compliance data;

2. Filtration and disinfection prescribed by Part VIII-General Requirements for Surface Water Treatment. For systems which have failed to install adequate filtration or disinfection equipment or processes, or have had a failure of such equipment or processes which constitutes a violation, the report must include the following language as part of the explanation of potential adverse health effects: "Inadequately treated water may contain disease-causing organisms. These organisms include bacteria, viruses, and parasites which can cause symptoms such as nausea, cramps, diarrhea, and associated headaches."

3. Lead and copper control requirements prescribed by Part VII (Lead and Copper). For systems that fail to take one or more actions prescribed by §§ 704(B), 705, 706, 707, or 708, the report must include the applicable language of Appendix F for lead, copper, or both.

4. Treatment techniques for Acrylamide and Epichlorohydrin prescribed by Part X-Treatment Techniques. For systems that violate the requirements of Part X, the report must include the relevant language from Appendix F.

5. Recordkeeping of compliance data.

6. Violation of the terms of a variance, an exemption, or an administrative or judicial order.

G. Variances and Exemptions. If a system is operating under the terms of a variance or an exemption issued under §§ 601, 602 or 603 of Navajo Nation Safe Drinking Water Act, the report must contain:

1. An explanation of the reasons for the variance or exemption;

2. The date on which the variance or exemption was issued;

3. A brief status report on the steps the system is taking to install treatment, find alternative sources of water, or otherwise comply with the terms and schedules of the variance or exemption; and

4. A notice of any opportunity for public input in the review, or renewal, of the variance or exemption.

H. Additional information

1. The report must contain a brief explanation regarding contaminants that may reasonably be expected to be found in drinking water, including bottled water. This explanation may include the language of paragraphs (H)(1)(a) through © or systems may use their own comparable language. The report also must include the language of paragraph (H)(1)(d) of this section.

   a. The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally-occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity.

   b. Contaminants that may be present in source water include:

      I. Microbial contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.

      ii. Inorganic contaminants, such as salts and metals, which can be naturally-occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.

      iii. Pesticides and herbicides, which may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses.

      iv. Organic chemical contaminants, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff, and septic systems.

      v. Radioactive contaminants, which can be naturally-occurring or be the result of oil and gas production and mining activities.

   c. In order to ensure that tap water is safe to drink, NNEPA prescribes regulations which limit the amount of certain contaminants in water provided by public water systems. Food and Drug Administration (FDA) regulations establish limits for contaminants in bottled water which must provide the same protection for public health.

   d. Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the PWSSP at (928) 871-7755.

2. The report must include the telephone number of the owner, operator, or designee of the CWS as a source of additional information concerning the report.

3. The report must contain information in the Navajo language regarding the importance of the report or contain a telephone number or address and a statement in Navajo that residents may contact the system at that number or address to obtain a translated copy of the report or assistance with a Navajo interpretation of the report.

4. The report must include information (e.g., time and place of regularly scheduled board or chapter meetings) about opportunities for public participation in decisions that may affect the quality of the water.

5. The systems may include such additional information as they deem necessary for public education consistent with, and not detracting from, the purpose of the report.

6. Systems required to comply with Part XXV.

a. Any groundwater system that receives notice from the Director of a significant deficiency or notice from a laboratory of a fecal indicator-positive groundwater source sample that is not invalidated by the Director under §2503(D) must inform its customers of any significant deficiency that is uncorrected at the time of the next report or of any fecal indicator-positive groundwater source sample in the next report. The system must continue to inform the public annually until the Director determines that particular significant deficiency is corrected or the fecal contamination in the groundwater source is addressed under §2504(A). Each report must include the following elements.

1. The nature of the particular significant deficiency or the source of the fecal contamination (if the source is known) and the date the significant deficiency was identified by the Director of the dates of the fecal indicator-positive groundwater source samples.

2. If the fecal contamination in the groundwater source has been addressed under §2504(A) and the date of such action;

3. For each significant deficiency or fecal contamination in the groundwater source that has not been addressed under §2504(A), the Director-approved plan and schedule for correction, including interim measures, progress to date and any interim measures completed; and

4. If the system receives notice of a fecal indicator-positive groundwater source sample that is not invalidated by the Director under §2503©, the potential health effects using the health effects language of Appendix F.

b. If directed by the Director, a system with significant deficiencies that have been corrected before the next report is issued must inform its customers of the significant deficiency, how the deficiency was corrected and the data of correction under §(H)(6)(A) of this section.

§ 1205 REQUIRED ADDITIONAL HEALTH INFORMATION

A. All reports must prominently display the following language:

"Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the Safe Drinking Water Hotline (800-426-4791)."

B. Ending in the report due by July 1, 2001, a system which detects arsenic at levels above 0.025 mg/L, but below the 0.05 mg/L, and beginning in the report due by July 1, 2002, a system that detects arsenic above 0.005 mg/L and up to and including 0.010 mg/L:

1. Must include in its report a short informational statement about arsenic, using language such as: "While your drinking water meets EPA's standard for arsenic, it does contain low levels of arsenic. EPA's standard balances the current understanding of arsenic's possible health effects against the costs of removing arsenic from drinking water. EPA continues to research the health effects of low levels of arsenic, which is a mineral known to cause cancer in humans at high concentrations and is linked to other health effects such as skin damage and circulatory problems."

2. May write its own educational statement, but only in consultation with the Director.

C. A system that detects nitrate at levels above 5 mg/L, but below the MCL:

1. Must include a short informational statement about the impacts of nitrate on children, using language such as: "Nitrate in drinking water at levels above 10 ppm is a health risk for infants of less than six months of age. High nitrate levels in drinking water can cause blue baby syndrome. Nitrate levels may rise quickly for short periods of time because of rainfall or agricultural activity. If you are caring for an infant you should ask advice from your health care provider."

2. May write its own educational statement, but only in consultation with the Director.

D. Systems that detect lead above the action level in more than 5%, and up to and including 10%, of homes sampled:

1. Must include a short informational statement about the special impact of lead on children,

using language such as: "Infants and young children are typically more vulnerable to lead in drinking water than the general population. It is possible that lead levels at your home may be higher than at other homes in the community as a result of materials used in your home's plumbing. If you are concerned about elevated lead levels in your home's water, flush your tap for 30 seconds to 2 minutes before using tap water. Additional information is available from the Safe Drinking Water Hotline (800-426-4791) or the PWSSP at (928) 871-7755."

2. May write its own educational statement, but only in consultation with the Director.

E. CWSs that detect TTHM above 0.080 mg/L, but below the MCL in § 210, as an annual average, monitored and calculated under the provisions of § 413, must include health effects language for TTHMs prescribed by Appendix F.

F. Beginning in the report due by July 1, 2002 and ending January 22, 2006, a CWS that detects arsenic above 0.010 mg/L and up to and including 0.05

mg/L must include the arsenic health effects language prescribed by Appendix F.

§ 1206 REPORT DELIVERY AND RECORDKEEPING

A. Except as provided in subsection (G) of this section, each CWS must mail or otherwise directly deliver one copy of the report to each customer.

B. The system must make a good faith effort to reach consumers who do not get water bills, using means recommended by the Director. NNEPA expects that an adequate good faith effort will be tailored to the consumers who are served by the system but are not bill-paying customers, such as renters or workers. A good faith effort to reach consumers would include a mix of methods appropriate to the particular system, such as: Posting the reports on the Internet; mailing to postal patrons; advertising the availability of the report in the news media; publication in a local newspaper; posting in public places such as cafeterias or lunch rooms of public buildings; delivery of multiple copies for distribution by single-biller customers such as apartment buildings or large private employers; delivery to community, including chapter, organizations.

C. No later than the date the system is required to distribute the report to its customers, each CWS must mail a copy of the report to the Director, followed within 3 months by a certification that the report has been distributed to customers, and that the information is correct and consistent with the compliance monitoring data previously submitted to the Director.

D. No later than the date the system is required to distribute the report to its customers, each CWS must deliver the report to any other agency or clearinghouse identified by the Director.

E. Each CWS must make its reports available to the public upon request.

F. The Director may waive the requirement of subsection (A) of this section for CWSs serving fewer than 10,000 persons. Written requests to the Director must be made and the determination will be sent to the CWS owner/operator.

1. Such systems must:

a. Publish the reports in one or more local newspapers serving the area in which the system is located;

b. Inform the customers that the reports will not be mailed, either in the newspapers in which the reports are published or by other means approved by the Director; and

c. Make the reports available to the public upon request.

2. Systems serving 500 or fewer persons may forego the requirements of paragraphs (F)(1)(a) and (b) of this section if they provide notice at least once per year to their customers by mail, door-to-door delivery or by posting in an appropriate location that the report is available upon request.

G. Any system subject to this part must retain copies of its Consumer Confidence Report for no fewer than 3 years.

Part XIII
ENHANCED SURFACE WATER TREATMENT

§ 1301 APPLICABILITY

These regulations establish requirements for filtration and disinfection that are in addition to criteria under which filtration and disinfection are required under Part VIII - General Requirements for Surface Water Treatment. The requirements of this part are applicable to Part VIII systems serving at least 10,000 people, beginning January 01, 2002 unless otherwise specified in this part.

§ 1302 GENERAL REQUIREMENTS

A. The regulations in this part establish or extend treatment technique requirements in lieu of maximum contaminant levels for the following contaminants: *Giardia lamblia*, viruses, heterotrophic plate count bacteria, *Legionella, Cryptosporidium*, and turbidity.

B. Each Part VIII systems serving at least 10,000 people must provide treatment of its source water that complies with these treatment technique requirements and is in addition to those requirements identified in §§ 801 and 802.

C. The treatment technique requirements consist of installing and properly operating water treatment processes which reliably achieve:

1. At least 99 percent (2-log) removal of *Cryptosporidium* between a point where the raw water is not subject to re-contamination by surface water runoff and a point downstream before or at the first customer for filtered water systems, or *Cryptosporidium* control under the watershed control plan for unfiltered water systems.

2. Compliance with the profiling and benchmark requirements under the provisions of § 1304.

D. A public water system subject to the requirements of this part is considered to be in compliance with the requirements of paragraphs (A)-(C) of this section if:

1. It meets the requirements for avoiding filtration in §§ 803 and § 1303 and the disinfection requirements in §§ 804 and 1304; or

2. It meets the applicable filtration requirements in either § 805 or § 1305 and the disinfection requirements in §§ 804 and 1304.

E. Systems will not be permitted to begin construction of uncovered finished water storage facilities. The provisions for the review of the design and construction of public water systems, including the final inspection prior to operation, are addressed in § 1500 of these regulations.

F. Part VIII systems that did not conduct optional monitoring under § 1304 because they served fewer than 10,000 persons when such monitoring was required, but serve more than 10,000 persons prior to January 14, 2005 must comply with §§ 1301, 1302, 1303, 1305, 1306, and 1307. These systems must also consult with the Director to establish a disinfection benchmark. A public water system that decides to make a significant change to its disinfection practice, as described in § 1304 (C)(1)(a) through (d) must consult with the Director prior to making such change.

§ 1303 CRITERIA FOR AVOIDING FILTRATION

In addition to the requirements of § 803, a public water system subject to the requirements of this part that does not provide filtration must meet all of the conditions of paragraphs (A) and (B) of this section.

A. Site-specific conditions. In addition to site-specific conditions in § 803(B), systems must maintain the watershed control program under § 803(B)(2) to minimize the potential for contamination by *Cryptosporidium oocysts* in the source water. The watershed control program must, for *Cryptosporidium:*

1. Identify watershed characteristics and activities which may have an adverse effect on source water quality; and

2. Monitor the occurrence of activities which may have an adverse effect on source water quality.

B. During the onsite inspection conducted under the provisions of § 803(B)(3), the Director must determine whether the watershed control program established under § 803(B)(2) is adequate to limit potential contamination by *Cryptosporidium oocysts*. The adequacy of the program must be

based on the comprehensiveness of the watershed review; the effectiveness of the water system's program to monitor and control detrimental activities occurring in the watershed; and the extent to which the water system has maximized land ownership and/or controlled land use within the watershed.

§ 1304 DISINFECTION PROFILING AND BENCHMARKING

A. Determination of systems required to profile. A public water system subject to the requirements of this part must determine its TTHM annual average using the procedure in subsection (A)(1) of this section and its HAA5 annual average using the procedure in subsection (A)(2) of this section. The annual average is the arithmetic average of the quarterly averages of four consecutive quarters of monitoring.

1. The TTHM annual average must be the annual average during the same period as is used for the HAA5 annual average.

   a. Those water systems that collected data under the provisions of the Information Collection Rule must use the results of the samples collected during the last four quarters of required monitoring under 40 CFR § 141.142.

   b. Those systems that use "grandfathered" HAA5 occurrence data that meet the provisions of subsection (A)(2)(b) of this section must use TTHM data collected at the same time under the provisions of §§ 210 and 413.

   c. Those systems that use HAA5 occurrence data that meet the provisions of subsection (A)(2)(c)(i) of this section must use TTHM data collected at the same time under the provisions of §§ 210 and 413.

2. The HAA5 annual average must be the annual average during the same period as is used for the TTHM annual average.

   a. Those systems that collected data under the provisions of the Information Collection Rule must use the results of the samples collected during the last four quarters of required monitoring under 40 CFR § 141.142.

   b. Those systems that have collected four quarters of HAA5 occurrence data that meets the routine monitoring sample number and location requirements for TTHM in §§ 210 and 413 and handling and analytical method requirements of 40 CFR § 141.142(b)(1) may use those data to determine whether the requirements of this section apply.

   c. Those water systems that have not collected four quarters of HAA5 occurrence data that meets the provisions of either subsection (A)(2)(a) or (b) of this section must either:

      i. Conduct monitoring for HAA5 that meets the routine monitoring sample number and location requirements for TTHM in §§ 210 and 413 and handling and analytical method requirements of 40 CFR § 141.142(b)(1) to determine the HAA5 annual average and whether the requirements of subsection (B) of this section apply. This monitoring must be completed so that the applicability determination can be made; or

      ii. Comply with all other provisions of this section as if the HAA5 monitoring had been conducted and the results required compliance with subsection (B) of this section.

3. The system may request that the Director approve a more representative annual data set than the data set determined under subsection (A)(1) or (2) of this section for the purpose of determining applicability of the requirements of this section.

4. The Director may require that a system use a more representative annual data set than the data set determined under subsection (A)(1) or (2) of this section for the purpose of determining applicability of the requirements of this section.

5. The system must submit data to the Director on the schedule in subsections (A)(5)(a) through (e) of this section.

   a. Those systems that collected TTHM and HAA5 data under the provisions of the Information Collection Rule, as required by subsections (A)(1)(a) and (A)(2)(a) of this section, must submit the results of the samples collected during the last 12 months of required monitoring under 40 CFR § 141.142.

   b. Those systems that have collected four consecutive quarters of HAA5 occurrence data that meets the routine monitoring sample number and location for TTHM in §§ 210 and

413 and handling and analytical method requirements of 40 CFR § 141.142(b)(1), as allowed by subsections (A)(1)(b) and (A)(2)(b) of this section, must submit those data to the Director. Until the Director has approved the data, the water system must conduct monitoring for HAA5 using the monitoring requirements specified under subsection (A)(2)(c) of this section.

c. Those systems that conduct monitoring for HAA5 using the monitoring requirements specified by subsections (A)(1)(c) and (A)(2)(c)(i) of this section, must submit TTHM and HAA5 data not later than March 31, 2000.

d. Those systems that elect to comply with all other provisions of this section as if the HAA5 monitoring had been conducted and the results required compliance with this section, as allowed under subsections (A)(2)(c)(ii) of this section, must notify the Director in writing of their election.

e. If the system elects to request that the Director approve a more representative annual data set than the data set determined under subsection (A)(2)(a) of this section, the water system must submit this request in writing.

6. Any system having either a TTHM annual average ≥0.064 mg/L or an HAA5 annual average ≥0.048 mg/L during the period identified in subsections (A)(1) and (2) of this section must comply with subsection (B) of this section.

B. Disinfection profiling.

1. Any system that meets the criteria in subsection (A)(6) of this section must develop a disinfection profile of its disinfection practice for a period of up to three years.

2. The system must monitor daily for a period of 12 consecutive calendar months to determine the total logs of inactivation for each day of operation, based on the $CT_{99.9}$ values in Appendix D - Tables 800-D-4 to 800-D-11, as appropriate, through the entire treatment plant. This water system must begin this monitoring not later than April 01, 2000, pursuant to 40 CFR §141.172(b)(2). As a minimum, the system with a single point of disinfectant application prior to entrance to the distribution system must conduct the monitoring in subsections (B)(2)(a) through (d) of this section. A system with more than one point of disinfectant application must conduct the monitoring in subsections (B)(2)(a) through (d) of this section for each disinfection segment. The system must monitor the parameters necessary to determine the total inactivation ratio, using analytical methods in Appendix D § 801-D(A), as follows:

a. The temperature of the disinfected water must be measured once per day at each residual disinfectant concentration sampling point during peak hourly flow.

b. If the system uses chlorine, the pH of the disinfected water must be measured once per day at each chlorine residual disinfectant concentration sampling point during peak hourly flow.

c. The disinfectant contact time(s) ("T") must be determined for each day during peak hourly flow.

d. The residual disinfectant concentration(s) ("C") of the water before or at the first customer and prior to each additional point of disinfection must be measured each day during peak hourly flow.

3. In lieu of the monitoring conducted under the provisions of subsection (B)(2) of this section to develop the disinfection profile, the system may elect to meet the requirements of subsection (B)(3)(a) of this section. In addition to the monitoring conducted under the provisions of subsection (B)(2) of this section to develop the disinfection profile, the water system may elect to meet the requirements of subsection (B)(3)(b) of this section.

a. A system that has three years of existing operational data may submit those data, a profile generated using those data, and a request that the Director approve use of those data in lieu of monitoring under the provisions of subsection (B)(2) of this section not later than March 31, 2000. The Director must determine whether these operational data are substantially equivalent to data collected under the provisions of subsection (B)(2) of this section. These data must also be representative of *Giardia lamblia* inactivation through the entire treatment plant and not just of certain treatment segments. Until the Director approves this request, the water system is required to conduct monitoring under the provisions of subsection (B)(2) of this section.

b. In addition to the disinfection profile generated under subsection (B)(2) of this

section, a PWS that has existing operational data may use those data to develop a disinfection profile for additional years. Such systems may use these additional yearly disinfection profiles to develop a benchmark under the provisions of subsection (C) of this section. The Director must determine whether these operational data are substantially equivalent to data collected under the provisions of subsection (B)(2) of this section. These data must also be representative of inactivation through the entire treatment plant and not just of certain treatment segments.

4. The system must calculate the total inactivation ratio as follows:

   a. If the system uses only one point of disinfectant application, the system may determine the total inactivation ratio for the disinfection segment based on either of the methods in subsection (B)(4)(a)(i) or (B)(4)(a)(ii) of this section.

      i. Determine one inactivation ratio ($CTcalc/CT_{99.9}$) before or at the first customer during peak hourly flow.

      ii. Determine successive $CTcalc/CT_{99.9}$ values, representing sequential inactivation ratios, between the point of disinfectant application and a point before or at the first customer during peak hourly flow. Under this alternative, the water system must calculate the total inactivation ratio by determining ($CTcalc/CT_{99.9}$) for each sequence and then adding the ($CTcalc/CT_{99.9}$) values together to determine (Σ ($CTcalc/CT_{99.9}$).

   b. If the system uses more than one point of disinfectant application before the first customer, the system must determine the CT value of each disinfection segment immediately prior to the next point of disinfectant application, or for the final segment, before or at the first customer, during peak hourly flow. The ($CTcalc/CT_{99.9}$) value of each segment and ($\Sigma(CTcalc/CT_{99.9})$) must be calculated using the method in subsection (B)(4)(a) of this section.

   c. The system must determine the total logs of inactivation by multiplying the value calculated in subsection (B)(4)(a) or (b) of this section by 3.0.

5. A system that uses either chloramines or ozone for primary disinfection must also calculate the logs of inactivation for viruses using a method approved by the Director.

6. The system must retain disinfection profile data in graphic form, as a spreadsheet, or in some other format acceptable to the Director for review as part of sanitary surveys conducted by the Director.

C. Disinfection benchmarking.

1. Any system required to develop a disinfection profile under the provisions of subsections (A) and (B) of this section and that decides to make a significant change to its disinfection practice must consult with the Director prior to making such change. Significant changes to disinfection practice are:

   a. Changes to the point of disinfection;

   b. Changes to the disinfectant(s) used in the treatment plant;

   c. Changes to the disinfection process; and

   d. Any other modification identified by the Director.

2. Any system that is modifying its disinfection practice must calculate its disinfection benchmark using the procedure specified in subsections (C)(2)(a) through (b) of this section.

   a. For each year of profiling data collected and calculated under subsection (B) of this section, the system must determine the lowest average monthly *Giardia lamblia* inactivation in each year of profiling data. The system must determine the average *Giardia lamblia* inactivation for each calendar month for each year of profiling data by dividing the sum of daily *Giardia lamblia* of inactivation by the number of values calculated for that month.

   b. The disinfection benchmark is the lowest monthly average value (for water systems with one year of profiling data) or average of lowest monthly average values (for systems with more than one year of profiling data) of the monthly logs of *Giardia lamblia* inactivation in each year of profiling data.

3. A system that uses either chloramines or ozone for primary disinfection must also calculate the disinfection benchmark for viruses using a method approved by the Director.

4. The system must submit information in subsections (C)(4)(a) through (c) of this section to the Director as part of its consultation process.

   a. A description of the proposed change;

   b. The disinfection profile for *Giardia lamblia* (and, if necessary, viruses) under subsection (B) of this section and benchmark as required by subsection (C)(2) of this section; and

   c. An analysis of how the proposed change will affect the current levels of disinfection.

§ 1305 FILTRATION

A public water system subject to the requirements of this part that does not meet all of the criteria in this part and Part VIII for avoiding filtration must provide treatment consisting of both disinfection, as specified in § 804(B), and filtration treatment which complies with the requirements of subsection (A) or (B) of this section or § 805 (B) or (C) by December 31, 2001.

A. Conventional filtration treatment or direct filtration.

1. For systems using conventional filtration or direct filtration, the turbidity level of representative samples of a system's filtered water must be less than or equal to 0.3 NTU in at least 95 percent of the measurements taken each month, measured as specified in Appendix D § 801-D(A) and (C).

2. The turbidity level of representative samples of a system's filtered water must at no time exceed 1 NTU, measured as specified in Appendix D §801-D (A) and (C).

3. A system that uses lime softening may acidify representative samples prior to analysis using a protocol approved by the Director.

B. Filtration technologies other than conventional filtration treatment, direct filtration, slow sand filtration, or diatomaceous earth filtration. A system may use a filtration technology not listed in subsection (A) of this section or in § 805(B) or (C) if it demonstrates to the Director, using pilot plant studies or other means, that the alternative filtration technology, in combination with disinfection treatment that meets the requirements of § 804(B), consistently achieves 99.9 percent removal and/or inactivation of *Giardia lamblia* cysts and 99.99 percent removal and/or inactivation of viruses, and 99 percent removal of *Cryptosporidium oocysts*, and the Director approves the use of the filtration technology. For each approval, the Director will set turbidity performance requirements that the system must meet at least 95 percent of the time and that the system may not exceed at any time at a level that consistently achieves 99.9 percent removal and/or inactivation of *Giardia lamblia* cysts, 99.99 percent removal and/or inactivation of viruses, and 99 percent removal of *Cryptosporidium oocysts*.

§ 1306 FILTRATION SAMPLING REQUIREMENTS

A. Monitoring requirements for systems using filtration treatment. In addition to monitoring required by Appendix D, a system subject to the requirements of this part that provides conventional filtration treatment or direct filtration must conduct continuous monitoring of turbidity for each individual filter using an approved method in Appendix D §801-D (A) and must calibrate turbidimeters using the procedure specified by the manufacturer. Systems must record the results of individual filter monitoring every 15 minutes.

B. If there is a failure in the continuous turbidity monitoring equipment, the system must conduct grab sampling every four hours in lieu of continuous monitoring, but for no more than five working days following the failure of the equipment.

§ 1307 REPORTING AND RECORDKEEPING REQUIREMENTS

In addition to the reporting and recordkeeping requirements in § 806, a system subject to the requirements of this part that provides conventional filtration treatment or direct filtration must report monthly to the Director the information specified in subsections (A) and (B) of this section beginning the first of the month following the month that these regulations become effective. In addition to the reporting and recordkeeping requirements in § 806, a water system subject to the requirements of this part that provides filtration approved under § 1305(B) must report monthly to the Director the information specified in subsection (A) of this section beginning the first of the month following the month that these regulations become effective. The reporting in subsection (A) of this section is in lieu of the reporting specified in § 806(B)(1).

A. Turbidity measurements as required by § 1305 must be reported within 10 days after the end of each month that the system serves water to the public. Information that must be reported includes:

1. The total number of filtered water turbidity measurements taken during the month.

2. The number and percentage of filtered water turbidity measurements taken during the month which are less than or equal to the turbidity limits specified in § 1305(A) or (B).

3. The date and value of any turbidity measurements taken during the month which exceed 1 NTU for systems using conventional filtration treatment or direct filtration, or which exceed the maximum level set by the Director under § 1305(B).

B. Systems must maintain the results of individual filter monitoring taken under § 1306 for at least three years. Water systems must report that they have conducted individual filter turbidity monitoring under § 1306 within 10 days after the end of each month the system serves water to the public. Systems must report individual filter turbidity measurement results taken under § 1306 within 10 days after the end of each month the system serves water to the public only if measurements demonstrate one or more of the conditions in subsections (B)(1) through (4) of this section. Systems that use lime softening may apply to the Director for alternative exceedance levels for the levels specified in subsections (B)(1) through (4) of this section if they can demonstrate that higher turbidity levels in individual filters are due to lime carryover only and not due to degraded filter performance.

1. For any individual filter that has a measured turbidity level of greater than 1.0 NTU in two consecutive measurements taken 15 minutes apart, the system must report the filter number, the turbidity measurement, and the date(s) on which the exceedance occurred. In addition, the system must either produce a filter profile for the filter within 7 days of the exceedance (if the system is not able to identify an obvious reason for the abnormal filter performance) and report that the profile has been produced or report the obvious reason for the exceedance.

2. For any individual filter that has a measured turbidity level of greater than 0.5 NTU in two consecutive measurements taken 15 minutes apart at the end of the first four hours of continuous filter operation after the filter has been backwashed or otherwise taken offline, the system must report the filter number, the turbidity, and the date(s) on which the exceedance occurred. In addition, the system must either produce a filter profile for the filter within 7 days of the exceedance (if the system is not able to identify an obvious reason for the abnormal filter performance) and report that the profile has been produced or report the obvious reason for the exceedance.

3. For any individual filter that has a measured turbidity level of greater than 1.0 NTU in two consecutive measurements taken 15 minutes apart at any time in each of three consecutive months, the system must report the filter number, the turbidity measurement, and the date(s) on which the exceedance occurred. In addition, the system must conduct a self-assessment of the filter within 14 days of the exceedance and report that the self-assessment was conducted. The self assessment must consist of at least the following components: assessment of filter performance; development of a filter profile; identification and prioritization of factors limiting filter performance; assessment of the applicability of corrections; and preparation of a filter self-assessment report.

4. For any individual filter that has a measured turbidity level of greater than 2.0 NTU in two consecutive measurements taken 15 minutes apart at any time in each of two consecutive months, the system must report the filter number, the turbidity measurement, and the date(s) on which the exceedance occurred. In addition, the system must arrange for the conduct of a comprehensive performance evaluation by the Director or a third party approved by the Director no later than 30 days following the exceedance and have the evaluation completed and submitted to the Director no later than 90 days following the exceedance.

C. Additional Reporting Requirements.

1. If at any time the turbidity exceeds 1 NTU in representative samples of filtered water in a system using conventional filtration treatment or direct filtration, the system must inform the Director as soon as possible, but no later than the end of the next business day.

2. If at any time the turbidity in representative samples of filtered water exceeds the maximum level set by the Director under § 1305 (B) for filtration technologies other than conventional filtration treatment, direct filtration, slow sand filtration, or diatomaceous earth filtration, the system must inform the Director as soon as possible, but no later than the end of the next business day.

PART XIV
PUBLIC WATER SYSTEM OPERATOR CERTIFICATION

§ 1401 PURPOSE

All public water system operators shall be certified by the Director pursuant to § 2539 of the Navajo Nation Safe Drinking Water Act (NNSDWA). Public water system owners shall ensure that their systems are supervised by certified operators, pursuant to these regulations. Possessing and maintaining operator certification protects the public health by promoting the provision of safe drinking water and improving the operation and maintenance of public water systems.

§ 1402 OPERATOR CERTIFICATION

A. Owners of all public water systems must place the direct supervision of their public water system, including each treatment plant and/or distribution system that comprises that public water system, under the responsible charge of an operator(s) holding a valid certification at or above the level required for the public water system, as provided in § 1404.

B. Operator(s) in responsible charge or equivalent must hold, at a minimum, a valid certification at or above the level required for their public water system, including each treatment plant and distribution system, as provided in § 1404.

C. All operating personnel making process control/system integrity decisions about water quality or quantity that effect public health must be certified.

D. Owners shall require that a designated certified operator be available for each operating shift.

§ 1403 GENERAL REQUIREMENTS

A. The owner of a public water system shall ensure that the person in direct responsible charge of the system is a certified operator and is certified at or above the level of the public water system.

1. A person in charge of a public water system, in the absence of the principal certified operator, shall be certified at a level no lower than one level below the level of the public water system.

2. No person shall make a decision about process control or system integrity regarding water quality or water quantity that affects public health, unless that person is a certified operator.

3. If a certified operator is in direct responsible charge of more than one public water system, the certified operator shall be certified at or above the level of the public water system with the highest level.

B. The public water system owner shall notify the Director in writing of the name of the current certified operator within 30 days of the effective date of these regulations and shall notify the Director of the name of any person replacing the certified operator within 10 business days of the change in operators. The owner shall notify the Director in writing within 10 business days of the date a public water system ceases operation.

C. There shall be four levels of public water systems, with Level 4 being the classification for the most complex. The Director shall classify each system pursuant to the criteria listed in § 1404, and may increase the classification of a public water system to a higher level only for the following reasons:

1. The public water system has special design feature characteristics that make it more difficult to operate than usual;

2. The water is unusually difficult to treat; or

3. The public water system poses potential risk to public health.

The Director shall notify the owner in writing of any change in classification. The owner may respond to any change in classification within 30 days of notification, and the Director will consider and respond to such comments before making a final decision as to classification. For a multi-facility, each component system shall be classified according to complexity and the total population or population equivalent served.

D. A certified operator may operate any water system of the same level for which the operator is certified or of any lower level.

E. NNEPA will consider that a system has an appropriately certified operator when the operator:

1. holds a valid certification equal to or greater than that required for the classification of the treatment facility and/or distribution system, as specified in these regulations;

2. demonstrates competency through knowledge, skills, and abilities to operate the system in compliance with the NNPDWR; and

3. is on-site, or able to be contacted as needed in order to initiate any necessary action in a timely manner.

§ 1404 CLASSIFICATION OF PUBLIC WATER SYSTEMS

A. Public water systems are classified by type and then by level according to each system characteristic, as follows:

1. Water Distribution System:

Level	Population/System Characteristics
Level 1	Population <3,300, Groundwater Disinfection by hypochlorite only
Level 2	3,301 - 10,000 population served, or Gaseous and other Chlorine Disinfectant, or 5 or more Pressure Zones, or Recycled Water Distribution, or System is Blending Sources to meet MCL
Level 3	10,001 - 25,000 population served
Level 4	≥25,001 population served

2. Water Treatment Plant:

Level	Points
Level 1	1-30
Level 2	31-55
Level 3	56-75
Level 4	>76

B. The points assigned for each system characteristic are as follows:

Water Treatment Plant

SYSTEM CHARACTERISTICS	**POINTS**
Population	1 per 1,000
Maximum Design Capacity	1 per 0.5 MGD up to 10
Groundwater Source without coliform (total, fecal or e. *coli*) presence	2
Groundwater Source with coliform (total, fecal or e. coli) presence	5
GWUDI Source	8
Surface Source	10
AVERAGE RAW WATER QUALITY VARIATION:	
Little or no variation - only treatment is disinfection	0

Minor variation - eg. "High quality" surface source appropriate for slow sand filtration	2
Requires moderate variation in chemical feed, dosage changes made; monthly (3pts), weekly (4pts), or daily (5pts)	3-5
Variation significant enough to require pronounced and/or very frequent changes (more than daily)	6
Severe variation - source subject to non-point discharges, agricultural/urban storm runoff, flooding	7
Raw water quality subject to agricultural or municipal waste point discharges	8
Raw water quality subject to recreational use (boating fishing, etc.)	6
Raw water quality subject to periodic serious industrial waste pollution	10
Taste and/or odor for which treatment process adjustment are routinely made	2
Color levels >NNSDWR	3
Iron and/or manganese levels > NNSDWR	2
Algal growths for which treatment process adjustments are routinely made	3
CHEMICAL TREATMENT ADDITION PROCESS:	
Fluoridation	5
DISINFECTION	
If a disinfectant/oxidizer is generated on-site, add 1 point to the point value shown	
Hypochlorite Liquid or Solid	5
Chlorine Gas	8
Chlorine Dioxide	10
Chloramine	10
Ozone	10
UV Irradiation	2
Potassium permanganate	4
pH Adjustment (Calcium carbonate, carbon dioxide, hydrochloric acid, calcium oxide, calcium hydroxide, sodium hydroxide, sulfuric acid, other)	4
Stability or Corrosion Control (calcium oxide, calcium hydroxide, sodium carbonate, sodium hexametaphosphate, other)	10
COAGULATION AND FLOCCULATION PROCESS	
Rapid Mix (mechanical, injection and in-1ine blenders)	2
Primary coagulant addition	6
Coagulant aid / flocculant chemical addition (in addition to primary coagulant use)	2
Flocculation	2
Filter aid addition (non-ionic/anionic polymers)	2
CLARIFICATION/SEDIMENTATION PROCESS	

Sedimentation (plain, tube, or plate)	4
Contact adsorption	6
Upflow Clarification	8
Horizontal-flow (rectangular basins)	5
Horizontal-flow (round basins)	7
Other clarification process (air floatation, ballasted clarification, etc)	6
FILTRATION PROCESS	
Granular Media filtration < 3gpm/sq. ft.	10
Granular media filtration > 3gpm/sq. ft.	20
Direct filtration	5
MEMBRANE FILTRATION	
for compliance with a NNPDWR	10
for compliance with a NNSDWR	6
Diatomaceous earth (pre-coat filtration)	10
Cartridge/bag	5
Gravity Sand Filter	5
Pressure or greensand filtration	20
Biologically active filter	15
Pre-filtration (staged cartridges, pressure sand w/o coagulation, etc.): add one point per stage to max of 3 points.	1-3
OTHER TREATMENT PROCESSES	
O_2 (aeration)	3
Packed tower aeration	5
Air stripping	5
Ion exchange softening	5
Lime-soda ash softening (includes: chemical addition, mixing/flocculation/clarification/filtration - do not add points for these processes separately)	20
Granular Activated Carbon (do not assign points when included as a bed layer in another filter)	5
Powdered activated carbon	2
Activated Alumina	5
Chemical Precipitation	15
BLENDING SOURCES WITH SIGNIFICANTLY DIFFERENT WATER QUALITY:	
to achieve compliance with a NNPDWR	4
to achieve compliance with a NNSDWR	2
Reservoir management employing chemical addition	2
Electrodialysis	15

Other: including but not limited to POE and POU devices, various adsorption technologies, ion-exchange for Arsenic removal.	2-15
RESIDUALS DISPOSAL	
Discharge to surface, sewer, or equivalent	1
Discharge to lagoon/drying bed, with no recovery/recycling - e.g. downstream outfall	1
On-site disposal, land application	1
Backwash recovery/recycling: discharge to basin or lagoon and then to source	3
Backwash recovery/recycling: discharge to basin or lagoon and then to plant intake	5
FACILITY CHARACTERISTICS	
Instrumentation - Use of SCADA or similar instrumentation systems to provide data, with:	
Monitoring/alarm only, no process operation	0
Limited process operation - e.g. remote shutdown capability	1
Moderate process operation	2
Extensive or total process operation	4
Design limitation regarding: clearwell, pumps, storage, etc.	1-5

C. Levels of required training and certification.

1. Operators certified at Level 1 shall receive training to include, but not limited to, General Operation/Maintenance, Security and Safety, Drinking Water Regulations, and Basic Distribution System training.

2. Operators certified at Level 2 shall receive training to include, but not limited to, General Operation and Maintenance, Backflow Prevention and Cross Contamination (Optional), Treatment-Disinfection/Fluoridation, Security and Safety, Water Quality Parameters and Sampling, and Drinking Water Regulations.

3. Operators certified at Level 3 shall receive training to include, but not limited to, Advanced Operation and Maintenance, Backflow Prevention/Cross Contamination, Treatment-Disinfection and Fluoridation Instrumentation, Security, Safety and Administrative Procedures, Water Quality Parameters and Sampling, SCADA or similar instrumentation systems, Drinking Water Regulations and Compliance.

4. Operators certified at Level 4 shall receive training to include, but not limited to, Advanced Operation and Maintenance, Backflow Prevention and Cross Contamination, Treatment-Disinfection and Fluoridation, Surface Water Treatment Plant Processes and Operation Security, Safety and Administrative Procedures, Water Quality Parameters and Sampling, SCADA or similar instrumentation systems, Drinking Water Regulations and Compliance.

§ 1405 CERTIFICATION REQUIREMENTS

To be certified, an applicant shall:

A. meet the experience and educational requirements in § 1409; and

B. pass a written examination for the level in which application is made as specified in § 1410, or

C. meet the reciprocity requirements in § 1407, in lieu of § 1406(B).

§ 1406 APPLICATION FOR CERTIFICATION

A. Any person who requires a certification shall complete, sign and submit to the Director an application for certification, on a form provided by the Director, together with fees required in § 1416. Applications must be received by the Director no later than 30 calendar days prior to

the date of examination.

B. An operator shall successfully meet the educational, experience and training requirements stipulated in § 1409, prior to application.

C. Each application submitted will be reviewed for completeness by the Director within 30 days of its receipt, or such longer time as the Director may deem necessary. The Director may also request additional information from the applicant when necessary to clarify or supplement previously submitted material. Request for such information will not render an application incomplete.

§ 1407 RECIPROCITY

A. The Director may issue a certificate without examination to an applicant who holds a certificate issued by another state, territory, the District of Columbia, tribal government, federal entity, or organization if the criteria in subsection ® of this section are met and upon the completion of the additional training specified in subsection (E) of this section.

B. An operator who is certified in another jurisdiction and requests a Navajo Nation certificate shall submit to the Director an application and a notarized copy of his/her current certificate with the appropriate fee, as specified in § 1416.

C. The criteria for issuing a Navajo Nation certificate are as follows:

1. The certificate from another jurisdiction must be current and valid for the particular type of public water system and level for which application is made.

2. The certificate from another jurisdiction must be issued under laws in compliance with § 1419 (a) of the SDWA Amendments of 1996 (Pub. L. 104-182).

3. The applicant shall meet the experience and education requirements in § 1409.

D. The application requesting a certificate will not be considered until all information, documentation, and fees are received by the Director. A determination will be made within 30 days thereof. If the application is approved, a certificate will be issued. If the application is disapproved, the Director will notify the applicant in writing that he/she will be afforded an opportunity to take the Navajo Nation examination. All fees will be applied to the cost of the next examination. All fees are non-refundable.

E. In addition to meeting the criteria specified in subsection (C) of this section, the applicant shall attend a full day of training pertaining specifically to the requirements of the NNSDWA and the NNPDWR after a letter from the Director approving certification is received by the applicant.

F. Certification by reciprocity is based upon the validity of the original certificate issued by another jurisdiction under laws in compliance with § 1419 (a) of the SDWA Amendments of 1996 (Pub. L. 104-182). The suspension or revocation of the original certificate upon which reciprocity is granted shall be reported to the Director within 10 working days of notification by the certifying agency. Failure to provide notification shall constitute fraud, deceit or misrepresentation and may result in suspension or revocation of the certificate pursuant to § 1414(B) and in any other enforcement action deemed appropriate by the Director.

§ 1408 GRANDPARENTING

A. Grandparenting is permitted only for existing operator(s) in responsible charge of existing systems at the time this Part of the NNPDWR becomes effective. Grandparenting permits an operator to obtain certification without meeting the certification requirements in § 1405.

B. The water system owner shall apply for certification on a form provided by the Director within 30 calendar days of the effective date of this Part. The Director will respond within 30 days from the date of application with a determination as to whether the operator is eligible for "grandparent" certification status. The Director will make this decision on a case-by-case basis, based upon a completed application, a written letter of request and supporting documents. If the operator is determined to be eligible for grandparent certification status by the Director, the operator may obtain Navajo Nation certification by submitting the fees specified in § 1416.

C. If the Director approves the certification, the following restrictions shall apply:

1. The certification must be site-specific and non-transferable to other operators.
2. If the classification of the plant or distribution system changes to a higher level, then the grandparented certification will no longer be valid.

3. If a grandparented operator chooses to work for a different water system, he or she must meet the initial certification requirements for that system.
4. Prior to certification, the grandparented operator shall attend a full day's training pertaining specifically to the requirements of the NNSDWA and the NNPDWR.

D. The grandparented operator shall, within 12 months of receiving initial certification, meet all requirements to obtain certification renewal, including the payment of any necessary fees, acquiring necessary training to meet the renewal requirements, and demonstrating the skills, knowledge, ability and judgment for that classification.

§ 1409 EXPERIENCE AND EDUCATION

A. To determine whether an applicant has adequate experience required for certification at a particular level, the Director shall consider the following:

1. Years of experience at a lower level; and

2. Previous experience, including experience in another jurisdiction or related field. The applicant shall have acquired at least 6 months of operational experience within the 5-year period preceding the date of application.

B. The Director shall not certify an applicant at more than one level higher than the level of the highest level water system at which the applicant has at least 1 year of experience.

C. For the purposes of this Part, a "qualifying discipline" means engineering, biology, chemical sciences, or a closely related technical or scientific discipline. The Director may require that the applicant provide transcripts or certificates to verify completion of the education requirements.

D. For the purposes of this Part, "qualifying experience" means experience directly in the field for which application is made. The fields of qualifying experience are water treatment and distribution.

E. An applicant shall meet the following requirements for admission to a certification examination:

1. For Level 1, high school graduation or equivalent and one year of qualifying experience in the operation of a class 1 or higher utility. No substitution for experience will be permitted.

2. For Level 2, at least:

a. High school graduation or the equivalent and 3 years of qualifying experience as a Level 1 certified operator; or

b. Two years of post-secondary education in a qualifying discipline and 1 year of qualifying experience, including 6 months as a certified Level 1 operator; or

c. A bachelor's degree in a qualifying discipline and 6 months of qualifying experience.

3. For Level 3, at least:

a. High school graduation or the equivalent and 2 years of qualifying experience, including 4 years of qualifying experience as a Level 2 certified operator; or

b. Two years of postsecondary education in a qualifying discipline, and 2 years qualifying experience as a Level 2 certified operator; or

c. A bachelor's degree in a qualifying discipline and 1 year qualifying experience as a Level 2 certified operator.

4. For Level 4, at least:

a. High school graduation or the equivalent and 6 years of qualifying experience, including 4 years of qualifying experience as a Level 3 certified operator; or

b. Two years of post-secondary education in a qualifying discipline and 4 years of qualifying experience, including 2 years as a certified Level 3 operator; or

c. A bachelor's degree in a qualifying discipline, and 1 year qualifying experience as a certified Level 3 operator.

F. Professional Development Hours (PDH) will be credited for attending training offered by providers of the Association of Boards of Certification (ABC) or other approved providers that address compliance of the Navajo Nation Safe Drinking Water Act and regulations.

§ 1410 EXAMINATION

A. Examinations will be given by the PWSSP under the authority of the Director. The examination shall be used to determine knowledge, ability and judgment of the applicant for a specific level of certification.

B. A score of 70% is required for certification. All examinations will be graded and applicants will be notified of the results within 30 days of examination date. Examination papers will not be returned to the applicant, but may be reviewed by the applicant at the PWSSP office. Under no circumstances shall the exams be viewed immediately after the examination or at the site of examination.

C. The Director shall not issue an initial certificate to an applicant who has not taken and passed the examination for certification, except as provided in §§ 1407 and 1408.

D. Examinations for certification will be scheduled at such times and locations as the Director deems appropriate.

E. If an applicant does not pass an examination for certification, the applicant may re-apply and re-test after 90 days from the date of the last examination.

§ 1411 EXAMINATION APPEAL PROCESS

A. All applicants with a score from 65% to 69% will be allowed to appeal an exam score by sending a letter of appeal to the Director within 30 days of receiving the notice of exam results.

B. The Director will schedule a date for the applicant to review the graded exam and indicate which questions are being appealed. The applicant will be given adequate time to specify the reason for the appeal. References are encouraged to be cited and supporting documentation may be submitted to substantiate claims that examination questions are flawed or ambiguous.

C. The Director will designate a proctor to oversee the appeal session. The proctor is prohibited from discussing any exam issues or to assist in the appeal of any missed questions.

D. At the end of the appeal session, the proctor will collect the exam, the answer sheet, the appeal form, and any notes or scratch paper. The proctor will also review any reference material brought to the appeal session to ensure that no notes or comments pertaining to exam questions have been added. The applicant will be allowed to leave with only the reference material that he/she brought to the session.

E. The Director will review the appeal and the supporting documentation submitted by the appellant and will make a determination within 30 days of the appeal. All decisions will be final, and no further appeals will be allowed.

§ 1412 RENEWAL OF CERTIFICATES

A. If the Director renews a certificate, the certificate shall be valid for a period of 3 years. A renewal application and a fee, set by the Director, payable to the Navajo Nation Public Water System Supervision Program shall be submitted at least 30 days prior to the expiration of each certificate. The request for renewal shall be approved by the Director provided that the criteria in subsections (B) or (C) are met.

B. Renewal will require that each certified operator be credited with having obtained 35 PDH in the 3-year period preceding the date on which the renewal application is due. Documentation of each training credit shall be on a form provided by the PWSSP and verification shall be provided in writing by the operator's supervisor or the entity that provided the education or training.

C. A certified operator may renew a certificate by taking and passing an examination for the same level and classification, in lieu of meeting the requirements specified in subsection (B) of this section.

§ 1413 AN EXPIRED CERTIFICATE

A. A certificate shall expire on the expiration date printed on the certificate, unless renewed before the expiration date pursuant to § 1412.

B. Expired certificates may be reinstated without penalty upon application within 30 days of the date of expiration. An expired certificate which has not been reinstated within the 30 day

period may be reinstated for the same level without examination if the certificate holder files the appropriate application, meets the requirements of renewal in § 1412 and submits payment for renewal fees specified in § 1416 plus $10.00 per month late fee for each month or portion thereof beyond the expiration date.

C. If an expired certificate is not renewed within 90 days of the certificate expiration date, the certificate shall not be reinstated. The certificate holder may re-apply and be re-examined as a new applicant.

§ 1414 SUSPENSION AND REVOCATION

A. The Director may suspend or revoke any or all certificate(s) held by a certified operator as stipulated under this section.

B. The Director shall suspend or revoke certification under the following circumstances:

1. The certificate-holder has been found by tribal, federal or state court to have violated laws applicable to drinking water systems.

2. The certificate-holder obtained a certificate through the use of fraud, deceit or misrepresentation.

3. The certificate-holder has prepared a false or fraudulent report or record regarding the operation or management of a drinking water system.

4. The certificate-holder has violated any other law that poses a risk to the health and safety of the public served by the drinking water system.

C. When the Director contemplates the suspension or revocation of a certificate, the Director shall serve upon the certificate-holder an initial order pursuant to the Uniform Rules § 304(a), containing a statement:

1. that the Director has sufficient evidence which, if not rebutted or explained, will justify the Director in suspending or revoking the certificate;

2. that indicates the general nature of the evidence; and

3. that unless the certificate-holder within 30 days after service of notice requests a hearing pursuant to Uniform Rules § 305, the Director will take the contemplated action and judicial review will not be available. If the certificate-holder requests a hearing, the Director shall designate a Hearing Official and a Hearing Clerk and a hearing shall be held pursuant to Uniform Rules Subpart 3(C). Judicial review of the final order shall be available pursuant to Uniform Rules § 332.

4. Notwithstanding Uniform Rules § 304(b)(3), an order suspending or revoking a certificate need not specify a schedule for compliance.

D. If any certificate held by an operator is suspended or revoked by the Navajo Nation, a letter to request re-application and re-examination may be submitted to the Director for consideration upon the expiration of the action and in accordance with the final determination of the suspension or revocation.

1. The Director shall make a determination and respond in writing within 30 days of such request to permit or deny re-application and re-certification. The Director may request additional information to evaluate the severity of the violation that led to the suspension or revocation, any good faith efforts to remedy that violation, and any other factors that the Director deems relevant in the determination.

2. Each request for re-application and re-examination will be considered on a case-by-case basis. The Director may seek the advice of the Advisory Board to make a decision.

3. Under no circumstances shall an approval for re-application and re-examination be in conflict with a previously issued suspension or revocation.

4. All decisions by the Director are final. If approved, the applicant shall be permitted to re-apply and retake the exam as a new applicant subject to the certification requirements of this Part. If disapproved, a letter of denial with an explanation will be issued.

§ 1415 UTILITY OPERATORS CERTIFICATION ADVISORY BOARD

A. Pursuant to § 2539 of the NNSDWA, a Board shall be appointed by the Director to make recommendations and provide technical advice and assistance to the Director as may be needed.

The Director shall promptly notify the Board of all matters brought before the Director to which the NNPDWR Operator Certification requirements are applicable.

B. The Board shall consist of five (5) members appointed by the Director as follows:

1. 1 employee of PWSSP;

2. 1 manager, director or administrator of Navajo Tribal Utility Authority;

3. 1 employee of Navajo Area Bureau of Indian Affairs;

4. 1 currently employed operator of a water system on the Navajo Nation;

5. 1 representative of small public water systems within the Navajo Nation; and

The Director shall also appoint two certified operators to serve as alternates to Board members in their absence. All alternates appointed prior to the effective date of this Part will be allowed to serve out the remainder of their three-year terms.

C. Appointments to the Board shall be for 3-year terms. The Director shall appoint new Board members at its first meeting of each fiscal year. The terms shall overlap so that no more than three terms shall expire in any one year. A Board member may be reappointed, but no member, except the PWSSP member, may serve more than two consecutive terms.

D. At the first meeting of the Board each fiscal year, the Board shall elect from its members a chairperson and such officers as deemed necessary. The PWSSP member shall be the executive secretary and shall keep records of all meetings for the review of the Director. The Board shall meet at least 4 times per year.

E. A quorum shall consist of at least three members: the chairperson or designated representative, executive secretary or designated representative, and one other member of the Board.

F. In the event of a vacancy caused by death, resignation, or removal for cause, the Director shall appoint a successor for the unexpired term.

G. The duties of the Board shall include:

1. Advise the Director in administering and implementing this Part by providing a forum for the discussion of technical and administrative issues, and by providing training assistance or information on such assistance;

2. Review proposed new and/or revisions to rules and guidelines under this Part;

3. Make recommendations to the Director for replacement members when a Board vacancy occurs;

4. Perform any other function with regard to this Part XIV of the NNPDWR (Operator Certification Regulations).

H. Any Board member failing to attend three consecutive regular meetings shall be automatically removed as a member of the Board. The Director may remove any member of the Board for neglect of any duty required by law, for incompetency or for unprofessional conduct and shall remove any Board member who violates any provision of the NNSDWA or the NNPDWR. The Director shall fill any vacancies on the Board.

I. All Board members shall be paid upon the availability of funds.

§ 1416 FEE SCHEDULE

A. An applicant must pay the fees listed in the attached fee schedule. These fees may be revised by the Director to reflect operator certification and training program costs, pursuant to the rulemaking requirements of Uniform Rules Subpart 4.

B. All fees must be paid to the Navajo Nation Public Water Systems Supervision Program.

C. In the event that an applicant is denied reciprocity or renewal of a certificate, the fees may be transferred to cover future application, renewal or examination fees. At no time will fees be returned to the applicant.

D. The fees may be used to cover the cost of examination services, training material reproduction, postage, and other certification-related costs.

E. If a grandparented operator is currently certified, renewal fees shall apply. If a grandparented operator is without a current certificate, then initial fees shall apply.

Part XV
MINIMUM DESIGN REGULATIONS

§1501 PURPOSE

These regulations are intended to ensure that new public water systems and substantial modifications to existing public water systems are capable of supplying adequate quantities of water which consistently meet applicable drinking water quality requirements and do not pose a threat to public health. All such facilities shall be designed to function properly in compliance with the NNSDWA and the NNPDWR. These design regulations establish minimum requirements only and do not diminish the duty of owners and operators to comply with applicable statutes and regulations and industry standards and to provide adequate system design and performance. However, the Director will find that a proposed design that complies with the regulations in this Part is "satisfactory" for purposes of §2551 (A)(2) of the NNSDWA.

§1502 APPLICABILITY

These regulations apply to all new public water systems and substantial modifications to existing public water systems. In addition, §§1506 and 1509 apply to bottled water systems where specifically provided. The PWSSP will take these regulations into account when reviewing applications for and issuing construction permits. In addition, the Director may require an existing public water system up upgrade to meet the requirements of this Part if the public water system is consistently violating the NNSDWA and the NNPDWR and posing significant risks to the public health and the Director determines that the modification is necessary to bring the public water system into compliance and protect the public health. The Director will propose the upgrade pursuant to the permit modification procedures in Uniform Rules §§204(C), 205(C) and 207-214.

§1503 LOCATION REQUIREMENTS

To the extent practicable, a new water system or substantial modification to an existing water system shall be geographically located to avoid a site which is:

A. Subject to a significant risk from earthquakes, floods, fires, or other disasters which could cause a breakdown of the public water system or portion thereof; or

B. Within the flood plain of a 100-year flood or of highest flood level experienced in the past if the 100-year flood plain has not been defined, except for intake structures, properly protected wells and properly designed wash, creek and river crossings.

§1504 WATER CONSUMPTION

For community water systems and non-transient non-community water systems, the water usage rate, defined as gallons per home per day (gphd) or gallons per capita per day (gpcd), is used to determine the amount of water that will be utilized by the water system. The Engineer shall determine the total usage through engineering analyses that use operating data from the existing system or other guidelines and parameters accepted by the engineering community of the Navajo Nation, and shall submit documentation of that calculation in the Engineering Report that is submitted to the Director pursuant to Part XVI of these regulations. The water usage rate shall in no case be less than 200 gphd.

§1505 WATER SUPPLY

A water supply shall be provided which is capable of providing for the average daily system demand for the design population (as defined in §104) of the system in approximately 12 hours or less. This criterion is also applicable to booster stations. For duplex stations, only the capacity of one pump should be considered for meeting the 12 hour-average daily design demand requirement. It is permissible for pump capacity to be less than the 12 hour-average daily design demand requirement, when justified. Variable speed boosters and other types of boosters may also be used in the system if they are equivalent to above booster requirements or better. Water supply is rated in gallons per minute (gpm) and pumping cycle in hours per day.

§1506 WATER SOURCES

The Engineer shall provide all necessary information to the Director to ensure that the source(s) selected are of satisfactory quality, or shall be treated to meet the requirements of the NNPDWR and meet/exceed the demand of the system. The best available source of water that is both economically and technically feasible shall be utilized for the water supply. All water systems should identify an alternative source of supply in case of an emergency, when the primary source cannot be used, pursuant to §2545 of the NNSDWA.

A. The PWSSP shall classify all existing or new water sources as either:

1. Surface water or groundwater under the direct influence of surface water, or as
2. Groundwater not under the direct influence of surface water.

The groundwater under the direct influence of surface water, which may be a ground water well or a spring, shall meet all the treatment requirements of the surface water.

B. All new/existing drinking water sources, that have not previously been analyzed, shall be analyzed as initial water quality by a certified laboratory (as defined in §402) for the following factors and results shall be provided to the Director for review:

1. Physical properties (refer to Table 1800.1);

2. Inorganic Chemicals (refer to Table 200.1 and Table 1800.1);

3. Synthetic Organic Chemicals (refer to Table 200.3);

4. Volatile Organic Chemicals (refer to Table 200.2);

5. Bacteriological contaminants (refer to Table 200.5); and

6. Radionuclides (refer to Table 200.10).

C. Surface Water Sources:

1. Quality:

An engineering evaluation shall be made considering all factors, both natural and man-made, which may affect the quality of the source water. The evaluation shall include, but not be limited to:

a. Projection of possible future uses of impoundments or reservoirs;

b. Assessing degree of hazard to the source from the accidental spillage of materials that may be toxic, harmful or detrimental to treatment processes;

c. Obtaining samples over a sufficient period of time (covering all four seasons of a year) to assess the microbiological, physical, chemical and radiological characteristics of the water and their variation;

d. Assessing the capability of the proposed treatment process to comply with the NNPDWR; and

e. Consideration of currents, wind and ice conditions, and the effect of tributary streams at their confluence.

2. Intake Structures:

The design of intake structures shall provide for:

a. Withdrawal of water from more than one level if quality varies with depth;

b. Lowest inlet port located above the bottom, but at sufficient depth to be kept submerged at low water levels;

c. Separate facilities for release of less desirable water held in storage;

d. Occasional cleaning of the inlet line;

e. Screens or gratings over the inlet to protect the pumps; and

f. A means for periodic cleaning of the screens or gratings.

3. Impoundments:

The design of an impoundment reservoir shall provide for, where applicable:

a. Removal of brush, trees, and stumps to the high water level; and

b. Protection from floods during construction.

D. Ground Water - Wells:

1. Location

a. The location of the public water well shall be at least one hundred (100) feet from

all potential pollution sources except where the professional engineer or the professional geologist can justify a lesser distance based in part on hydrogeological conditions or special well construction techniques or where the pollution source is designed in such a manner as to prevent the release of contaminants to the environment.

A greater pollution free radius shall be required where water from water table aquifers will be used.

A Wellhead Protection Area Inventory must be performed based on the location and expected yield of the proposed well. Refer to Part XVII of these regulations for details.

b. The proposed well site must:

i. be readily accessible for cleaning, testing, monitoring, and maintenance;

ii. have the finished grade sloped away from the well to prevent any surface runoff from collecting or ponding;

iii. Be located up-slope and away from potential contaminants; and

iv. Be fenced to prevent unauthorized access.

2. Well Materials, Design and Construction:

a. Well casings, drop pipes, well screens, coatings, adhesives, pumps, switches, electrical wire, sensors and all other equipments or surfaces which may be in contact with drinking water must comply with ANSI/NSF Standard 61.

All substances introduced into the well during construction or development shall comply with ANSI/NSF Standard 60. This requirement applies to drilling fluids (biocides, clay thinners, defoamers, foamers, lubricants, oxygen scavengers, viscosifiers, weighting agents) and regenerants. This requirement also applies to well grouting and sealing materials which may come in direct contact with the drinking water.

b. Permanent steel casing pipe shall:

i. Be new steel casing pipe meeting AWWA Standard A-100, ASTM or API specifications;

ii. Be capable of withstanding forces to which it is subjected;

iii. Have full circumferential welds or threaded coupling joints; and

iv. Project at least 18 inches above the anticipated final ground surface. At sites subject to flooding, the top of the well casing shall terminate at least 36 inches above or the well shall be provided with water tight cap and a vent terminating 36 inches above the 100-year flood level or the highest known flood elevation where the 100-year flood level has not been established.

c. The use of any non-ferrous material for a well casing shall require prior approval from the Director. Thermoplastic water well casing pipe shall meet ANSI/ASTM Standard F480-76 and shall bear the logo NSF-wc indicating compliance with NSF Standard 14 for use as well casing.

d. Screens:

The use of well screens is recommended where appropriate and, if used, they shall:

i. Be constructed of material resistant to damage by chemical action of groundwater or cleaning operations;

ii. Have openings sized based on sieve analysis of water bearing formations or gravel pack materials;

iii. Have sufficient diameter to provide adequate specific capacity and low aperture entrance velocities; and

iv. Be provided with a bottom plate or washdown bottom fitting of the same

material as the screen.

e. Casing Perforations:

The placement of perforations in the well casing shall:

i. Be located so as to permit as far as practical the uniform collection of water around the circumference of the well casing; and

ii. Be of dimensions and size to restrain the water bearing soils from entrance into the well.

f. Gravel Pack Wells:

The gravel pack material shall be well rounded particles, 95 percent siliceous that are smooth and uniform, free of foreign material, properly sized, washed and then disinfected immediately prior to or during placement as per AWWA standard C654. The gravel pack shall be placed in one uniform continuous operation.

g. Well Plumbness and Alignment:

Well plumbness and alignment shall be tested in accordance with the AWWA Standard A-100. The completed well shall be sufficiently plumb and straight so that there will be minimal interference with installation, alignment, operation, or removal of the test or permanent pumps.

h. Well Grouting:

All permanent well casing for drinking water wells shall be grouted to a depth of at least 50 feet below ground surface or firm bedrock whichever is less. However, where bedrock is encountered at less than 20 feet, casing shall be grouted to at least 20 feet depth. Sufficient annular opening shall be provided to permit a minimum of 2 inches of grout between the permanent casing and the drilled hole, taking into consideration any joint couplings. If a carrier casing is left in place, the casing shall be grouted so as to ensure contact with the native formations. The carrier casing may be perforated if the Engineer desires. Protection shall be provided to prevent leakage of grout into the screen or the gravel pack.

3. Well Development:

Every well shall be developed to remove the native silts and clays, drilling mud or finer fraction of the gravel pack. Development should continue until the expected maximum capacity is obtained from the well.

4. Well Testing for Performance:

The pumping test shall not be conducted until the well has been adequately developed. Both the step-drawdown and constant-rate tests shall be conducted to determine well capacity, type of pump and the time-drawdown characteristics meeting requirements of AWWA standard A-100. The engineer shall submit detailed procedures and specifications of these tests and analyses in the application package for the construction permit.

The following records shall be kept of the tests along with weather conditions and other pertinent information and submitted to the Director for review:

a. Date and time of starting and ending the test;

b. Name of the person(s) conducting the test.

c. Pumping rate and water level measurements with time;

d. Depth of water level increase with time after stopping the pumping test to evaluate well recovery; and

e. Analysis and interpretation of the test results;

5. Well Disinfection:

All new, modified, or reconditioned wells, including pumping equipment, shall be disinfected according to AWWA Standard C654 before being placed into service for drinking water use. Bacteriological water samples shall be collected according to the standard and analyzed by EPA-certified laboratory. The chlorine residual readings at the time and place

of the bacteriological samples must also be submitted.

6. Well Abandonment:

Abandonment of wells shall conform to the followings:

a. Test wells and groundwater sources which are to be permanently abandoned shall be sealed by such methods as necessary to restore the controlling geological conditions which existed prior to construction.

b. Wells to be abandoned shall be sealed to prevent undesirable exchange of water from one aquifer to another. Preference shall be given to using a neat cement grout. Where fill materials are used, which are other than cement grout or concrete, they shall be free of foreign materials and shall not contaminate the ground water.

c. Complete and accurate records shall be kept for the entire abandonment procedure and shall be submitted to the Director.

7. Well Head Piping and Pumping Facilities:

a. General Requirements:

i. A sanitary seal or pitless unit must be provided on the top of the well casing. A pressure gauge and air line or other method for readily measuring the water level in the well shall also be provided;

ii. A casing vent shall be provided. The vent must be elbowed downwards and screened to prevent entry of insects;

iii. A check valve shall be provided in the pump discharge line. For jet pumps, no check valve is required in the main line but a back-flow/back-siphonage device must be provided on blow offs and sample cocks;

iv. A sampling tap must be provided for raw water sampling downstream of the check valve and prior to any chemical injection point. It must be equipped with a vacuum breaker device to prevent back-flow/back-siphonage;

v. A flow meter shall be provided on each well;

vi. Adequate support for the well pump and drop pipe must be provided;

vii. An hour meter shall be provided to record the elapsed run time of each well pump;

viii. A manual control switch shall also be provided for each well pump; and

ix. All electrical wiring shall be in conduit and meet the requirements of the National Electric Code.

b. Well Head Piping:

The discharge piping shall:

i. Be designed so that the friction loss will be low;

ii. Be protected against surge or water hammer;

iii. Have control valves located above the pump house floor; and

iv. Have all exposed piping valves and appurtenances protected against physical damage and freezing.

E. Ground Water - Springs:

Springs vary greatly in their characteristics and they should be observed for some time prior to development to determine any flow and quality variations. They must be determined whether or not they are "under the direct influence of surface water". The springs determined to be under the direct influence of surface water will have to be given "surface water treatment".

The development of springs shall comply with the following requirements:

1. The spring collection device, whether it be collection tile, perforated pipe, imported gravel, infiltration boxes or tunnels, must be covered with a minimum of ten feet of

relatively impervious soil cover. Such cover must extend a minimum of 15 feet in all horizontal directions from the spring collection device.

Where it is impossible to achieve the ten feet of relatively impervious soil cover, an impermeable liner may be used, provided:

a. The liner has a minimum thickness of at least 10 mils;

b. All seams in the liner are folded or welded to prevent leakage;

c. The liner is certified as complying with ANSI/NSF Standard 61; and

d. A minimum of two feet of relatively impervious soil cover is placed over the impermeable liner.

2. Each spring collection area shall be provided with at least one collection box to permit spring inspection and testing.

3. All junction boxes and collection boxes must be provided with access manholes, air vents and overflow piping. Lids of these spring boxes shall be fitted with sanitary gaskets.

4. The spring collection area shall be surrounded by a fence located a distance of 50 feet (preferably 100 feet if conditions allow) from all collection devices on land at an elevation equal to or higher than the collection device, and a distance of 15 feet from all collection devices on land at an elevation lower than the collection device. The elevation datum to be used is the surface elevation at the point of collection.

In remote areas where no grazing or public access is possible, the fencing requirement may be waived by the Director.

In populated areas, a six-foot high chain link fence with three strands of barbed wire may be required.

5. All vegetation which has a deep root system shall be removed from the fenced area.

6. Surface water runoff must be diverted away from the spring collection area by constructing a diversion channel or berm around the fence.

7. A permanent flow measuring device shall be installed. Flow- measurement devices such as critical depth meters or weirs shall be properly housed and otherwise protected.

8. The spring shall be developed as thoroughly as possible so as to minimize the possibility of excess spring water ponding within the collection area. Where the ponding of spring water is unavoidable, the excess water shall be collected by shallow piping or french drain and be routed beyond and down grade of the fenced area required above, whether or not a fence is in place.

§1507 WATER STORAGE

For community water systems and non-transient non-community water systems, water storage shall be provided to ensure that safe, potable water is available for both normal and emergency situations, such as pipeline breaks, equipment failures, or natural disasters. For single-source systems, five-days storage plus any fire flow reserve should be provided. The single-source storage requirements can be reduced to three-days storage plus any fire flow reserve if the system is provided with an emergency standby pump. For multi-source systems, storage requirement should be at least 1.5 days-storage plus any fire flow reserve plus a volume determined by subtracting from one day's storage the volume of water that the remaining water sources can provide in 18 hours if the largest source is out of service.

Adequate controls shall be provided to maintain levels in distribution system storage structures. Also, storage structures shall be designed so they can be isolated from the distribution system for the purpose of draining, maintenance and repair.

A. Ground-level/Elevated Storage Tanks and Standpipes:

The materials and design of storage structures shall provide stability and protection of the stored water. Storage structures shall be designed in accordance with appropriate current AWWA Standards whenever applicable.

The ground-level/elevated storage tanks and standpipes shall:

1. Be sized to meet the pressure requirements in the distribution system;

2. Be structurally competent and constructed of materials that are acceptable to the

Director;

3. Be readily accessible at all times for inspection and maintenance;

4. Be tightly secured within a fenced area to prevent any unauthorized access, vandalism, contamination or sabotage;

5. Have suitable watertight roofs which exclude birds, animals, insects, and dust. The roof shall have vents, which shall be screened with appropriate non-corrodible mesh;

6. Be provided with adequately sized drains;

7. Be provided with an overflow pipe of sufficient diameter to permit the discharge of water equal to or greater than the filling rate. The overflow pipe shall be brought down to below 24 inches above the ground surface or piped to daylight, be screened with appropriately sized non-corrodible mesh and discharge over a splash pad to prevent ground erosion.

8. Be provided with access ladders, ladder guards, balcony railings, and safely located entrance. The outside ladder shall be provided with a safety cage complying with the latest OSHA Standards.

9. Be designed to remain functional in extremely cold weather.

10. Be designed to give proper protection to metal surfaces by paints or other protective coatings, by cathodic protective devices, or by both. All paint coatings which come into contact with drinking water shall be certified as meeting the specifications of the ANSI/NSF Standard 61, Drinking Water System Components - Health Effects.

11. Be disinfected in accordance with current AWWA Standard for the Disinfection of Water Storage Facilities.

12. Meet applicable Occupational Safety and Health Administration (OSHA) Standards.

B. Clearwell:

1. Clearwell storage shall be sized, in conjunction with distribution system storage, to relieve the filters from having to follow fluctuations in water use;

2. When finished water storage is used to provide the contact time for chlorine, special attention shall be given to size and baffling;

3. An overflow shall be provided; and

4. Finished water must not be stored or conveyed in a compartment adjacent to unsafe water when the two compartments are separated by a single wall.

C. Hydropneumatic (Pressure) Tanks:

Hydropneumatic (pressure) tanks shall:

1. Not be used in a public water system with more than 10 service connections unless the system is provided with a separate storage tank along with it to meet the storage requirements;

2. Be deemed inadequate for protection from fire and the storage of water;

3. Be completely housed and, except as authorized by the Director, located above the ground level;

4. Meet the pressure requirements of the distribution system;

5. Have interior paint coatings meeting the specifications of the ANSI/NSF Standard 61, Drinking Water Systems Components - Health Effects;

6. Be provided with a bypass piping to facilitate repair or painting without removing well(s) or booster pump(s) from service; and

7. Be provided with all necessary appurtenances such as isolation valves, sample tap, pressure gauge, air make-up system (except for bladder tanks), pressure relief valve, and pressure operated start and stop controls for the pump.

§1508 DISTRIBUTION

The Engineer shall ensure that the distribution system of the public water system is adequate to deliver sufficient volumes of water of appropriate quality and pressure to the area of service within the public water system. Prior to installing or replacing appurtenances, such as, but not limited to, valves, hydrants, and pipes, it must be ensured that the components are fully functional without any breaks, splits or other defects and that all foreign materials and objects are removed. During the construction of a distribution system, any opening in unfinished piping or appurtenances must be sealed at the end of each working day in such a manner so as to prevent the entry of any rodents and other animals, dirt, trench water and other sources of pollution or contamination.

A. Distribution System Materials:

The Engineer shall ensure that the pipes, fittings, and valves used in the public water distribution system are appropriate given the soil and pressure conditions throughout the system. Acceptable types of piping materials include, but are not limited to, Polyvinyl Chloride (PVC), Polyethylene (PE), High Density Polyethylene (HDPE), Ductile Iron, Stainless Steel, and Cast Iron. These pipes, fittings, packing and jointing materials shall conform to the appropriate AWWA and ASTM standards. All materials or products which come into contact with drinking water shall be certified as meeting the specifications of the ANSI/NSF Standard 61, Drinking Water System Components - Health Effects. The certifying party shall be accredited by the American National Standards Institute. The pipes, fittings, solder, or flux used in the installation or repair of the public water system must be lead-free pursuant to §201 of the Navajo Nation Safe Drinking Water Act. Asbestos cement pipe shall not be used except in the repair of existing asbestos cement lines. Thermoplastic pipe shall not be used above grade.

B. Hydraulic Analysis:

The Engineer shall size all water mains after a hydraulic analysis of the distribution system based on flow demands and pressure requirements. The distribution system shall be designed to maintain and shall maintain a minimum pressure of 20 pounds per square inch at ground level at all points in the distribution system under all conditions of flow. However, the Director may allow the minimum pressure between 15 and 20 psi for the modification of existing systems on a case-by-case basis if the engineer can demonstrate that no backflow/back-siphonage situation can arise. The maximum pressure, measured at the user's meter, shall not exceed 70 pounds per square inch. If the calculations needed to conduct this hydraulic analysis are complex, a computerized network analysis shall be performed to verify that the distribution system will be capable of meeting the minimum pressure requirements. Where improvements will upgrade more than 25% of an existing distribution system, or where a new distribution system is proposed, a hydraulic analysis of the entire system shall be prepared and submitted to the Director for review.

The diameter of water mains not connected to fire hydrants must have a nominal size of at least 2 inches. The minimum diameter of a water main serving a fire hydrant lateral shall be at least 6-inches unless a hydraulic analysis indicates that required flow and pressures can be maintained by smaller lines.

C. Installation of Water Mains and Service Lines:

Piping for the distribution system shall be designed and laid in a manner such that appropriate consideration is given to frost depth, type of backfill and surface loads while undertaking trenching, bedding, and refills. Construction specifications shall incorporate the provisions of appropriate AWWA and ASTM standards and/or manufacturer's recommended installation procedures.

Water mains shall be:

1. Properly bedded and covered with a sufficient amount of earth or insulation to prevent freezing;

2. Installed with at least 42" of cover over the piping or at least 12 inches below frost depth, whichever is deeper (unless otherwise specified);

3. Located at least 15 feet away from any existing structure such as a house or building unless written permission or a signed waiver is obtained from the owner; and

4. Installed so that they do not pass through, under, or come into contact with any part of a sewer manhole.

Water service lines shall:

1. Be properly bedded and covered with a sufficient amount of earth or insulation to prevent freezing;

2. Be installed with at least 36" of cover over the top of the pipe; and

3. Have at least one corporation stop and one curb stop or meter stop.

Areas which have been disturbed due to the installation of pipes within the distribution system shall be brought to true grades. All excess debris shall be properly disposed of. Marker posts shall be installed at all road crossings, water valves, points of intersection and bends and in other pertinent areas.

D. Separation of Water Lines and Sewers:

Water and sewer lines shall be separated in order to protect public water systems from possible contamination. For the purpose of this section, the term "lines" shall include mains, laterals and service lines for both water and sewer.

1. Parallel Installation: When sewer and water lines are parallel to each other the water line must be in a separate trench and:

   a. Located at least 10 feet away from the sewer line as measured horizontally from the exterior walls of the pipes.

   b. If the 10 feet requirement is unattainable due to existing structures or other physical conditions, deviations may be allowed by the Director if supported by data from the design engineer, provided the water line is:

      i. Located at least 5 feet away from the sewer line as measured horizontally from the exterior walls of the pipes; and

      ii. At least 12 inches higher than the sewer line as measured vertically from the exterior walls of the pipes.

2. Crossings: When sewer and water lines must cross each other, the water line must be:

   a. Located at least 12 inches above the sewer line as measured vertically from the exterior walls of the pipes; or

   b. Located at least 12 inches below the sewer line as measured vertically from the exterior walls of the pipes if and ONLY if the water line cannot be located above the sewer line.

   The water line must be continuous and free from any joint within 10 feet of crossing a sewer line on either side. Backfill of the trenches shall be compacted to provide adequate support to prevent settling of the lines.

3. Sewer Manholes: No water line shall pass through or come in contact with any part of a sewer manhole. The minimum horizontal separation between water lines and manholes shall be 10 feet, measured from the center of the manhole.

4. Sewage Disposal Systems: Water lines shall not be laid less than 10 feet horizontally from a septic tank, 25 feet from a drain field, or 50 feet from an outhouse. Also water lines shall not be installed within 100 feet of the perimeter fence of an individual lagoon, or within 500 feet of the perimeter fence of a community lagoon.

E. Separation of Water Lines and Other Buried Utilities:

When water lines are laid parallel to other buried utilities such as electric or gas lines, the horizontal separation distance between the water line and utilities shall be as per the requirements of the respective utility authorities. In the absence of such requirements by the utility authorities, a minimum separation of 10 feet shall apply.

F. Fire Hydrants and Fire Flow Requirements:

The project engineer shall contact the Navajo Nation Fire Department for the fire flow requirements. If fire flow is to be provided, fire hydrants shall be installed on 6-inch or larger diameter mains and the pipe network shall be designed so that it meets the fire flow requirements while maintaining a minimum water pressure of 20 psi at all times and at all points in the distribution system. As a minimum, the flows to be assumed during a fire-flow analysis shall be the "peak day demand" plus the fire flow requirement. The fire hydrants shall conform to AWWA C502 and C503 Standards. A gate valve and a valve box shall be installed adjacent to the fire hydrant.

G. Valves:

All buried valves within the distribution system shall be installed with valve boxes. The top of the valve box shall be slightly above the finished grade so as to provide drainage away from

the structure. A 2-foot by 2-foot by 4-inch concrete pad shall be poured around the valve box and the valve size, the type of valve and the direction of flow through the valve shall be clearly indicated on the concrete pad before it hardens.

1. Flush Valves:

A distribution system shall be designed, to the extent possible, so as to form a grid system or arterial loops to minimize the number of dead ends. If a dead end cannot be eliminated, the line shall terminate with a flushing device if it exceeds 500 feet in length.

2. Isolation Valves:

Water mains must contain a sufficient number of isolation or gate valves in order to minimize any inconvenience to customers and sanitary hazards resulting from repairs.

The Engineer shall locate isolation valves in such a manner as to minimize the number of houses that will be taken out of service by the isolation of a particular portion of the service area.

3. Pressure Reducing Valves:

Due to large changes in elevation throughout the Navajo Nation, pressures within the distribution system can become excessive. Therefore, it is necessary to provide pressure reducing valves so that the pressure limitations of the network of pipelines are not exceeded and the need for installing individual pressure reducing valves is minimized. The Engineer shall examine the alternatives and consider the potential for future expansion prior to installing a pressure reducing valve on a main line. Pressure reducing valves should be provided based on the hydraulic analysis results and the pressure requirements in §1508B.

4. Air Relief Valves:

Air relief valves shall be provided in water mains in areas where air tends to accumulate. Automatic air relief valves shall not be used in situations where flooding may occur.

H. Thrust Blocking:

Where appropriate, all tees, bends, plugs, crosses and fire hydrants in the distribution system shall be provided with reaction/thrust blocking, tie rods or other approved restraining methods to prevent movement. The thrust blocking shall not block weep holes or obstruct access to the joints of the pipe or fittings.

I. Surface Water Crossings:

1. Above-water crossings: The pipe shall be adequately supported and anchored, protected from damage and freezing, and accessible for repair or replacement.

2. Underwater crossings: Underwater crossings shall be installed at a depth greater than 6 feet below the wash bottom. Wash crossings constructed of PVC, ductile iron or HDPE are acceptable. PVC may be installed across minor washes given that the burial depth is appropriate. Whereas, HDPE may be preferred for major and/or flowing washes. Blue marker posts shall be located on both sides of the wash crossing to indicate the point at which the type of pipes differ. Also, gate valve shall be provided at least to the upstream side of water crossings so that the section can be isolated for testing or repair. The valves shall be accessible and not subject to flooding.

J. Road Crossings:

General requirements:

1. Permission must be obtained from the appropriate road authorities prior to excavation or boring;

2. The road crossing shall be open-cut and at 90° to the road centerline or as permitted by the road authority except for paved highway crossing, which may require utilizing boring equipment to avoid cutting the pavement;

3. The water line shall be buried at a minimum depth of 42" below the ditch line;

4. A gate valve shall be installed with a valve box on the upstream side of the road crossing; and

5. Upon placement of the pipe, the road shall be restored to its original condition and excess materials or debris shall be removed from the construction site.

Additional requirements for roads which are maintained dirt school bus routes:

1. Pipes shall be Class II ductile iron pipe;

2. The limits of the ductile iron pipe shall be 10 feet outside the apparent ditch line, unless circumstances dictate greater lengths; and

3. Marker posts shall be placed over each side of the road where the transition occurs between the ductile iron pipe and PVC pipe.

Additional requirements for roads which are gravel roads with platted right-of-ways and paved highways:

1. Pipes shall be PVC or ductile iron pipe cased within a steel conduit;

2. The limits for crossing encasement shall be from right-of-way line to right-of-way line; and

3. Marker posts shall be placed at the highway right-of-way lines over the pipe.

K. Pressure and Leakage Testing:

All newly installed water lines shall be pressure tested and leakage tested in accordance with appropriate AWWA Standards. Other methods of testing may also be acceptable subject to the prior approval of the Director. The Engineer should provide details of the test procedure and specification while applying for the construction permit.

L. Disinfection:

All new water lines shall be properly disinfected and the evidence provided to the Director prior to placing them into use for water conveyance. For purposes of this subsection, "new" water lines shall not include repaired or replaced lines. Specifications shall include detailed procedures for the adequate flushing, disinfection and microbiological testing of all new water mains, laterals or service lines. Samples for coliform analyses shall be collected after disinfection is complete and the system is refilled with potable water. The use of water for culinary purposes shall not commence until the bacteriological tests indicating the water to be free from contamination has been reviewed and approved by the Director.

M. Booster Pumps:

Booster pumps shall be located or controlled so that they will not produce negative pressure in their suction lines and have a device for automatic control which prevents excessive cycling. If necessary, the Engineer shall ensure that a bypass is available for use.

All water systems that rely in whole or in part on a booster pump station shall be equipped with onsite back-up power facilities, or at least with the ability to readily obtain a portable generator. The primary intent for recommending back-up power is to assure that the distribution system is pressurized at all times to minimize contamination due to backflow and backsiphonage.

§1509 CROSS-CONNECTION CONTROL AND BACKFLOW PREVENTION

A. The Engineer shall ensure that there are no unprotected connections between the supplies of water, systems for pumping, storage and treatment of water, and distribution system of the public water system and any source of pollution or contamination pursuant to which any unsafe water or other degrading material can be discharged or drawn into the public water system as a result of backsiphonage or backflow.

B. The distribution system including service connections must have an assembly for the prevention of backflow as per the requirements of part XX of these regulations.

Part XVI
CONSTRUCTION PERMITS

§1601 PURPOSE

Pursuant to subchapter 5 of NNSDWA, the Director shall review plans, specifications, and other pertinent data to ensure proper design and construction of new public water systems and of substantial modifications to existing public water systems. This part of the NNPDWR establishes procedures and requirements for obtaining construction permits from the NNEPA to enable such review.

§1602 APPLICABILITY

These regulations apply to all new public water systems, substantial modifications to existing public water systems, and bottled water systems within the jurisdiction of the Navajo Nation.

§1603 REQUIREMENTS FOR CONSTRUCTION PERMITS

A. Before the construction of any new public water system or bottled water system or of any substantial modification to an existing public water system begins, an application for a permit to construct shall be made to, and a permit to construct obtained from, the Director. In addition, the PWSSP must be notified of the construction start date at least seven (7) days in advance of that date. Failure to obtain a permit to construct is a violation of the NNSDWA (Subchapter 7) and is subject to an enforcement action by the Director.

B. The application for a permit to construct shall include the following:

1. A completed application form obtained from the Director;

2. Appropriate fee, as determined by the Director;

3. Two (2) sets of detailed plans, as required in §1606;

4. Two (2) sets of material and construction specifications, as required in §1607;

5. Engineering Report, as required in §1608;

6. Two (2) copies of wellhead/watershed protection area inventory;

7. A copy of Right-of-way approval;

8. Construction Schedule;

9. If the owner of the project is different from the utility supplying water, a letter from the utility supplying water stating its willingness and ability to serve the project; and,

10. If the owner of the project is different from the utility that will be responsible for operating and maintaining the project, a letter from that utility acknowledging such responsibility.

C. Before a permit to construct can be issued for a new public water system, the applicant shall demonstrate to the satisfaction of the Director that the new system will be a "viable water system". A "viable water system" is one that is self-sustaining and has the commitment and the financial, managerial and technical capacity to consistently comply with the NNSDWA and NNPDWR. In addition to the documentation required in §1603 (B), an application for a permit to construct a new public water system shall include a management plan and a multi-year financial plan. These plans will not be required from new systems when their only source of water is an existing water system approved by the Director and the new system does not provide additional treatment to the water or sell the water. If the application proposes that the new system has its own source of water (i.e., its own well(s) or surface water treatment plant), the applicant shall evaluate the feasibility of connecting to an existing public water system as part of the demonstration of viability. This evaluation shall include, but not be limited to, a determination of the willingness and ability of an existing system to serve the project, water quality, capital cost of constructing the line extension versus constructing a new source and the operation and maintenance costs of both alternatives. Any cost comparisons between creating a new water system with its own source of water and connecting to an existing water system shall not be based on any subsidized monitoring. Also any financing of the new system shall not utilize a loan amortization schedule which exceeds the useful life of the facility or its components. This demonstration of viability may be included in the engineering report when applying for a permit to construct.

D. For projects involving a surface water discharge of water treatment residuals or wastewater, a

National Pollutant Discharge Elimination System (NPDES) permit must be obtained from the NNEPA/NPDES Permit Program or from U.S. EPA Region 9, if NNEPA does not yet have an approved NPDES program. For projects involving land application of water treatment residuals or wastewater, a No Discharge (ND) permit must be obtained from the NNEPA or U.S. EPA, as the case may be. No construction permit can be issued for such projects until a valid NPDES or ND permit is obtained.

§1604 PERMIT ISSUANCE

A. The Director will review the permit application for completeness and will issue the construction permit pursuant to the permitting provisions in subpart 2 of the Uniform Rules.

B. A construction permit shall be valid for three years from the date of issuance, unless a permit extension is obtained.

C. A construction permit will become void if:

1. Construction does not begin within one year after the date the Construction Permit is issued; or

2. There is a halt in construction of more than one year; or

3. Construction is not completed within three years after the date construction begins, unless a permit extension is obtained. The professional engineer of record for the project must apply for the permit extension.

D. A permit extension must be applied for at least fifteen (15) days prior to expiration of the construction permit. If a permit extension is not obtained from the Director within thirty (30) days after the expiration of the construction permit, then all construction must terminate until further notice from the Director.

E. A permit to construct may be denied when:

1. The project does not comply with the minimum design regulations specified in the NNPDWR;

2. The water quality fails to comply with the drinking water standards specified in the NNPDWR; or

3. The owner of a proposed new system fails to prove to the Director's satisfaction that the system will be a "viable water system" as defined in §1603 (C).

F. Any deviation from the plans and specifications approved by the PWSSP which could potentially affect capacity, hydraulic conditions, operating units, functioning of water treatment process, or the quality of water to be delivered is grounds for revocation of the permit pursuant to § 204 of the Uniform Rules, unless a permit modification is obtained pursuant to that section. Minor revisions not affecting water quality, capacity, flow, sanitary features or performance will be permitted during construction without further approval, provided as-built plans documenting these changes are submitted to the Director as required.

§1605 EXCEPTIONS FROM PERMITTING REQUIREMENTS

A. Piping associated with a service connection will not require a construction permit if the following conditions are met:

1. All piping associated with the connection is dedicated strictly for use by a single customer being served water;

2. The customer consists of only a single house, single mobile home or single building; and

3. The customer is not a shopping mall or multiple building complex.

B. The following regular operation and maintenance procedures will not require permits:

1. Pipeline leak repair;

2. Replacement of existing deteriorated pipeline where the new pipeline segment is the same size as the old pipeline;

3. Entry into a drinking water storage facility for the purposes of cleaning and maintenance; and,

4. Replacement of equipment or pipeline appurtenances with the same type, size and rated

capacity (fire hydrants, valves, pressure regulators, meters, service laterals, chemical feeders and booster pumps including deep well pumps).

§1606 CONSTRUCTION PLANS

A. Construction plans shall be dated, shall carry the seal and signature of a professional engineer and, where applicable, shall provide the following:

1. General layout drawn to scale on plan sheets no larger than thirty (30) inches by forty-two (42) inches, including:

   a. suitable title;

   b. name of utility or owner;

   c. area or institution to be served;

   d. scale, in feet;

   e. north reference point;

   f. any physical or political boundaries within the area to be served including utility easements;

   g. sufficient number of elevations (Mean Sea Level) to characterize terrain in the area;

   h. address and name of the professional engineer responsible for the design;

   i. legible prints;

   j. location and size of existing water mains;

   k. location and nature of existing water works structures and appurtenances affecting the proposed improvements, noted on one sheet;

   l. for water systems supplied by wells, the location of all existing wells within the system; and,

   m. site location map.

2. Detailed plans, including:

   a. Construction drawings of distribution system drawn to a scale of no smaller than one inch to four hundred feet (1in : 400 ft) showing location of all appurtenances referenced to fixed above-ground objects, including size, length, identity, and location of sewers, drains, water mains, plant structures, and petroleum storage facilities, and, for new well projects any other pollution source. The Director may grant a variance to the 400 feet/inch scale on a case by case basis if the drawings adequately show all necessary physical features mentioned in this item;

   b. Profiles including hydraulic gradients for lines six (6) inches and larger in diameter having a horizontal scale of not more than one hundred (100) feet to the inch and a vertical scale of not more than ten (10) feet to the inch, with both scales clearly indicated. Profiles for lines smaller in diameter may be submitted at the discretion of the engineer or upon request by the Director;

   c. Stream crossings, providing profiles with elevations (MSL) of the stream bed and the normal and extreme high and low water levels

   d. Schematic drawing of proposed well construction, showing diameter and depth of drill hole(s), casing diameters and depths, grouting depths, elevations and designations of geological formations, water levels, screen lengths, gravel packing and other details to describe the proposed well completely;

   e. Drawing(s) of wellhead construction showing the concrete pad, sanitary seal, screened vent, check valve, pressure gauge, flow meter, blowoff, sample tap, gate valve(s), air line and gauge for measuring water level in the well, protective cover for wellhead, and well identification plate;

   f. Topography and arrangement of present or planned wells or structures, with appropriate contour interval to show runoff directions clearly (not greater than two feet in a

relatively flat area) for a minimum one hundred (100) foot radius;

g. Elevation drawings of structures showing the one hundred (100) year flood plain (MSL), or the highest flood elevation if the 100-year flood plain has not been defined, and elevations of floor, bottom, overflows, etc. within the structure;

h. Location and size of property to be used for groundwater development with respect to known references;

i. Location of pollution sources found in the wellhead/watershed protection area inventory as per Part XVII of the NNPDWR;

j. Schematic flow diagrams and hydraulic profiles showing flow through various plant units drawn on plan sheets the same size as the construction drawings;

k. Location, dimensions, and elevations of all proposed plant facilities;

l. Location of all plant piping in sufficient detail to show flow through plant including waste lines;

m. Location of all chemical feeding equipment, points of application, and sample taps following chemical injection points;

n. Location of sanitary or other facilities, such as lavatories, showers, toilets, lockers, etc.;

o. All appurtenances, specific structures, and equipment pertinent to the project, such as water plant structures (air relief valves, altitude valves, blowoffs, hydrants, service connections, etc.);

p. Erosion control structures for wellhead blowoff and elevated and ground storage tank drains;

q. Adequately detailed drawing of any feature or piece of equipment not otherwise covered or adequately described by the specifications; and,

r. Protection of the water source, structures, and appurtenances, to include, but not be limited to, fencing, protective housing, or comparable form of security.

§1607 SPECIFICATIONS

A. The title page or cover of the specifications must carry the seal and signature of a professional engineer. Complete, detailed, technical specifications shall be supplied for each proposed project, and shall include, but not be limited to, the following:

1. Construction specifications, including:

   a. A detailed written program for maintaining normal operation of existing facilities during construction with minimal interruption of service;

   b. Laying methods and conditions including depth of cover, type of bedding and reaction blocking, and special structural details for water lines installed under storm drains;

   c. Pressure and leakage test procedures for new water mains including method of determining maximum allowable leakage;

   d. Disinfection procedure for all new or affected water system components to include disinfectant, dosage, contact time, and method for testing the results of the procedure;

   e. Well construction method and procedure;

   f. Chlorination room construction; and

   g. Other chemical feeding facilities construction.

2. Material specifications, including:

   a. Laboratory facilities and equipment, including sampling taps and their location;

   b. Number and design of chemical feeding equipment including make and model, if

available;

c. Equipment for sanitary or other facilities including any necessary backflow or back-siphonage protection;

d. Water main and appurtenances schedule and class, including approval status by testing and certification organizations;

e. Make, model, horsepower and performance curves of all pumping equipment; and

f. Paint coatings.

3. Testing and development procedure for new sources.

B. Standard Specifications:

If a water system or professional engineering firm uses a set of its own standard specifications, such specifications may be submitted to the Director, in duplicate, for approval. Following this approval, no specifications will be required on future project submittals as long as no changes are made. If there are any additions, deletions, or revisions to the approved standard specifications for a particular project submitted, the professional engineer shall either submit three (3) copies of an addendum to the standard specifications covering the changes only, or shall submit three (3) complete copies of specifications for the project in question. Each professional engineer that will be using a standard specification must place his seal and signature on the title page and must place his seal and signature on any revisions.

§1608 ENGINEERING REPORT

A. An engineering report explaining design criteria and calculations shall be submitted for each proposed project along with the application for the construction permit. The engineering report shall carry the seal and signature of a professional engineer and shall, where pertinent, present the following information:

1. General Information:

a. Name, address, phone number of owner, corporation, town or utility as well as name of responsible officer;

b. Name, address, phone number of engineering firm and name of engineer responsible for design;

c. General description of service area and surroundings (type of economy, estimated percent residential, estimated percent industrial, terrain, location, possible rate of development);

d. Number and type of customers to be served, (i.e., domestic, industrial, commercial, agricultural, etc.); and

e. Approval of any land use and development by the appropriate authority having jurisdiction.

2. General Design Data:

a. Pumping capacity of the source(s);

b. Average daily water consumption;

c. Number and type(s) of proposed service connections;

d. Fire flow requirements;

e. The results of a flow test conducted at a location near the proposed connection to the existing system. The results of this flow test shall include static pressure and residual pressure when a known flow, in excess of the demand for the proposed extension, is flowing. The time and date the flow test was conducted, the pipe size, type of pipe, elevation and distance between the test point and connection site shall also be included;

f. System pressures at maximum instantaneous demand or fire flow in addition to peak hourly flow, whichever is the worst case;

g. Details of hydraulic analyses and sizing of pipes and appurtenances;

h. Ground storage and transfer pump capacity;

i. System storage capacities; and

3. Ground Water Sources:

a. Location details including latitude and longitude of the well

b. Well record form

c. Ground profile

d. Casing material and size including details of well head

e. Details of pumping equipment

f. Results of pumping test

g. Results of physical, chemical, radiological and bacteriological analyses of raw water from a certified laboratory.

4. Surface Water Sources:

a. Location map including latitude and longitude of intake;

b. Name of source(s) and type (river, lake, etc.);

c. Watershed area;

d. Expected flow and the lowest flow of record of the source(s);

e. Name and type of discharges within ten (10) miles upstream (industrial, agricultural, municipal and other);

f. Distance from raw water supply to reservoir or plant; and

g. General description of intake and pump house.

5. Water Treatment Plants:

a. Projected maximum volume of water to be treated;

b. Year when plant is expected to operate at its maximum capacity;

c. If existing, present operating capacity;

d. Location map of plant;

e. Height above the one hundred (100) year flood plain based on the best information available;

f. Land available for future plant expansion;

g. Proposed treatment scheme shown in block diagram;

h. Proposed design criteria (retention times, velocities, weir overflow rates, filtration rates, etc.);

i. Description of proposed method of handling, treating, and disposing of wastewater from plant (includes clarification of sludge, filter backwash water, brines, etc.);

j. Name(s) and grade(s) of operator(s);

k. For modifications to existing treatment plant, report must include: Present capacity of raw water pumps, and a brief description of what effect proposed modification will have on existing facilities including velocities and retention times through plant; and

l. Detailed description of pilot testing to be performed, if any.

§1609 NOTIFICATION OF COMMENCEMENT OF CONSTRUCTION

The Director shall be notified at least seven days in advance of the beginning of construction on the site so that the Director may schedule an inspection. The Director may inspect the construction site any time to evaluate compliance with the approved plans and specifications, and shall be given access to the site for that purpose.

§1610 APPROVAL OF CONSTRUCTION

A. New facilities and substantial modifications to existing facilities shall not be placed into operation until written "approval of construction" is issued by the Director, unless a waiver of this requirement is issued by the Director. Upon completion of permitted construction, the professional engineer shall make arrangements with the Director for final inspection. Prior to this inspection, the professional engineer shall submit to the Director a letter certifying that construction is complete and in accordance with the approved plans and specifications. This letter must specifically identify the project by permit number. If the project was not completed in accordance with the approved plans and specifications, the professional engineer shall so state and shall outline any deviations to the permitted project. No written approval shall be issued to place a drinking water construction project into operation until written approval is obtained to place any associated wastewater construction into operation. In the absence of an appropriate NNEPA permit program for wastewater, the readiness of the wastewater construction to go into operation shall be deemed sufficient. The following information, where applicable, shall be submitted with the professional engineer's letter of certification:

1. Results of physical, chemical, radiological, and bacteriological analyses of new sources and/or treated water. These analyses shall be performed by a certified laboratory;

2. Results of bacteriological analyses following disinfection, including chlorine residuals at the time of collection. These analyses shall be performed by a certified laboratory;

3. Results of pressure/leakage test conducted on water lines;

4. As-built drawings of construction;

5. Completed Water Well Record form;

6. Geophysical/mechanical well logs;

7. Results of pumping test;

8. Paint coating(s) used for water storage tank(s);

9. Susceptibility assessment report showing wellhead/watershed protection area delineation along with the inventory of the potential sources of contamination to the well and the aquifer being utilized;

10. Proof of testing of all backflow prevention assemblies installed;

11. Letter of acceptance from organization responsible for operation and maintenance (must be the same as shown on the Application for Approval to Construct Drinking Water Facilities); and

12. Copies of any information specified as a special condition of a construction permit issued by the Director.

B. Failure to obtain written approval of construction from the Director prior to placing a new drinking water facility or a substantial modification to an existing facility into operation is a violation of the NNSDWA (Subchapter 7) and is subject to an enforcement action by the Director.

§1611 JUDICIAL REVIEW OF PERMIT DECISIONS

An applicant may appeal a final construction permit decision of the Director to the Navajo Nation Supreme Court, pursuant to §2586 of the NNSDWA.

PART XVII
WELLHEAD PROTECTION REGULATIONS

§ 1701 PURPOSE

This part provides for the establishment of a Wellhead Protection (WHP) Program, pursuant to NNSDWA § 2538, through which the PWSSP will assist Chapter governments and other communities in implementing measures to protect their drinking water supplies. Implementation of a public water systems WHP Plan may result in lowering the costs for communities to provide clean drinking water to the public by reducing the need to drill new wells and reducing the costs for treatment of drinking water. Information collected through a WHP Program may support requests for waivers from sampling requirements for certain chemicals, if there is no evidence of those chemicals in the water supply and the chemicals have not been used in the surrounding areas.

Developing a WHP Plan includes identifying the wellhead protection area and taking the necessary steps to safeguard the area from contaminants, for which the standards are set forth below. In addition to these standards, the PWSSP has developed a Navajo Nation Wellhead Protection Program guidance manual to assist public water system owners / operators and the communities in developing their own Wellhead Protection Programs. Copies are available from the PWSSP office.

§ 1702 APPLICABILITY

All public water systems using wells or springs within the jurisdiction of NNEPA as a source of supply of drinking water must complete a NNEPA form identifying all potential pollution sources within a one-mile radius of each well or springs. In addition, community water systems (excluding systems using purchased sources, or interties) that use wells or springs within NNEPA jurisdiction as a source of supply of drinking water must comply with the remainder of this part.

§ 1703 PRELIMINARY WELLHEAD PROTECTION REQUIREMENTS

Public water system owners and operators are required to complete a Susceptibility Assessment Form (Appendix H of the Navajo Nation Wellhead Protection Guidance Manual) for each well in the public water system. It is used to develop and implement a wellhead protection plan for the public water system to protect drinking water wells/springs from man-made contamination. It is also required for a Waiver Application.

§ 1704 WELLHEAD PROTECTION ELEMENTS

A. An effective Wellhead Protection Plan (WHPP) must contain, at a minimum, the following elements:

1. Specification of the duties of a public water system with respect to the development and implementation of a wellhead protection program;

2. Susceptibility Assessment Form(s);

3. Wellhead Protection Area (WHPA) delineation for each well, wellfield, or spring with the one, five and ten year time of travel boundaries marked, or boundaries established using alternate criteria approved by the PWSSP in those settings where ground water time of travel is not a reasonable delineation criteria. WHPA delineations shall be done in accordance with recognized methods such as those described in the following sources:

   a. Navajo Nation Wellhead Protection Guidance Manual, February 2003;

   b. EPA Guidelines for Delineation of Wellhead Protection Areas, EPA 440/6-87-010;

4. A list / inventory of all actual and potential ground water contaminant sources located within the delineated WHPA(s). This list must be updated every two years;

5. Documentation of the public water system owner's notification to all owners / operators of actual and potential sources of ground water contamination within the WHPA boundaries;

6. Documentation of the water system owner's notification to regulatory agencies and local chapter governments of the boundaries of the WHPA(s) and the findings of the WHPA inventory;

7. An Emergency Water Supply Plan (EWSP) to ensure consumers have an adequate supply of potable water in the event that contamination results in the temporary or permanent loss of the principal source of supply (major well(s) or wellfield). An EWSP is required pursuant to §2545 of the NNSDWA;

8. Before the operation of new water wells and springs, provide the PWSSP the following documentation:

   a. Susceptibility Assessment Form(s);

   b. A preliminary WHPA designation using the calculated fixed radius method, with the one, five, and ten year time of travel criteria;

   c. An initial inventory of potential sources of groundwater contamination located within the WHPA;

   d. A copy of the water well report including the Navajo Nation Tribal Well Identification number, depth to open interval or top of screened interval, overall depth of well, and location (both plat location and latitude / longitude);

   e. Well source development data establishing the capacity of the source. Data must include:

      1. Static water level;
      2. Wellhead elevation;
      3. Yield;
      4. The amount of drawdown;
      5. Recovery rate;
      6. Duration of pumping; and
      7. Interference between existing sources and the source being tested.

9. Documentation of coordination with local emergency responders (including police, fire and health departments), including notification of WHPA boundaries, results of susceptibility assessment, inventory findings, and EWSP; and

10. A WHP program that contains, as appropriate, technical assistance, financial assistance, implementation of control measures, education, training, and demonstration projects to protect the water supply within the WHPAs from such contaminants.

B. Geographic Information Systems (GIS) analysis or assessments consisting of a series of hydrogeologic and cultural overlay maps as given below, if available, shall be used to prioritize and determine aquifer susceptibility to potential contamination.

1. groundwater basin locations, geomorphic type, designated status;
2. geographic distribution of groundwater quantity data (availability, type of use, type of water supply);
3. population density and distribution;
4. land status and land use;
5. location of wells;
6. contour map of depth of water table;
7. contour map of total dissolved solids;
8. areas of impaired groundwater (natural and human-induced); and
9. actual and potential point sources of contamination (activities permitted or regulated by the Navajo Nation)

§1705 SENSITIVITY DETERMINATION

A. A sensitivity determination consists of examining the hydrogeologic characteristics of the source, groundwater quality, and the well's physical integrity. Based on the Susceptibility Assessment review, the groundwater source is determined to be either sensitive or non-sensitive based on the criteria discussed within the Navajo Nation Wellhead Protection Guidance Manual and the following:

1. A groundwater source will be determined non-sensitive by the PWSSP in its initial assessment, if all four of the following conditions exist:

   a. There is a hydrogeologic barrier of a minimum combined total of 50 feet of clay between, the surface and the top of the screened interval or perforated casing interval, or other identified protective layer;

   b. There is evidence that the 50-foot clay or other protective layer extends throughout the delineated area;

   c. No man-made contamination has been detected in the past three years; and

   d. The Susceptibility Assessment Form shows that the well has passed the physical integrity test.

If a PWS well does not meet one of the above-listed conditions, then its WHPA will be considered sensitive.

B. For those water sources that have been determined Groundwater under the Direct Influence of Surface Water (GWUDI) will be by default sensitive and vulnerable to potential contamination. These GWUDI sources will be delineated as surface water sources and include the delineated area around the well.

C. PWSSP will coordinate with Arizona, New Mexico, and Utah to share their water assessment results for water sources originating outside the Navajo Nation boundaries.

§1706 CRITERIA, THRESHOLDS AND DELINEATION METHODS

A. The delineation of a WHPA must be conservative; it must include the surface and subsurface area contributing water to the well. The goal is to provide protection to drinking water at the well from unexpected contaminant releases.

1. Public water systems with less than 1,000 connections.

   a. The Calculated Fixed Radius method is the minimum acceptable method of delineation.

2. Public water systems with 1,000 or more connections.

   a. The initial delineation must be the analytical or other more sophisticated groundwater flow method.

B. The criterion, threshold and method selected for delineating a WHPA must be appropriate for the hydrogeologic situation and additional consideration must be given if the inventory reveals the presence of high risk potential contaminant sources.

C. The Hydrologist shall evaluate the extent to which a hydrogeologic setting varies from a circular zone of contribution through the use of the Susceptibility Assessment form. The assessment shall determine if delineation methods other than the Calculated Fixed Radius methods are more appropriate:

1. For public water systems determined to have high susceptibility to contamination or its groundwater source sensitive.

   a. Initial delineation may be done using a Calculated Fixed Radius method, but must be upgraded using Analytical or other sophisticated, site specific methods, such as the numerical modeling and / or hydrogeologic mapping within two (2) years;

2. For public water systems having low to moderate susceptibility to contamination or its groundwater source non-sensitive:

   a. Initial delineation may be done using a Calculated Fixed Radius method, but must be upgraded to a more sophisticated delineation method within five (5) years;

C. All delineations for groundwater sources will be based on the 1, 5, and 10-year Time-of-Travel boundaries for defining the wellhead protection area(s). Inventory results will be presented based on occurrence in the 3 delineated subunits (0-1 yr., 1-5 yr., and 5-10 yr.,areas).

§1707 GUIDELINES FOR CONTAMINANT SOURCE INVENTORY

A. The PWSSP has developed a Potential Sources of Contamination (PSOC) survey form (Susceptibility Assessment Appendix F). This PSOC form is an aid to identify any potential sources of contaminants that may exist within rural or populous communities. At a minimum, the WHPP should identify, locate and include a map of the past, present, and proposed operations that may represent a future potential source of groundwater contamination. The WHPP must also identify and include a map of the current and proposed land use zoning designations.

B. Guidelines for conducting an inventory are given in the Navajo Nation Wellhead Protection Guidance Manual (February 2003).

C. The WHPP inventory list must be updated every two years.

§1708 NEW WELL SITING

A. All new water wells and related drilling must obtain drilling permits from the Navajo Nation Water Resources Management (NNWRM). Any construction or substantial modification of a public water system must be approved and permitted by the PWSSP pursuant to Part XVI of the NNPDWR.

Before a new or modified public water system well receives approval from the PWSSP:

1. A susceptibility assessment must be completed;
2. A wellhead protection area must be delineated; and
3. Potential sources of contamination of the water bearing zone (aquifer) utilized by the well, spring, or wellfield must be identified.

§1709 CONTINGENCY PLANNING

A. In the event that contamination results in the temporary or permanent loss of the principal source of supply (major well(s) or wellfield) an EWSP required under NNSDWA §2545 shall be developed to ensure consumers have an adequate supply of potable water. Refer to §2545 for requirements.

B. The water system owner / operator must provide a copy of the wellhead protection area boundaries, results of the susceptibility assessment, inventory findings, and EWSP to local emergency responders (e.g. police, fire departments), the Navajo Nation Department of Emergency Management, and the local health department, and any local emergency planning committee. They can then evaluate whether changes in emergency response measures are needed to better protect groundwater / drinking water quality within the wellhead protection area. Coordination with local emergency responders must be initiated within one (1) year of completing the wellhead protection area delineation.

§1710 PUBLIC PARTICIPATION

Public participation is crucial to wellhead protection of drinking water sources within the Navajo Nation. Local public participation is voluntary and may culminate in local zoning or other control programs to protect a drinking water source. The PWSSP functions as the primary contact agency for individuals, organizations, and municipalities seeking information on the Navajo Nation Wellhead Protection Program. A primary objective of the PWSSP is to educate water system owners, interested citizens, agency staff and elected officials on the importance of wellhead protection within the Navajo Nation.

A. Providing Information to the Public:

1. The PWSSP has primary responsibility for publicizing the Navajo Nation Environmental Protection Agency Wellhead Protection Program, although all of Navajo Nation's agencies must assume some responsibility for informing potentially affected communities and/or parties. The PWSSP will notify existing public water system owners/operators of the requirements of the wellhead protection program.

2. The water system owner or community is advised to make the findings of its protection efforts available to the public.

3. In all cases, copies of the updated wellhead protection reports must be provided to the PWSSP as part of the public record.

PART XVIII
SECONDARY DRINKING WATER STANDARDS

§ 1801 PURPOSE

This part establishes the Navajo Nation's Secondary Drinking Water Standards pursuant to § 2532 of the NNSDWA. These standards control contaminants in drinking water that primarily affect aesthetic qualities relating to public acceptance of drinking water. At considerably higher concentrations of these contaminants, health implications may exist as well as aesthetic degradation. These standards serve as a goal and are not enforceable by the NNEPA.

§ 1802 SECONDARY MAXIMUM CONTAMINANT LEVELS

The secondary maximum contaminant levels (SMCL) for public water systems are as follows:

TABLE 1800.1 Secondary Maximum Contaminant Level

CONTAMINANT	LEVEL
Aluminum	0.05 to 0.2 mg/L
Chloride	250 mg/L
Color	15 COLOR UNITS
Copper	1.0 mg/L
Corrosivity	Non-corrosive
Fluoride	2.0 mg/L
Foaming Agents	0.5 mg/L
Iron	0.3 mg/L
Manganese	0.05 mg/L
Odor	3 threshold odor number
pH	6.5-8.5
Silver	0.1 mg/L
Sulfate	250 mg/L
Total Dissolved Solids (TDS)	500 mg/L
Zinc	5 mg/L

§1803 ANALYTICAL METHODS

A. It is recommended that the parameters in these standards should be monitored at intervals no less frequent than the monitoring performed for inorganic chemical contaminants listed in the NNPDWR as applicable to CWSs. More frequent monitoring would be appropriate for specific parameters such as pH, color, odor, or others under certain circumstances as recommended by the Director.

B. Measurement of pH, copper and fluoride may be conducted with one of the methods in §402, Table 400.4. Analyses of aluminum, chloride, foaming agents, iron, manganese, odor, silver, sulfate, total dissolved solids (TDS) and zinc may be conducted with the methods in the following table. Criteria for analyzing aluminum, copper, iron, manganese, silver and zinc samples with digestion or directly without digestion, and other analytical test procedures are contained in *Technical Notes on Drinking Water Methods*, EPA-600/R-94-173, October 1994, which is available at NTIS PB95-104766.

Table 1800.2 METHODOLOGY

Contaminant	EPA	ASTM[3]	SM4	Other
Aluminum	[2]200.7		3120B	

	[2]200.8 [2]200.9		3113B 3111D	
Chloride	[1]300.0	D4327-91	4110 4500-Cl-D	
Color			2120B	
Foaming Agent			5540C	
Iron	[2]200.7 [2]200.9		3120B 3111B 3113B	
Manganese	[2]200.7 [2]200.8 [2]200.9		3120B 3111B 3113B	
Odor			2150B	
Silver	[2]200.7 [2]200.8 [2]200.9		3120B 3111B 3113B	I-3720-85[5]
Sulfate	[1]300.0 [1]375.2	D4327-91	4110 4500-SO_4-F 4500-SO_4-C, D	
TDS			2540C	
Zinc	[2]200.7 [2]200.8		3120B 3111B	

1. "*Methods for the Determination of Inorganic Substances in Environmental Samples*", EPA-600/R-93-100, August 1993. Available at NTIS, PB94-121811.

2. "*Methods for the Determination of Metals in Environmental Samples-Supplement I*", EPA-600/R-94-111, May 1994. Available at NTIS, PB94-184942.

3. The procedures shall be done in accordance with the *Annual Book of ASTM Standards*, 1994, Vols. 11.01 and 11.02, American Society for Testing and Materials. Copies may be obtained from the American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103. Copies may be inspected at EPA's Drinking Water Docket, 401 M Street SW, Washington, D.C. 20460; or at the Office of the Federal Register, 800 North Capitol Street, NW, Suite 700, Washington, D.C.

4. The procedures shall be done in accordance with the 18th edition, or latest edition, of Standard Methods for the Examination of Water and Wastewater, 1992. American Public Health Association. Copies may be obtained from the American Public Health Association, 1015 Fifteenth Street NW., Washington, D.C. 20005. Copies may be inspected at EPA's Drinking Water Docket, 401 M. Street, SW., Washington, DC 20460; or at the Office of the Federal Register, 800 North Capitol Street, NW., Suite 700, Washington, D.C.

5. Available from Books and Open-File Reports Section, USGS Federal Center, Box 25425, Denver, CO, 80225-0425.

§ 1804 COMPLIANCE WITH SECONDARY MAXIMUM CONTAMINANT LEVEL AND PUBLIC NOTIFICATION FOR FLUORIDE

A. CWSs, as defined in § 104 of these regulations, that exceed the SMCL for fluoride as determined by the last single sample taken in accordance with the requirements of § 406.1 of the NNPDWR, but not to exceed the MCL for fluoride as specified by § 204 of the NNPDWR, shall provide the notice described in subsection (B) of this section to all billing units annually, all new billing units at the time service begins, and the Director.

B. The notice required by subsection (A) of this section shall contain the following language, including the language necessary to replace the superscripts:

PUBLIC NOTICE

Dear User:

The Navajo Nation Environmental Protection Agency and the U.S. Environmental Protection Agency require that we send you this notice on the level of fluoride in your drinking water. The drinking

water in your community has a fluoride concentration of [1] milligrams per liter (mg/l).

Both the Navajo Nation Primary Drinking Water Drinking Regulations and federal regulations require that fluoride, which may occur naturally in your water supply, not exceed a concentration of 4.0 mg/l in drinking water. This is an enforceable standard called a Maximum Contaminant Level (MCL), and it has been established to protect the public health. Exposure to drinking water levels above 4.0 m/l for many years may result in some cases of crippling skeletal fluorosis, which is a serious bone disorder.

Both Navajo Nation and federal law also require that we notify you when sampling indicates that the fluoride in your drinking water exceeds 2.0 mg/l. This is intended to alert families about dental problems that might affect children under nine years of age. The fluoride concentration of your water exceeds this guideline.

Fluoride in children's drinking water at levels of approximately 1 mg/l reduces the number of dental cavities. However, some children exposed to levels of fluoride greater than about 2.0 mg/l may develop dental fluorosis. Dental fluorosis, in its moderate and severe forms, is a brown staining and/or pitting of the permanent teeth.

Because dental fluorosis occurs only when developing teeth (before they erupt from the gums) are exposed to elevated fluoride levels, households without children are not expected to be affected by this level of fluoride. Families with children under the age of nine are encouraged to seek other sources of drinking water for their children to avoid the possibility of staining and pitting.

Your water supplier can lower the concentration of fluoride in your water so that you will still receive the benefits of cavity prevention while the possibility of stained and pitted teeth is minimized. Removal of fluoride may increase your water costs. Treatment systems are also commercially available for home use. Information on such systems is available at the address given below. Low fluoride bottled drinking water that would meet all standards is also commercially available.

For further information, contact [2] at your water system.

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[1] PWS shall insert the compliance result which triggered notification under this part.

[2] PWS shall insert the name, address, and telephone number of a contact person at the PWS.

Part XIX
CONSECUTIVE PUBLIC WATER SYSTEMS

§ 1901 PURPOSE

This part identifies those public water systems which purchase water from a primary public water system and identifies the water sampling/analyses requirements for such systems.

§ 1902 APPLICABILITY

The Director shall determine whether a public water system is a consecutive public water system through a sanitary survey, and shall notify in writing the owner and/or operator of the consecutive public water system of this determination within 30 days of making the determination. The Director shall also identify all requirements with which the consecutive public water system must comply, consistent with the requirements for all CWSs (community water systems) and shall notify the owner and/or operator in writing of those requirements.

§ 1903 DEFINITION

A consecutive public water system purchases water from a primary public water system. The consecutive public water system distributes the water through its own distribution system.

§ 1904 COMPLIANCE REQUIREMENTS

A. Consecutive public water systems are required to operate and maintain their systems in a manner that ensures compliance with the NNSDWA and NNPDWR. Each consecutive public water system will be required to monitor for the following contaminants:

   1. Bacteriological and total coliform sampling pursuant to §404.

   2. Lead and Copper sampling pursuant to Part VII, §701 of these regulations.

   3. Asbestos sampling pursuant to §406, if the system uses asbestos cement pipe or if the Director determines that asbestos sampling is required.

B. Each consecutive public water system is required to comply with all other requirements consistent with the NNSDWA and NNPDWR, such as recordkeeping, reporting requirements, and operator certification.

C. Each consecutive public water system that is a community public water system must prepare a consumer confidence report pursuant to Part XII. Consecutive public water systems will need to request from the primary water purveyor a copy of the consumer confidence report and include the compliance/noncompliance information in their consumer confidence report.

Part XX
CROSS-CONNECTION CONTROL AND BACKFLOW PREVENTION

§2001 PURPOSE

This part outlines the requirements to protect the public water supply from the possibility of contamination through actual or potential cross-connections between public water systems and non-potable water systems due to backflow.

§2002 RESPONSIBILITY

Public water system owners and operators shall be responsible for protecting public water systems from backflow by complying with these regulations. These regulations shall not diminish the duty of owners and operators to comply with applicable statutes and regulations and industry standards and to provide adequate system design and performance.

§2003 CROSS-CONNECTION CONTROL HAZARD ASSESSMENT

A. To evaluate the potential for backflow into public water systems, each community water system shall conduct an initial field and/or office hazard assessment of the premises within its service area and each non-community water system shall conduct an initial field hazard assessment of its water distribution system. The hazard assessment shall consider:

   1. The existence of actual or potential cross-connections;

   2. The type and use of materials handled; and

   3. The degree of piping system complexity and accessibility.

B. Subsequent to the initial hazard assessment described in §2003 (A), the community water system shall:

   1. Conduct an assessment of the premises of each new water user connected to the public water system; and

   2. Re-evaluate the premises of an existing water user if changes within the water user's premises or any backflow incidents occur.

C. Subsequent to the initial hazard assessment described in §2003 (A), the non-community water system shall re-evaluate its water distribution system if any changes or any backflow incidents occur.

D. Each hazard assessment shall be performed by a person who is currently certified as a cross-connection control program specialist by the California-Nevada Section of the American Water Works Association or an organization with equivalent certification requirements acceptable to the Director, unless the Director approves an alternative person based on its review of system size, types of water users, treatment, distribution system, and any previous hazard assessment.

§2004 SELECTION OF THE TYPE OF BACKFLOW PROTECTION

A. Based on the results of the hazard assessment conducted pursuant to §2003, the public water system owner or operator shall ensure that the minimum backflow protection, if any, required pursuant to Table 2000.1 is installed. A community water system shall ensure that the protection is installed at the water user's service connection. A non-community water system shall ensure that protection is installed in the distribution system.

   1. The types of backflow protection that may be used are listed according to increasing level of protection as follows: *Pressure vacuum breaker assembly*, *Double check valve assembly*, *Reduced pressure principle assembly*, and *Air gap separation*. For roadway right-of-way irrigation systems where there is no potential for backpressure, a pressure vacuum breaker assembly shall be considered more protective than a double check valve assembly.

   2. If more than one of the hazard criteria listed in Table 2000.1 applies to the premises of a water user, the greatest degree of protection required by the criteria shall be installed.

B. If permitted as indicated in Table 2000.1, the public water system owner or operator may allow protection at one level lower than specified in Table 2000.1, subject to the Director's approval based on a review that includes the hazard involved, the public water system's cross-connection control program, the rationale and justification for proposing the lower level of protection,

and the public water system's compliance history related to cross-connection control.

C. If an assessment of a premise(s) could not be made pursuant to §2003 to determine the type of hazard present, the public water system owner or operator shall ensure that an air gap separation is installed.

D. If a hazardous situation exists on a water user's premises or in the public water system's distribution system that is not described in Table 2000.1, the public water system owner or operator shall consult with and obtain the concurrence of the PWSSP as to the appropriate type of backflow protection to be installed.

TABLE 2000.1 HAZARD CRITERIA AND APPROPRIATE TYPES OF BACKFLOW PROTECTION

Hazard	Required Level of Protection
1. Auxiliary Water Supplies	
A. Auxiliary supply that is interconnected with a piping system connected to the public water system (PWS)	Air gap separation[1]
B. Auxiliary supply that is not interconnected with a piping system connected to the PWS, but has piped water conveyed under pressure in a piping system less than 200 feet from the piping system connected to the PWS	Reduced pressure principle assembly[1]
2. Fire Protection Systems	
A. Fire protection system interconnected with a piping system connected to the PWS and an onsite auxiliary water supply for fire fighting	Air gap separation[1]
B. Fire protection system supplied by the PWS with an interconnection to onsite storage facilities and pumps, or combined fire and industrial water	Reduced pressure principle assembly[2]
3. Marina or port facilities	
A. Residential	Reduced pressure principle assembly[1]
B. Nonresidential	Reduced pressure principle assembly[2]
4. Premises with multiple service connections to the PWS	Reduced pressure principle assembly[1]
5. Recycled Water or Graywater	
A. Recycled water supply system that is:	
i. Interconnected to a piping system connected to PWS	Air gap separation[2]
ii. Not interconnected to a piping system connected to PWS	Reduced pressure principle assembly[2]
B. System that produces, or collects and distributes graywater and is:	
i. Interconnected to a piping system connected to the PWS	Air gap separation[2] Reduced pressure principle assembly[2]
ii. Not interconnected to a piping system connected to the PWS	
6. Sewage and Hazardous or Potentially Hazardous Substances	
A. Waste water treatment processes, handling and/or pumping equipment interconnected to a piping system connected to the PWS	Air gap separation[2]
B. Waste water treatment processes, handling and/or pumping equipment not interconnected to a piping system connected to the PWS, except for a single-family residence that has a sewage lift pump	Air gap separation[1]
C. Premises handling a substance in any manner in which the substance may enter a piping system connected to the PWS	Air gap separation[1]
D. Recreational vehicle dump station that is not interconnected to a piping system connected to the PWS	Reduced pressure principle assembly[1]
E. Piped irrigation system interconnected to a piping system	Reduced pressure

	connected to the PWS, into which fertilizers, herbicides, or pesticides are, or are intended to be, injected into the irrigation water	principle assembly[2]
F.	Piping system conveying a fluid not from an approved water supply that is:	
1.	Interconnected to a piping system connected to the PWS	Air gap separation[1] Reduced pressure principle assembly[1]
2.	Not interconnected to a piping system connected to the PWS	
7.	Roadway right-of-way irrigation system interconnected to a piping system connected to the PWS, and there is no potential for back pressure	Pressure vacuum breaker assembly[1]
8.	Water storage facility not under control of the PWS	Air gap separation[1]

[1]The public water system owner or operator may allow protection at one level lower than that designated, pursuant to §2004 (B).

[2]The public water system owner or operator shall not allow a lower level of protection than that designated.

§2005 STANDARDS FOR TYPES OF BACKFLOW PROTECTION

A. The public water system owner or operator shall ensure that each air-gap separation meets the requirements in section 603.2.1 of the Uniform Plumbing Code.

B. The public water system owner or operator shall ensure that each installed pressure vacuum breaker, double check valve, and reduced pressure principle backflow prevention assembly:

1. Meets the requirements in this part;

2. Meets the applicable American Water Works Standards, as follows:

a. C512 - Air Release, Air/Vacuum, and Combination Air Valves for Waterworks Service;
b. C511 - Reduced Pressure Principle Backflow Prevention Assembly; or
c. C510 - Double Check Valve Backflow Prevention Assembly; and

3. Is approved through laboratory and field evaluation tests performed by the Foundation for Cross-Connection Control and Hydraulic Research (University of Southern California, Kaprielian Hall 200, Los Angeles, CA 90089-2531; http://www.usc.edu/fccchr/) or an entity with equivalent testing requirements acceptable to the Director..

§2006 INSTALLATION CRITERIA FOR BACKFLOW PROTECTION

A. For air-gaps, the following shall apply:

1. The receiving water container shall be located on the water user's premises at the water user's service connection unless an alternate location has been approved by the public water system owner or operator in consultation and concurrence of the PWSSP.

2. A11 piping between the water user's service connection and the discharge location of the receiving water container shall be above finished grade and be accessible for visual inspection unless an alternative piping configuration is approved by the public water system owner or operator in consultation and concurrence of the PWSSP.

B. A reduced pressure principle backflow prevention assembly shall be installed such that the lowest point of the assembly is a minimum of twelve inches, and a maximum of 36 inches, above finished grade, unless an alternative is approved by the public water system owner or operator in consultation and concurrence of the PWSSP.

C. A pressure vacuum breaker assembly shall be installed a minimum of twelve inches above all downstream piping.

D. A reduced pressure principle or double check valve backflow prevention assembly shall have a minimum side clearance of twelve inches, except that a minimum side clearance of 24 inches shall be provided on the side of the assembly that contains the test cocks.

E. Backflow protection shall be located at the water user's service connection unless one or more alternative locations have been approved by the public water system owner or operator in consultation and concurrence of the PWSSP. The public water system owner or operator shall obtain access to the water user's premises and shall ensure that the on-site protection meets the standards specified in §2005 and the requirements of this part for installation, testing and

inspections.

F. Each backflow prevention assembly and air gap separation shall be accessible for field testing and maintenance.

§2007 FIELD TESTING AND REPAIR OF BACKFLOW PREVENTION ASSEMBLIES, AND AIR GAP INSPECTION

A. The public water system owner or operator shall require that all backflow prevention assemblies installed pursuant to this part be field tested following installation, repair, or relocation and at least annually thereafter. All required field testing shall be performed by persons who are currently certified in the testing of backflow prevention assemblies by California-Nevada Section of the American Water Works Association, the American Backflow Prevention Association, or an organization with equivalent certification requirements acceptable to the Director and have obtained a registration number from the Director. A registration number can be obtained through application to the PWSSP. An application fee, as determined by the Director, shall be charged for the registration number.

B. Air-gap separations installed pursuant to §2005 (A) and §2006 (A) shall be visually inspected by the public water system owner or operator at least annually to determine compliance with these regulations.

C. The public water system owner or operator shall ensure that backflow prevention assemblies that fail the field test are repaired or replaced within 30 days.

§2008 ADDITIONAL CROSS-CONNECTION CONTROL REQUIREMENTS FOR COMMUNITY WATER SYSTEMS

In addition to the applicable requirements in this part of the regulations, each community water system shall implement a cross-connection control program that includes operating rules of service or ordinances adopted to enable the public water system owner or operator to:

A. Comply with the requirements of these regulations, and

B. Discontinue a water user's service if the requirements in these regulations are not met.

§2009 RECORDKEEPING

A. Each public water system owner or operator shall maintain records of the following for a minimum of three years:

1. Most current hazard assessment, conducted pursuant to §2003;

2. Locations and types of backflow protection and associated hazards;

3. Results of all backflow prevention assembly field testing and air gap inspections; and

4. Repairs made to, or replacement or relocation of, backflow protection.

B. Each public water system owner or operator shall submit summaries of the information in §2009 (A) to the Navajo Nation Public Water Systems Supervision Program at the end of each calendar year. The summaries shall also be available to the Director on request for a minimum of three years.

§2010 NOTIFICATION

Each public water system owner or operator shall notify the Navajo Nation Public Water Systems Supervision Program of any known incident of backflow into the public water system within 24 hours of discovery of the incident. The public water system owner or operator shall also submit, within 5 working days, a written report of the incident describing the nature and severity of the backflow, the actions taken by the public water system owner or operator in response to the incident, and the action plan intended to prevent such incidents in the future.

Part XXI—Enhanced Filtration and Disinfection

§ 2101 General Requirements

A. These regulations establish requirements for filtration and disinfection that are in addition to Part VIII (Surface Water Treatment) for systems serving fewer than 10,000 people. The regulations in this part establish or extend treatment technique requirements in lieu of maximum contaminant levels (MCLs) for the following contaminants: *Giardia lamblia,* viruses, heterotrophic plate count bacteria, *Legionella, Cryptosporidium* and turbidity. The treatment technique requirements consist of installing and properly operating water treatment processes which reliably achieve:

1. At least 99 percent (2 log) removal of *Cryptosporidium* between a point where the raw water is not subject to re-contamination by surface water runoff and a point downstream before or at the first customer for filtered systems, or *Cryptosporidium* control under the watershed control plan for unfiltered systems; and

2. Compliance with the profiling and benchmark requirements in §§ 2104(A) through 2105(C).

B. Applicability

1. Compliance with this section is required if a system:

   a. Is a public water system;

   b. Uses surface water or GWUDI as a source; and profile as described in §§ 2102(A) and (B);

   c. Serves fewer than 10,000 persons.

C. Compliance dates.

Part XXI systems must comply with these regulations beginning January 14, 2005 except where otherwise noted.

D. Requirements

1. Any finished water reservoir must be covered. These regulations apply to any public water system project constructed on or after March 15, 2002 as described in §§2102 (A) and (B);

2. If the public water system is an unfiltered system, owners/operators must comply with the updated watershed control requirements described in §§2103 (A), (B), and (C).

3. If the public water system is a community or non-transient non-community water system, owners/operators must develop a disinfection profile as described in §§2104 (A-G)

4. If the public water system is considering making a significant change to its disinfection practices, owners/operators must develop a disinfection benchmark and consult with the Director for approval of the change as described in §§ 2105(A-E);

5. If the public water system is a filtered system, owners/operators must comply with the combined filter effluent requirements as described in §§2106(A)-(D);

6. If the public water system is a filtered system that uses conventional or direct filtration, owners/operators must comply with the individual filter turbidity requirements as described in §§ 2107(A-E), and;

7. Owners/operators must comply with the applicable reporting and recordkeeping requirements as described in §§ 2108(A) and (B).

§ 2102 Finished Water Reservoirs

A. All Part VIII systems which serve fewer than 10,000 are subject to this requirement.

B. Requirements for new finished water reservoirs

If the public water system begins construction of a finished water reservoir on or after March 15, 2002 the reservoir must be covered. Finished water reservoirs for which public water systems began construction prior to March 15, 2002 are not subject to this requirement.

§ 2103 Additional Watershed Control Requirements for Unfiltered Systems

A. If the public water system is a Part VIII system serving fewer than 10,000 persons which does not provide filtration, owners/operators must continue to comply with all of the filtration avoidance criteria in § 803, as well as the additional watershed control requirements in § 2103(B).

B. Updated watershed control requirements for unfiltered systems to continue to avoid filtration

1. Owners/operators must take any additional steps necessary to minimize the potential for contamination by *Cryptosporidium* oocysts in the source water. A public water system's watershed control program must, for *Cryptosporidium*:

a. Identify watershed characteristics and activities which may have an adverse effect on source water quality; and

b. Monitor the occurrence of activities which may have an adverse effect on source water quality.

C. Director determination of watershed control requirements

During an onsite inspection conducted under the provisions of § 803(B)(3), the Director must determine whether public water system watershed control program is adequate to limit potential contamination by *Cryptosporidium* oocysts. The adequacy of the program must be based on the comprehensiveness of the watershed review; the effectiveness of owner's/operator's program to monitor and control detrimental activities occurring in the watershed; and the extent to which the owner/operator has maximized land ownership and/or controlled land use within the watershed.

§ 2104 Disinfection Profile

A. A disinfection profile is a graphical representation of the public water system's level of *Giardia lamblia* or virus inactivation measured during the course of a year. If the public water system is a Part VIII CWS or NTNCWS which serves fewer than 10,000 persons, owners/operators must develop a disinfection profile unless the Director determines that the public water system's profile is unnecessary. The Director may approve the use of a more representative data set for disinfection profiling than the data set required under §§ 2104 (C) - (G).

B. Criteria to determine that a profile is unnecessary

The Director may only determine that a system's profile is unnecessary if a system's TTHM and HAA5 levels are below 0.064 mg/L and 0.048 mg/L, respectively. To determine these levels, TTHM and HAA5 samples must be collected after January 1, 1998, during the month with the warmest water temperature, and at the point of maximum residence time in the public water system's distribution system.

C. Requirements for a Disinfection Profile

1. A disinfection profile consists of three steps:

a. The owner/operator must first collect data for several parameters from the plant as discussed in § 2104 (D) over the course of 12 months. If the public water system serves between 500 and 9,999 persons, owner/operator must begin to collect data no later than July 1, 2003. If the public water system serves fewer than 500 persons, the owner/operator must begin to collect data no later than January 1, 2004.

b. The owner/operator must then use this data to calculate weekly log inactivation as discussed in §§ 2104 (E) and (F); and

c. Next, the owner/operator must use these weekly log inactivations to develop a disinfection profile as specified in § 2104 (G).

D. Required data for a Disinfection Profile

1. Owners/operators must monitor the following parameters to determine the total log inactivation using the analytical methods in Appendix D 801-D, once per week on the same calendar day, over 12 consecutive months:

a. The temperature of the disinfected water at each residual disinfectant concentration sampling point during peak hourly flow;

b. If the owner/operator uses chlorine, the pH of the disinfected water at each residual disinfectant concentration sampling point during peak hourly flow;

c. The disinfectant contact time(s) ("T") during peak hourly flow; and

d. The residual disinfectant concentration(s) ("C") of the water before or at the first customer and prior to each additional point of disinfection during peak hourly flow.

E. Calculation of the inactivation ratio

Calculate the total inactivation ratio as follows, and multiply the value by 3.0 to determine log inactivation of *Giardia lamblia*:

Table 2100.1 Total Inactivation Calculation of *Giardia lamblia*

If the public water system	The owner/operator must determine
(a) Uses only one point of disinfectant application.	(1) One inactivation ratio ($CTcalc/CT_{99.9}$) before or at the first customer during peak hourly flow: or (2) Successive $CTcalc/CT_{99.9}$ values, representing sequential inactivation ratios, between the point of disinfectant application and a point before or at the first customer during peak hourly flow. Under this alternative, the owner/operator must calculate the total inactivation ratio by determining ($CTcalc/CT_{99.9}$) for each sequence and then adding the ($CTcalc/CT_{99.9}$) values together to determine ($3CTcalc/CT_{99.9}$).
(b) Uses more than one point of disinfectant application before the first customer.	The ($CTcalc/CT_{99.9}$) value of each disinfection segment immediately prior to the next point of disinfectant application, or for the final segment, before or at the first customer, during peak hourly flow using the procedure specified in paragraph (a)(2) of this section.

F. Requirements for systems using chloramines, ozone, or chlorine dioxide for primary disinfection

If the owner/operator uses chloramines, ozone, or chlorine dioxide for primary disinfection, the owner/operator must also calculate the logs of inactivation for viruses and develop an additional disinfection profile for viruses using methods approved by the Director.

G. Inactivation ratio reporting requirements.

Each log inactivation serves as a data point in the public water system disinfection profile. The owner/operator will have obtained 52 measurements (one for every week of the year). This will allow the owner/operator and the Director the opportunity to evaluate how microbial inactivation varied over the course of the year by looking at all 52 measurements (the Disinfection Profile). The owner/operator must retain the Disinfection Profile data in graphic form, such as a spreadsheet, which must be available for review by the Director as part of a sanitary survey. The owner/operator must use this data to calculate a benchmark if the owner/operator are considering changes to disinfection practices.

§ 2105 Disinfection Benchmark

A. If the public water system is a Part VIII system, the owners/operators are required to develop a disinfection profile under §§ 2104 (A) through (G). The owner/operator must develop a Disinfection Benchmark if the owner/operator decides to make a significant change to the public water system disinfection practice. Owners/operators must consult with the Director for approval before implementing a significant disinfection practice change.

B. Disinfection practices

1. Significant changes to disinfection practice include:

a. Changes to the point of disinfection;

b. Changes to the disinfectant(s) used in the treatment plant;

c. Changes to the disinfection process; or

d. Any other modification identified by the Director.

C. Requirements for significant changes to disinfection practices

1. If the owner/operator is considering a significant change to its disinfection practice, owners/operators must calculate a disinfection benchmark(s) as described in §§ 2105 (D)

and (E) and provide the benchmark(s) to the Director. Owners/operators may only make a significant disinfection practice change after consulting with the Director for approval. Owners/operators must submit the following information to the Director as part of the consultation and approval process:

a. A description of the proposed change;

b. The disinfection profile for *Giardia lamblia* (and, if necessary, viruses) and disinfection benchmark;

c. An analysis of how the proposed change will affect the current levels of disinfection; and

d. Any additional information requested by the Director.

D. Disinfection Benchmark Calculations

If owner/operator is making a significant change to its disinfection practice, the owner/operator must calculate a disinfection benchmark using the procedure specified below:

1. To calculate a disinfection benchmark owners/operator must perform the following steps

a. Step 1: Using the data that owners/operators collected to develop the Disinfection Profile, determine the average *Giardia lamblia* inactivation for each calendar month by dividing the sum of all *Giardia lamblia* inactivations for that month by the number of values calculated for that month.

b. Step 2: Determine the lowest monthly average value out of the twelve values. This value becomes the disinfection benchmark.

E. Requirements for public water systems using chloramines, ozone, or chlorine dioxide for primary disinfection

If the owner/operator uses chloramines, ozone or chlorine dioxide for primary disinfection, the owner/operator must calculate the disinfection benchmark from the data that the owner/operator collected for viruses to develop the disinfection profile in addition to the *Giardia lamblia* disinfection benchmark calculated under § 2105 (D). This viral benchmark must be calculated in the same manner used to calculate the *Giardia lamblia* disinfection benchmark in § 2105 (D).

§ 2106 Combined Filter Effluent Requirements

A. All Part VIII systems which serve populations fewer than 10,000, are required to filter, and utilize filtration other than slow sand filtration or diatomaceous earth filtration must meet the combined filter effluent turbidity requirements of §§2106 (B)-(D). If the owner/operator uses slow sand or diatomaceous earth filtration, owners/operators are not required to meet the combined filter effluent turbidity limits of this section, but owner/operator must continue to meet the combined filter effluent turbidity limits in § 805.

B. Requirements for strengthened combined filter effluent turbidity limits

1. Public water systems must meet two strengthened combined filter effluent turbidity limits.

a. The first combined filter effluent turbidity limit is a "95th percentile" turbidity limit that public water systems must meet in at least 95 percent of the turbidity measurements taken each month. Measurements must continue to be taken as described in Appendix D, 801-D (A) and (C). Monthly reporting must be completed according to § 2108 (A). The following table describes the required limits for specific filtration technologies.

Table 2100.2 Required Limits for Specific Filtration Technologies
95th Percentile

If the public water system consists of	The 95th percentile turbidity value is:
(1) Conventional Filtration or Direct Filtration	0.3 NTU
(2) All other "Alternative" Filtration	A value determined by the Director (not to exceed 1 NTU) based on the demonstration described in § 2106 (C).

b. The second combined filter effluent turbidity limit is a "maximum" turbidity limit which the public water system may at no time exceed during the month. Measurements must continue to be taken as described in Appendix D 801-D (A) and (C). Monthly reporting must be completed according to § 2108(A). The following table describes the required limits for specific filtration technologies.

Table 2100.3 Required Limits for Specific Filtration Technologies - Maximum Turbidity Limit

If the public water system consists of	The maximum turbidity value is:
(1) Conventional Filtration or Direct Filtration	1 NTU.
(2) All other "Alternative" Filtration	A value determined by the Director (not to exceed 5 NTU) based on the demonstration as described in § 2106 (C).

C. Requirements for "alternative filtration"

a. If the public water system consists of alternative filtration(filtration other than slow sand filtration, diatomaceous earth filtration, conventional filtration, or direct filtration), owners/operators are required to conduct a demonstration (see tables in § 2106 (B)(1)). Owners/operators must demonstrate to the Director, using pilot plant studies or other means, that the public water system's filtration, in combination with disinfection treatment, consistently achieves:

1. 99 percent removal of *Cryptosporidium* oocysts;

2. 99.9 percent removal and/or inactivation of *Giardia lamblia* cysts; and

3. 99.99 percent removal and/or inactivation of viruses.

b. [Reserved]

D. Requirements for lime softening

If lime softening is practiced, the owner/operator may acidify representative combined filter effluent turbidity samples prior to analysis using a protocol approved by the Director.

§ 2107 Individual Filter Turbidity Requirements

A. If the public water system is a Part VIII system serving fewer than 10,000 people and utilizing conventional filtration or direct filtration, the owner/operator must conduct continuous monitoring of turbidity for each individual filter at the public water system. The following requirements apply to continuous turbidity monitoring:

1. Monitoring must be conducted using an approved method in Appendix D 801-D (A);
2. Calibration of turbidimeters must be conducted using procedures specified by the manufacturer;
3. Results of turbidity monitoring must be recorded at least every 15 minutes;
4. Monthly reporting must be completed according to § 2108(A); and
5. Records must be maintained according to § 2108(B).

B. Requirements for turbidity monitoring if equipment fails

If there is a failure in the continuous turbidity monitoring equipment, the owner/operator must conduct grab sampling every four hours in lieu of continuous monitoring until the turbidimeter is back on-line. The owner/operator has 14 days to resume continuous monitoring before a violation is incurred.

C. Special provisions regarding individual filter turbidity monitoring

If the public water system only consists of two or fewer filters, the owner/operator may conduct continuous monitoring of combined filter effluent turbidity in lieu of individual filter effluent turbidity monitoring. Continuous monitoring must meet the same requirements set forth in § 2107 (A) (1) through (5) and (B).

D. Requirements for continuous turbidity monitoring

Follow-up action is required according to the following tables:

Table 2100.4 Requirements for Continuous Turbidity Monitoring

If	Owners/operators must
(a) The turbidity of an individual filter (or the turbidity of combined filter effluent (CFE) for systems with 2 filters that monitor CFE in lieu of individual filters) exceeds 1.0 NTU in two consecutive recordings 15 minutes apart.	Report to the Director by the 10th of the following month and include the filter number(s), corresponding date(s), turbidity value(s) which exceeded 1.0 NTU, and the cause (if known) for the exceedance(s).

Table 2100.5 Requirements for Continuous Turbidity Monitoring - Reporting

If a public water system was required to report to the Director	Owners/operators must
(b) For three months in a row and turbidity exceeded 1.0 NTU in two consecutive recordings 15 minutes apart at the same filter (or CFE for systems with 2 filters that monitor CFE in lieu of individual filters).	Conduct a self-assessment of the filter(s) within 14 days of the day the filter exceeded 1.0 NTU in two consecutive measurements for the third straight month unless a CPE as specified in paragraph (c) of this section was required. Systems with 2 filters that monitor CFE in lieu of individual filters must conduct a self assessment on both filters. The self-assessment must consist of at least the following components: assessment of filter performance; development of a filter profile; identification and prioritization of factors limiting filter performance; assessment of the applicability of corrections; and preparation of a filter self-assessment report. If a self-assessment is required, the date that it was triggered and the date that it was completed.
(c) For two months in a row and turbidity exceeded 2.0 BTU in 2 consecutive recordings 15 minutes apart at the same filter (or CFE for systems with 2 filters that monitor CFE in lieu of individual filters).	Arrange to have a comprehensive performance evaluation (CPE) conducted by the Director not later than 60 days following the day the filter exceeded 2.0 NTU in two consecutive measurements for the second straight month. If a CPE has been completed by the Director within the 12 prior months or the system and Director are jointly participating in an ongoing Comprehensive Technical Assistance (CTA) project at the system, a new CPE is not required. If conducted, a CPE must be completed and submitted to the Director no later than 120 days following the day the filter exceeded 2.0 NTU in two consecutive measurements for the second straight month.

E. Requirements for lime softening practices for individual filter turbidity monitoring

If the public water system utilizes lime softening, the owner/operator may apply to the Director for alternative turbidity exceedance levels for the levels specified in the table in § 2107 (D). Owners/operators must be able to demonstrate to the Director that higher turbidity levels are due to lime carryover only, and not due to degraded filter performance.

§ 2108 Reporting and Recordkeeping Requirements

A. This section requires owners/operators to report several items to the Director. The following table describes the items which must be reported and the frequency of reporting. Owners/operators are required to report the information described in the following table, if it is subject to the specific requirement shown in the first column.

Table 2100.6 Reporting Requirements

Corresponding requirement	Description of information to report	Frequency
(a) Combined Filter Effluent Requirements. (§§ 2106 (A)-(D))	(1) The total number of filtered water turbidity measurements taken during the	By the 10th of the following month.

	month. (2) The number and percentage of filtered water turbidity measurements taken during the month which are less than or equal to the public water system's required 95th percentile limit. (3) The date and value of any turbidity measurements taken during the month which exceed the maximum turbidity value for the public water system's filtration system.	By the 10th of the following month. By the 10th of the following month.
(b) Individual Turbidity Requirements. (§§ 2107 (A)-(E))	(1) That the owner/operator conducted individual filter turbidity monitoring during the month. (2) The filter number(s), corresponding date(s), and the turbidity value(s) which exceeded 1.0 NTU during the month, but only if 2 consecutive measurements exceeded 1.0 NTU. (3) If a self-assessment is required, the date that it was triggered and the date that it was completed. (4) If a CPE is required, that the CPE is required and the date that it was triggered. (5) Copy of completed CPE report.	By the 10th of the following month. By the 10th of the following month. By the 10th of the following month (or 14 days after the self-assessment was triggered only if the self-assessment was triggered during the last four days of the month) By the 10th of the following month. Within 120 days after the CPE was triggered.
(c) Disinfection Profiling (§§ 2104 (A)-(G))	(1) Results of optional monitoring which show TTHM levels <0.064 mg/l and HAA5 levels <0.048 mg/l (Only if owner/operator wishes to forgo profiling) or that the owner/operator has begun disinfection profiling.	(i) For systems serving 500-9,999 by July 1, 2003; (ii) For systems serving fewer than 500 by January 1, 2004.
(d) Disinfection Benchmarking (§§ 2105 (A)-(E))	(1) A description of the proposed change in disinfection, the public water system's disinfection profile for Giardia lamblia (and, if necessary, viruses) and disinfection benchmark, and an analysis of how the proposed change will affect the current levels of disinfection.	Anytime the owner/operator is considering a significant change to its disinfection practice.

B. Recordkeeping

Owners/operators must keep several types of records based on the requirements of this section, in addition to recordkeeping requirements under § 806. The following table describes the necessary records, the length of time these records must be kept, and for which requirement the records pertain. Owners/operators are required to maintain records described in this table, if it is subject to the specific requirement shown in the first column.

Table 2100.7 Recordkeeping Requirements

Corresponding requirement	Description of necessary records	Duration of time records must be kept

(a) Individual Filter Turbidity Requirements (§§ 2107 (A)-(E))	Results of individual filter monitoring	At least 3 years.
(b) Disinfection Profiling (§§ 2104(A)-(G))	Results of Profile (including raw data and analysis)	Indefinitely.
(c) Disinfection Benchmarking (§§ 2105 (A)-(E))	Benchmark (including raw data and analysis)	Indefinitely.

Part XXII
Initial Distribution System Evaluations

§2201 GENERAL REQUIREMENTS

A. The regulations in this part establish monitoring and other requirements for identifying Part XXIII compliance monitoring locations for determining compliance with maximum contaminant levels for total trihalomethanes (TTHM) and haloacetic acids (five) (HAA5). The public water system owner/operator must use an Initial Distribution System Evaluation (IDSE) to determine locations with representative high TTHM and HAA5 concentrations throughout the distribution system. IDSEs are used in conjunction with, but separate from, Part XI compliance monitoring, to identify and select Part XXIII compliance monitoring locations.

B. Applicability. An owner/operator is subject to these requirements if a system is a community water system that uses a primary or residual disinfectant other than ultraviolet light or delivers water that has been treated with a primary or residual disinfectant other than ultraviolet light; or if the system is a nontransient noncommunity water system that serves at least 10,000 people and uses a primary or residual disinfectant other than ultraviolet light or delivers water that has been treated with a primary or residual disinfectant other than ultraviolet light.

C. Schedule.

1. The owner/operator must comply with the requirements of this part according to the schedule in Table 2200.1.

Table 2200.1 SCHEDULE REQUIREMENTS by POPULATION and SYSTEM TYPE

If system serves this population	The public water system owner/operator must submit a standard monitoring plan or system specific study plan[1] or 40/30 certification[2] to the Director by or receive very small system waiver from Director	The public water system owner/operator must complete a standard monitoring or system specific study by	The public water system owner/operator must submit an IDSE report to the Director by[3]
Systems that are not part of a combined distribution system and systems that serve the largest population in the combined distribution system			
(a) ≥100,000....	October 1, 2006	September 30, 2008	January 1, 2009.
(b) 50,000-99,999	April 1, 2007	March 31, 2009	July 1, 2009.
(c) 10,000-49,999	October 1, 2007	September 30, 2009	January 1, 2010.
(d) < 10,000 (CWS Only)	April 1, 2008	March 31, 2010	July 1, 2010
Other systems that are part of a combined distribution system			
(e) Wholesale system or consecutive system.	--at the same time as the system with the earliest compliance date in the combined distribution system.	--at the same time as the system with the earliest compliance date in the combined distribution system.	--at the same time as the system with the earliest compliance date in the combined distribution system.

[1]If, within 12 months after the date identified in this column, the Director does not approve the plan o: notify the system that it has not yet completed its review, the owner/operator may consider the plan that was submitted as approved. The owner/operator must implement that plan and complete standard monitoring or a system specific study no later than the date identified in the third column.
[2]The owner/operator must submit a 40/30 certification under § 2204 by the date indicated.
[3] If, within three months after the date identified in this column (nine months after the date identifie

in this column if the owner/operator must comply on the schedule in paragraph (C)(1)(c) of this section), the Director does not approve the IDSE report or notify the owner/operator that it has not yet completed its review, the owner/operator may consider the report that was submitted as approved and the owner/operator must implement the recommended Part XXIII monitoring as required.

2. For the purpose of the schedule in paragraph (C)(1) of this section, the Director may determine that the combined distribution system does not include certain consecutive systems based on factors such as receiving water from a wholesale system only on an emergency basis or receiving only a small percentage and small volume of water from a wholesale system. The Director may also determine that the combined distribution system does not include certain wholesale systems based on factors such as delivering water to a consecutive system only on an emergency basis or delivering only a small percentage and small volume of water to a consecutive system.

D. The owner/operator must conduct standard monitoring that meets the requirements in § 2202, or a system specific study that meets the requirements in § 2203, or certify to the Director that the owner/operator meets the 40/30 certification criteria under § 2204, or qualifies for a very small system waiver under § 2205.

1. The owner/operator must have taken the full complement of routine TTHM and HAA5 compliance samples required of a system with the same population and source water under Part XI of these regulations (or the owner/operator must have taken the full complement of reduced TTHM and HAA5 compliance samples required of a system with the same population and source water under Part XI if the owner/operator meet reduced monitoring criteria under Part XI of these regulations) during the period specified in § 2204 (A) to meet the 40/30 certification criteria in § 2204. The owner/operator must have taken TTHM and HAA5 samples under Appendix E-1101-E and 1103 to be eligible for the very small system waiver in § 2205.

2. If the owner/operator has not taken the required samples, the owner/operator must conduct standard monitoring that meets the requirements in § 2202, or a system specific study that meets the requirements in § 2203.

E. The owner/operator must use only the analytical methods specified in Appendix E-1101-E, or otherwise approved by EPA for monitoring under this subpart, to demonstrate compliance with the requirements of this subpart.

F. IDSE results will not be used for the purpose of determining compliance with MCLs in § 207.

§2202 STANDARD MONITORING

A. Standard monitoring plan. The standard monitoring plan must comply with paragraphs (A)(1) through (A)(4) of this section. The owner/operator must prepare and submit a standard monitoring plan to the Director according to the schedule in § 2201 (C).

1. The standard monitoring plan must include a schematic of the distribution system (including distribution system entry points and their sources, and storage facilities), with notes indicating locations and dates of all projected standard monitoring, and all projected Part XI compliance monitoring.

2. The standard monitoring plan must include a justification of the standard monitoring location selection and a summary of data the owner/operator relied on to justify the standard monitoring location selection.

3. The standard monitoring plan must specify the population served and system type (Part VIII or ground water).

4. The owner/operator must retain a complete copy of the standard monitoring plan submitted under this subsection (A), including any Director modification of the standard monitoring plan, for as long as the owner/operator is required to retain an IDSE report under paragraph (C)(4) of this section.

B. Standard monitoring.

1. The owner/operator must monitor as indicated in Table 2200.2. The owner/operator must collect dual sample sets at each monitoring location. One sample in the dual sample set must be analyzed for TTHM. The other sample in the dual sample set must be analyzed for HAA5. The owner/operator must conduct one monitoring period during the peak historical month for TTHM levels or HAA5 levels or the month of warmest water temperature. The owner/operator must review available compliance, study, or operational data to determine the peak historical month for TTHM or HAA5 levels or warmest water temperature.

TABLE 2200.2 STANDARD MONITORING PERIODS, FREQUENCY, and LOCATION by POPULATION AND SYSTEM TYPE

Source water type	Population size category	Monitoring periods and frequency of sampling	Distribution system monitoring locations[1]				
			Total per monitoring period	Near entry points	Average residence time	High TTHM locations	High HAA5 locations
Part VIII	< 500 consecutive systems	one (during peak historical month)[2]	2	1	.....	1	
	< 500 non-consecutive systems	.....	2	.....	.....	1	1
	500-3,300 consecutive systems	four (every 90 days)...	2	1	.....	1	
	500-3,300 non-consecutive systems	.....	2	.....	.....	1	1
	3,301-9,999	.....	4	.....	1	2	1
	10,000-49,999	six (every 60 days)	8	1	2	3	2
	50,000-249,999	.....	16	3	4	5	4
	250,000-999,999	.....	24	4	6	8	6
	1,000,000-4,999,999	.....	32	6	8	10	8
	≥5,000,000	.....	40	8	10	12	10
Ground Water:	<500 consecutive systems	one (during peak historical month)[2]	2	1	.....	1	
	<500 non-consecutive systems	.....	2	.....	.....	1	1
	500-9,999	four(every 90 days)	2	.....	.....	1	1
	10,000-99,999	.....	6	1	1	2	2
	100,000-499,999	.....	8	1	1	3	3
	≥500,000	.....	12	2	2	4	4

[1]A dual sample set (i.e., a TTHM and an HAA5 sample) must be taken at each monitoring location during each monitoring period.

[2]The peak historical month is the month with the highest TTHM or HAA5 levels or the warmest water temperature.

2. The owner/operator must take samples at locations other than the existing Part XI monitoring locations. Monitoring locations must be distributed throughout the distribution system.

3. If the number of entry points to the distribution system is fewer than the specified number of entry point monitoring locations, excess entry point samples must be replaced equally at high TTHM and HAA5 locations. If there is an odd extra location number, the owner/operator must take a sample at a high TTHM location. If the number of entry points to the distribution system is more than the specified number of entry point monitoring locations, the owner/operator must take samples at entry points to the distribution system having the highest annual water flows.

4. Monitoring under this subsection (B) may not be reduced under the provisions of § 1902 and the Director may not reduce monitoring using the provisions of § 142.16(m).

C. IDSE report. The owner/operator's IDSE report must include the elements required in paragraphs (C)(1)

through (C)(4) of this section. The owner/operator must submit an IDSE report to the Director according to the schedule in § 2201 (C).

1. The IDSE report must include all TTHM and HAA5 analytical results from Part XI compliance monitoring and all standard monitoring conducted during the period of the IDSE as individual analytical results and LRAAs presented in a tabular or spreadsheet format acceptable to the Director. If changed from the standard monitoring plan submitted under subsection (A) of this section, the report must also include a schematic of the distribution system, the population served, and system type (Part VIII or ground water).

2. The IDSE report must include an explanation of any deviations from the approved standard monitoring plan.

3. The owner/operator must recommend and justify Part XXIII compliance monitoring locations and timing based on the protocol in § 2206.

4. The owner/operator must retain a complete copy of the IDSE report submitted under this section for 10 years after the date that the owner/operator submitted the report. If the Director modifies the Part XXIII monitoring requirements that the owner/operator recommended in the IDSE report or if the Director approves alternative monitoring locations, the owner/operator must keep a copy of the Director's notification on file for 10 years after the date of the Director's notification. The owner/operator must make the IDSE report and any Director notification available for review by the Director or the public.

§2203 SYSTEM SPECIFIC STUDIES

A. System specific study plan. The owner/operator's system specific study plan must be based on either existing monitoring results as required under paragraph (A)(1) of this section or modeling as required under paragraph (A)(2) of this section. The owner/operator must prepare and submit a system specific study plan to the Director according to the schedule in § 2201 (C).

1. Existing monitoring results. The owner/operator may comply by submitting monitoring results collected before the owner/operator is required to begin monitoring under §2201 (C). The monitoring results and analysis must meet the criteria in paragraphs (A)(1)(a) and (A)(1)(b) of this section.

   a. Minimum requirements.

      i. TTHM and HAA5 results must be based on samples collected and analyzed in accordance with Appendix E-1101-E. Samples must be collected no earlier than five years prior to the study plan submission date.

      ii. The monitoring locations and frequency must meet the conditions identified in this paragraph (A)(1)(a)(ii). Each location must be sampled once during the peak historical month for TTHM levels or HAA5 levels or the month of warmest water temperature for every 12 months of data submitted for that location. Monitoring results must include all Part XI compliance monitoring results plus additional monitoring results as necessary to meet minimum sample requirements.

TABLE 2200.3 SAMPLE REQUIREMENTS FOR TTHM and HAA5

System Type	Population size category	Number of monitoring locations	Number of samples	
			TTHM	HAA5
Part VIII:	< 500	3	3	3
	500-3,300	3	9	9
	3,301-9,999	6	36	36
	10,000-49,999	12	72	72
	50,000-249,999	24	144	144
	250,000-999,999	36	216	216
	1,000,000-4,999,999	48	288	288
	≥5,000,000	60	360	360
Ground Water:	< 500	3	3	3
	500-9,999	3	9	9
	10,000-99,999	12	48	48
	100,000-499,999	18	72	72
	≥500,000	24	96	96

a Reporting monitoring results. The owner/operator must report the information in this paragraph (A)(1)(b).

i. The owner/operator must report previously collected monitoring results and certify that the reported monitoring results include all compliance and non-compliance results generated during the period beginning with the first reported result and ending with the most recent Part XI results.

ii. The owner/operator must certify that the samples were representative of the entire distribution system and that treatment, and distribution system has not changed significantly since the samples were collected.

iii. The owner/operator's study monitoring plan must include a schematic of the distribution system (including distribution system entry points and their sources, and storage facilities) with notes indicating the locations and dates of all completed or planned system specific study monitoring.

iv. The system specific study plan must specify the population served and system type (Part VIII or ground water).

v. The owner/operator must retain a complete copy of the system specific study plan submitted under this paragraph (A)(1), including any Director modification of the system specific study plan, for as long as the owner/operator is required to retain an IDSE report under paragraph (B)(5) of this section.

vi. If the owner/operator submits previously collected data that fully meet the number of samples required under paragraph (A)(1)(a)(I) of this section and the Director rejects some of the data, the owner/operator must either conduct additional monitoring to replace rejected data on a schedule the Director approves or conduct standard monitoring under § 2202.

2. Modeling. The public water system owner/operator may comply through analysis of an extended period simulation hydraulic model. The extended period simulation hydraulic model and analysis must meet the criteria in this paragraph (A)(2).

a Minimum requirements.

i. The model must simulate 24 hour variation in demand and show a consistently repeating 24 hour pattern of residence time.

ii. The model must represent the criteria listed in paragraphs (A)(2)(a)(ii)(1) through (9) of this section
1. 75% of pipe volume;
2. 50% of pipe length;
3. All pressure zones;
4. All 12-inch diameter and larger pipes;
5. All 8-inch and larger pipes that connect pressure zones, influence zones from different sources, storage facilities, major demand areas, pumps, and control valves, or are known or expected to be significant conveyors of water;
6. All 6-inch and larger pipes that connect remote areas of a distribution system to the main portion of the system;
7. All storage facilities with standard operations represented in the model;
8. All active pump stations with controls represented in the model; and
9. All active control valves.

iii. The model must be calibrated, or have calibration plans, for the current configuration of the distribution system during the period of high TTHM formation potential. All storage facilities must be evaluated as part of the calibration process. All required calibration must be completed no later than 12 months after plan submission.

b Reporting modeling. The public water system specific study plan must include the information in this paragraph (A)(2)(b).

i. Tabular or spreadsheet data demonstrating that the model meets requirements in paragraph (A)(2)(a)(ii) of this section.

ii. A description of all calibration activities undertaken and, if calibration is complete, a graph of predicted tank levels versus measured tank levels for the storage facility with the highest residence time in each pressure zone, and a time series graph of the residence time at the longest residence time storage facility in the distribution system showing the predictions for the entire simulation period (i.e., from time zero until the time it takes for the model to reach a consistently repeating pattern of residence time).

iii. Model output showing preliminary 24 hour average residence time predictions throughout the distribution system.

iv. Timing and number of samples representative of the distribution system planned for at least one monitoring period of TTHM and HAA5 dual sample monitoring at a number of locations no less than would be required for the system under standard monitoring in § 2202 during the historical month of high TTHM. These samples must be taken at locations other than existing Part XI compliance monitoring locations.

v. Description of how all requirements will be completed no later than 12 months after the owner/operator submits a system specific study plan.

vi. Schematic of the distribution system (including distribution system entry points and their sources, and storage facilities), with notes indicating the locations and dates of all completed system specific study monitoring (if calibration is complete) and all Part XI compliance monitoring.

vii. Population served and system type (Part VIII or ground water).

viii. The owner/operator must retain a complete copy of the system specific study plan submitted under this paragraph (A)(2), including any Director modification of the system specific study plan, for as long as the owner/operator is required to retain an IDSE report under paragraph (B)(7) of this section.

c If the owner/operator submits a model that does not fully meet the requirements under paragraph (A)(2) of this section, the owner/operator must correct the deficiencies and respond to Director inquiries concerning the model. If the owner/operator fails to correct deficiencies or respond to inquiries to the Director's satisfaction, the owner/operator must conduct standard monitoring under § 2202.

B. IDSE report. The IDSE report must include the elements required in paragraphs (B)(1) through (B)(6) of this section. The owner/operator must submit the IDSE report according to the schedule in § 2201 (C).

1. The IDSE report must include all TTHM and HAA5 analytical results from Part XI compliance monitoring and all system specific study monitoring conducted during the period of the system specific study presented in a tabular or spreadsheet format acceptable to the Director. If changed from the system specific study plan submitted under subsection (A) of this section, an IDSE report must also include a schematic of the distribution system, the population served, and system type (Part VIII or ground water).

2. If the owner/operator used the modeling provision under paragraph (A)(2) of this section, the owner/operator must include final information for the elements described in paragraph (A)(2)(b) of this section, and a 24-hour time series graph of residence time for each Part XXIII compliance monitoring location selected.

3. The owner/operator must recommend and justify Part XXIII compliance monitoring locations and timing based on the protocol in § 2206.

4. The IDSE report must include an explanation of any deviations from the approved system specific study plan.

5. The IDSE report must include the basis (analytical and modeling results) and justification the owner/operator used to select the recommended Part XXIII monitoring locations.

6. The owner/operator may submit the IDSE report in lieu of the system specific study plan on the schedule identified in § 2201 (C) for submission of the system specific study plan if the owner/operator believes that it has the necessary information by the time that the system specific study plan is due. If the owner/operator elects this approach, the IDSE report must also include all information required under subsection (A) of this section.

7. The owner/operator must retain a complete copy of the IDSE report submitted under this section for 10 years after the date that the owner/operator submitted the IDSE report. If the Director modifies the Part XXIII monitoring requirements that the owner/operator recommended in the IDSE report or if the Director approves alternative monitoring locations, the owner/operator must keep a copy of the Director's notification on file for 10 years after the date of the Director's notification. The owner/operator must make the IDSE report and any Director notification available for review by the Director or the public.

§2204 40/30 CERTIFICATION

C. Eligibility. An owner/operator is eligible for 40/30 certification if its system had no TTHM or HAA5 monitoring violations under Part XI of these regulations and no individual sample exceeded 0.040 mg/L for TTHM or 0.030 mg/L for HAA5 during an eight consecutive calendar quarter period beginning no earlier than the date specified in this subsection (A).

TABLE 2200.4 40/30 CERTIFICATION ELIGIBILITY and DUE DATES for TTHM and HAA5

If your 40/30 certification is due	Then your eligibility for 40/30 certification is based on eight consecutive calendar quarters of Part XI compliance monitoring results beginning no earlier than[1]
(1) October 1, 2006.	January 2004.
(2) April 1, 2007	January 2004.
(3) October 1, 2007	January 2005.
(4) April 1, 2008	January 2005.

[1]Unless the public water system is on reduced monitoring under Part XI of this part and was not required to monitor during the specified period. If the owner/operator did not monitor during the specified period, the owner/operator must base its eligibility on compliance samples taken during the 12 months preceding the specified period.

D. 40/30 certification.

1. The owner/operator must certify to the Director that every individual compliance sample taken under Part XI of these regulations during the periods specified in subsection (A) of this section were ≤0.040 mg/L for TTHM and ≤0.030 mg/L for HAA5, and that the public water system has not had any TTHM or HAA5 monitoring violations during the period specified in subsection (A) of this section.

2. The Director may require the owner/operator to submit compliance monitoring results, distribution system schematics, and/or recommended Part XXIII compliance monitoring locations in addition to the certification. If the owner/operator fails to submit the requested

information, the Director may require standard monitoring under § 2202 or a system specific study under § 2203.

3. The Director may still require standard monitoring under § 2202 or a system specific study under § 2203 even if the owner/operator meets the criteria in subsection (A) of this section.

4. The owner/operator must retain a complete copy of the certification submitted under this section for 10 years after the date that the owner/operator submitted the certification. The owner/operator must make the certification, all data upon which the certification is based, and any Director notification available for review by the Director or the public.

§2205 VERY SMALL SYSTEM WAIVERS

E. If the public water system serves fewer than 500 people and the owner/operator has taken TTHM and HAA5 samples under Part XI of these regulations, the owner/operator is not required to comply with this Part unless the Director notifies the owner/operator that the owner/operator must conduct standard monitoring under § 2202 or a system specific study under § 2203.

F. If the owner/operator has not taken TTHM and HAA5 samples under Part XI of these regulations or if the Director notifies the owner/operator that the owner/operator must comply with this Part, the owner/operator must conduct standard monitoring under § 2202 or a system specific study under § 2203.

§2206 PART XXIII COMPLIANCE MONITORING LOCATION RECOMMENDATIONS

A. The IDSE report must include recommendations and justification for where and during what month(s) TTHM and HAA5 monitoring for Part XXIII of these regulations should be conducted. The owner/operator must base the recommendations on the criteria in subsections (B) through (E) of this section.

B. The owner/operator must select the number of monitoring locations specified in Table 2200.5. The owner/operator will use these recommended locations as Part XXIII routine compliance monitoring locations, unless the Director requires different or additional locations. The owner/operator should distribute locations throughout the distribution system to the extent possible.

TABLE 2200.5 RECOMMENDED COMPLIANCE MONITORING PERIODS, FREQUENCY, and LOCATION by POPULATION and SYSTEM TYPE

Source Water Type	Population Size Category	Monitoring frequency[1]	Distribution system monitoring location			
			Total per monitoring period[2]	Highest TTHM locations	Highest HAA5 locations	Existing Part XI compliance locations
Part VIII:	<500	per year	2	1	1	.....
	500-3,300	per quarter	2	1	1	
	3,301-9,999	per quarter	2	1	1	.....
	10,000-49,999	per quarter	4	2	1	1
	50,000-249,999	per quarter	8	3	3	2
	250,000-999,999	per quarter	12	5	4	3
	1,000,000-4,999,999	per quarter	16	6	6	4
	≥5,000,000	per quarter	20	8	7	5
Ground water:	<500	per year	2	1	1	
	500-9,999	per year	2	1	1	
	10,000-99,999	per quarter	4	2	1	1
	100,000-499,999	per quarter	6	3	2	1

	≥500,000	per quarter	8	3	3	2

[1]All systems must monitor during the month of highest D.P. concentrations.
[2]Systems on quarterly monitoring must take dual sample sets every 90 days at each monitoring location, except for Part VIII systems serving 500-3,300 persons. Systems on annual monitoring and Part VIII systems serving 500-3,300 persons are required to take individual TTHM and HAA5 samples (instead of a dual sample set) at the locations with the highest TTHM and HAA5 concentrations, respectively. Only one location with a dual sample set per monitoring period is needed if the highest TTHM and HAA5 concentrations occur at the same location, and month, if monitored annually.)

C. The owner/operator must recommend Part XXIII compliance monitoring locations based on standard monitoring results, system specific study results, and Part XI compliance monitoring results. The owner/operator must follow the protocol in paragraphs (C)(1) through (C)(8) of this section. If required to monitor at more than eight locations, owner/operator must repeat the protocol as necessary. If the owner/operator does not have existing Part XI compliance monitoring results or if the owner/operator does not have enough existing Part XI compliance monitoring results, the owner/operator must repeat the protocol, skipping the provisions of paragraphs (C)(3) and (C)(7) of this section as necessary, until the owner/operator has identified the required total number of monitoring locations.

1. Location with the highest TTHM LARA not previously selected as a Part XXIII monitoring location.

2. Location with the highest HAA5 LARA not previously selected as a Part XXIII monitoring location.

3. Existing Part XI average residence time compliance monitoring location (maximum residence time compliance monitoring location for ground water systems) with the highest HAA5 LARA not previously selected as a Part XXIII monitoring location.

4. Location with the highest TTHM LARA not previously selected as a Part XXIII monitoring location.

5. Location with the highest TTHM LARA not previously selected as a Part XXIII monitoring location.

6. Location with the highest HAA5 LARA not previously selected as a Part XXIII monitoring location.

7. Existing Part XI average residence time compliance monitoring location (maximum residence time compliance monitoring location for ground water systems) with the highest TTHM LARA not previously selected as a Part XXIII monitoring location.

8. Location with the highest HAA5 LARA not previously selected as a Part XXIII monitoring location.

D. The owner/operator may recommend locations other than those specified in subsection (C) of this section if the owner/operator includes a rationale for selecting other locations. If the Director approves the alternate locations, the owner/operator must monitor at these locations to determine compliance under Part XXIII of these regulations.

E. The recommended schedule must include Part XXIII monitoring during the peak historical month for TTHM and HAA5 concentration, unless the Director approves another month. Once the owner/operator has identified the peak historical month, and if the owner/operator is required to conduct routine monitoring at least quarterly, the owner/operator must schedule Part XXIII compliance monitoring at a regular frequency of every 90 days or fewer.

Part XXIII
Stage 2 Disinfection Byproducts

§ 2301 GENERAL REQUIREMENTS

A. General. The regulations in this part establish monitoring and other requirements for achieving compliance with maximum contaminant levels based on locational running annual averages (LRAA) for total trihalomethanes (TTHM) and haloacetic acids-5 (HAA5), and for achieving compliance with maximum residual disinfectant residuals for chlorine and chloramine for certain consecutive systems.

B. Applicability. This part applies to community water systems and nontransient noncommunity water systems that use a primary or residual disinfectant other than ultraviolet light or delivers water that has been treated with a primary or residual disinfectant other than ultraviolet light.

C. Schedule. CWSs and NTNCWSs must comply with the requirements in this subpart according to the schedule in Table 2300.1.

TABLE 2300.1 SCHEDULE REQUIREMENTS BASED ON PUBLIC WATER SYSTEM TYPE

Type of system		Date of compliance with Stage 2 DBP monitoring by: [1]
1.	System serving ≥100,000	April 1, 2012.
2.	System serving 50,000-99,999	October 1, 2012.
3.	System serving 10,000-49,999	October 1, 2013.
4.	System serving < 10,000	October 1, 2013 if no Cryptosporidium monitoring is required under §2402 (A)(4) or October 1, 2014 if Cryptosporidium monitoring is required under §2402 (A)(4) or (A)(6)
Other systems that are part of a combined distribution system		
5.	Consecutive system or wholesale system	--at the same time as the system with the earliest compliance date in the combined distribution system.
6.	Monitoring frequency is specified in § 2302 (A)(2). a If quarterly monitoring is required, the owner/operator must begin monitoring in the first full calendar quarter that includes the compliance date in this Table. b If monitoring is required at a frequency that is less than quarterly, the owner/operator must begin monitoring in the calendar month recommended in the IDSE report prepared under §2202 or §2203 or the calendar month identified in the Stage 2 DBP monitoring plan developed under §2303 no later than 12 months after the compliance date in this Table.	
7.	If quarterly monitoring is required, the owner/operator must make compliance calculations at the end of the fourth calendar quarter that follows the compliance date and at the end of each subsequent quarter (or earlier if the LRAA calculated based on fewer than four quarters of data would cause the MCL to be exceeded regardless of the monitoring results of subsequent quarters). If monitoring is required at a frequency that is less than quarterly, the owner/operator must make compliance calculations beginning with the first compliance sample taken after the compliance date.	
8.	For the purpose of the schedule in this Table, the Director may determine that the combined distribution system does not include certain consecutive systems based on factors such as receiving water from a wholesale system only on an emergency basis or receiving only a small percentage and small volume of water from a wholesale system. The Director may also determine that the combined distribution system does not include certain wholesale systems based on factors such as delivering water to a consecutive system only on an emergency basis or delivering only a small percentage and small volume of	

water to a consecutive system.

[1] The Director may grant up to an additional 24 months for compliance with MCLs and operational evaluation levels if the system requires capital improvements to comply with an MCL.

D. Monitoring and compliance.

1. Systems required to monitor quarterly. To comply with Stage 2 DBP MCLs in §207 (B)(2), the owner/operator must calculate LRAAs for TTHM and HAA5 using monitoring results collected under this part and determine that each LRAA does not exceed the MCL. If the owner/operator fails to complete four consecutive quarters of monitoring, the owner/operator must calculate compliance with the MCL based on the average of the available data from the most recent four quarters. If more than one sample per quarter is collected at a monitoring location, the average of all samples taken in the quarter at that location to determine a quarterly average must be used in the LRAA calculation.

2. Systems required to monitor yearly or less frequently. To determine compliance with Stage 2 DBP MCLs in §207 (B)(2), the owner/operator must determine that each sample taken is less than the MCL. If any sample exceeds the MCL, the owner/operator must comply with the requirements of §2306. If no sample exceeds the MCL, the sample result for each monitoring location is considered the LRAA for that monitoring location.

E. Violation. The public water system owner/operator is in violation of the monitoring requirements for each quarter that a monitoring result would be used in calculating an LRAA if the owner/operator fails to monitor.

§ 2302 ROUTINE MONITORING

A. Monitoring.

1. If an IDSE report was submitted, the owner/operator must begin monitoring at the locations and months that were recommended in the IDSE report submitted under §2206 following the schedule in § 2301 (C), unless the Director requires other locations or additional locations after its review. If a 40/30 certification was submitted under §2204, the system qualified for a very small system waiver under §2205, or the system is a nontransient noncommunity water system serving < 10,000, the owner/operator must monitor at the location(s) and dates identified in the monitoring plan in §1103 (F), updated as required by § 2303.

2. The owner/operator must monitor at no fewer than the number of locations identified in Table 2300.2.

TABLE 2300.2 MINIMUM NUMBER OF MONITORING LOCATIONS (DISTRIBUTION SYSTEM MONITORING)

Distribution System Monitoring			
Source Water Type	Population Size Category	Monitoring Frequency[1]	Distribution System Monitoring Location Total per monitoring period[2]
Surface Water	< 500	Per year	2
	500-3.300	per quarter	2
	3,301-9,999	per quarter	2
	10,000-49,999	Per quarter	4
	50,000-249,999	per quarter	8
	250,000-999,999	per quarter	12
	1,000,000-4,999,999	per quarter	16
	≥5,000,000	per quarter	20
Ground Water:	<500	per year	2
	500-9,999	per year	2
	10,000-99,999	per quarter	4

	100,000-499,999	per quarter	6
	≥5,000,000	per quarter	8

[1] All systems must monitor during the month of highest DBP concentrations.
[2] Systems on quarterly monitoring must take dual sample sets every 90 days at each monitoring location, except for Part VIII systems serving 500-3,300 persons. Systems on annual monitoring and Part VIII systems serving 500-3,300 persons are required to take individual TTHM and HAA5 samples (instead of a dual sample set) at the locations with the highest TTHM and HAA5 concentrations, respectively. Only one location with a dual sample set per monitoring period is needed if highest TTHM and HAA5 concentrations occur at the same location (and month, if monitored annually).

3. If an undisinfected system begins using a disinfectant other than UV light after the dates in Part XXII of these regulations for complying with the Initial Distribution System Evaluation requirements, the owner/operator must consult with the Director to identify compliance monitoring locations for this part. A monitoring plan must be developed under §2303 that includes those monitoring locations.

B. Analytical methods. The owner/operator must use an approved method listed in Appendix E-1101-E for TTHM and HAA5 analyses in this part. Analyses must be conducted by laboratories that have received certification by EPA or the Director as specified in Appendix E-1101-E.

§ 2303 Stage 2 DBP MONITORING PLAN

A. 1. The public water system owner/operator must develop and implement a monitoring plan to be kept on file for Director and public review. The monitoring plan must contain the elements in paragraphs (A)(1)(a) through (A)(1)(d) of this section and be complete no later than the date that initial monitoring is conducted under this part.

a. Monitoring locations;

b. Monitoring dates;

c. Compliance calculation procedures; and

d. Monitoring plans for any other systems in the combined distribution system if the Director has reduced monitoring requirements under the Director's authority in §142.16(m).

2. If the public water system was not required to submit an IDSE report under either §2202 or §2203, and the owner/operator does not have sufficient Part XI monitoring locations to identify the required number of Stage 2 DBP compliance monitoring locations indicated in §2206 (B), the owner/operator must identify additional locations by alternating selection of locations representing high TTHM levels and high HAA5 levels until the required number of compliance monitoring locations have been identified. The owner/operator must also provide the rationale for identifying the locations as having high levels of TTHM or HAA5. If the public water system has more Part XI monitoring locations than required for Stage 2 DBP compliance monitoring in § 2206 (B), the owner/operator must identify which locations to use for Stage 2 DBP compliance monitoring by alternating selection of locations representing high TTHM levels and high HAA5 levels until the required number of Stage 2 DBP compliance monitoring locations have been identified.

B. If the public water system is a Part VIII system serving > 3,300 people, the owner/operator must submit a copy of the monitoring plan to the Director prior to the date that it will conduct initial monitoring under this part, unless an IDSE report submitted under Part XXII of these regulations contains all the information required by this section.

C. The owner/operator may revise its monitoring plan to reflect changes in treatment, distribution system operations and layout (including new service areas), or other factors that may affect TTHM or HAA5 formation, or for Director-approved reasons, after consultation with the Director regarding the need for changes and the appropriateness of changes. If the owner/operator changes monitoring locations, the owner/operator must replace existing compliance monitoring locations with the lowest LRAA with new locations that reflect the current distribution system locations with expected high TTHM or HAA5 levels. The Director may also require modifications in the monitoring plan. If the system is a Part VIII system serving > 3,300 people, the owner/operator must submit a copy of a modified monitoring plan to the Director prior to the date the system is required to comply with the revised monitoring plan.

§ 2304 REDUCED MONITORING

A. The owner/operator may reduce monitoring to the level specified in Table 2300.3 any time the LRAA is ≤0.040 mg/L for TTHM and ≤0.030 mg/L for HAA5 at all monitoring locations. The owner/operator may only use data collected under the provisions of this part or Part XI to qualify for reduced monitoring. In addition, the source water annual average TOC level, before any treatment, must be ≤4.0 mg/L at each treatment plant treating surface water or ground water under the direct influence of surface water, based on monitoring conducted under either § 1103 (B)(1)(c) or § 1103 (D).

TABLE 2300.3 REDUCED MONITORING FREQUENCY AND MONITORING LOCATIONS PER MONITORING PERIOD FOR DISTRIBUTION SYSTEMS

Distribution System			
Source water type	Population size category	Monitoring Frequency[1]	Distribution System Monitoring location per monitoring period
Surface Water	<500	.....	Monitoring may not be reduced
	500-3,300	per year	1 TTHM and 1 HAA5 sample: one at the location and during the quarter with the highest TTHM single measurement, one at the location and during the quarter with the highest HAA5 single measurement; 1 dual sample set per year if the highest TTHM and HAA5 measurements occurred at the same location and quarter.
	3,301-9,999	per year	2 dual sample sets: one at the location and during the quarter with the highest TTHM single measurement, one at the location and during the quarter with the highest HAA5 single measurement.
	10,000-49,999	per quarter	2 dual sample sets at the locations with the highest TTHM and highest HAA5 LRAAs.
	50,000-249,999	per quarter	4 dual sample sets--at the locations with the two highest TTHM and two highest HAA5 LRAAs.
	250,000-999,999	per quarter	6 dual sample sets--at the locations with the three highest TTHM and three highest HAA5 LRAAs.
	1,000,000-4,999,999	per quarter	8 dual sample sets--at the locations with the four highest TTHM and four highest HAA5 LRAAs.
	≥5,000,000	per quarter	10 dual sample sets--at the locations with the five highest TTHM and five highest HAA5 LRAAs.

Distribution System			
Source Water Type	Population size category	Monitoring Frequency[1]	Distribution System Monitoring location per monitoring period
Ground Water	< 500	every third year	1 TTHM and 1 HAA5 sample: one at the location and during the quarter with the highest TTHM single measurement, one at the location and during the quarter with the highest HAA5 single measurement; 1 dual sample set per year if the highest TTHM and HAA5 measurements occurred at the same location and quarter.

500-9,999	per year	1 TTHM and 1 HAA5 sample: one at the location and during the quarter with the highest TTHM single measurement, one at the location and during the quarter with the highest HAA5 single measurement; 1 dual sample set per year if the highest TTHM and HAA5 measurements occurred at the same location and quarter.
10,000-99,999	per year	2 dual sample sets: one at the location and during the quarter with the highest TTHM single measurement, one at the location and during the quarter with the highest HAA5 single measurement.
100,000-499,999	per quarter	2 dual sample sets; at the locations with the highest TTHM and highest HAA5 LRAAs.
≥500,000	per quarter	4 dual sample sets at the locations with the two highest TTHM and two highest HAA5 LRAAs.

[1] Systems on quarterly monitoring must take dual sample sets every 90 days.

B. The public water system may remain on reduced monitoring as long as the TTHM LRAA is ≤0.040 mg/L and the HAA5 LRAA is ≤0.030 mg/L at each monitoring location (for systems with quarterly reduced monitoring) or each TTHM sample is ≤0.060 mg/L and each HAA5 sample is ≤0.045 mg/L (for systems with annual or less frequent monitoring). In addition, the source water annual average TOC level, before any treatment, must be ≤4.0 mg/L at each treatment plant treating surface water or ground water under the direct influence of surface water, based on monitoring conducted under either § 1103(B)(1)(c) or §1103(D).

C. If the LRAA based on quarterly monitoring at any monitoring location exceeds either 0.040 mg/L for TTHM or 0.030 mg/L for HAA5 or if the annual (or less frequent) sample at any location exceeds either 0.060 mg/L for TTHM or 0.045 mg/L for HAA5, or if the source water annual average TOC level, before any treatment, is >4.0 mg/L at any treatment plant treating surface water or ground water under the direct influence of surface water, the owner/operator must resume routine monitoring under §2302 or begin increased monitoring if §2306 applies.

D. The Director may return the public water system to routine monitoring at his/her discretion.

§ 2305 ADDITIONAL REQUIREMENTS FOR CONSECUTIVE SYSTEMS

If the public water system is a consecutive system that does not add a disinfectant but delivers water that has been treated with a primary or residual disinfectant other than ultraviolet light, the owner/operator must comply with analytical and monitoring requirements for chlorine and chloramines in Appendix E, 1101-E(C) and §1103(C)(1) and the compliance requirements in §1104(C)(1) beginning April 1, 2009, unless required earlier by the Director, and report monitoring results under §1105(C).

§ 2306 CONDITIONS REQUIRING INCREASED MONITORING

E. If the public water system is required to monitor at a particular location annually or less frequently than annually under § 2302 or § 2304, the owner/operator must increase monitoring to dual sample sets once per quarter (taken every 90 days) at all locations if a TTHM sample is >0.080 mg/L or a HAA5 sample is >0.060 mg/L at any location.

F. The owner/operator is in violation of the MCL when the LRAA exceeds the Stage 2 DBP MCLs in § 207 (B)(2), calculated based on four consecutive quarters of monitoring (or the LRAA calculated based on fewer than four quarters of data if the MCL would be exceeded regardless of the monitoring results of subsequent quarters). The owner/operator is in violation of the monitoring requirements for each quarter that a monitoring result would be used in calculating an LRAA if the owner/operator fails to monitor.

G. The public water system may return to routine monitoring once the owner/operator has conducted increased monitoring for at least four consecutive quarters and the LRAA for every monitoring location is ≤0.060 mg/L for TTHM and ≤0.045 mg/L for HAA5.

§ 2307 OPERATIONAL EVALUATION LEVELS

D. The public water system has exceeded the operational evaluation level at any monitoring location where the sum of the two previous quarters' TTHM results plus twice the current quarter's TTHM result, divided by 4 to determine an average, exceeds 0.080 mg/L, or where the sum of the two previous quarters' HAA5 results plus twice the current quarter's HAA5 result, divided by 4 to determine an average, exceeds 0.060 mg/L.

E. 1. If the public water system exceeds the operational evaluation level, the owner/operator must conduct an operational evaluation and submit a written report of the evaluation to the Director no later than 90 days after being notified of the analytical result that causes the public water system to exceed the operational evaluation level. The written report must be made available to the public upon request.

2. The public water system's operational evaluation must include an examination of system treatment and distribution operational practices, including storage tank operations, excess storage capacity, distribution system flushing, changes in sources or source water quality, and treatment changes or problems that may contribute to TTHM and HAA5 formation and what steps could be considered to minimize future exceedences.

a. The owner/operator may request and the Director may allow the owner/operator to limit the scope of an evaluation if the owner/operator is able to identify the cause of the operational evaluation level exceedance.

b. The public water system's request to limit the scope of the evaluation does not extend the schedule in paragraph (B)(1) of this section for submitting the written report. The Director must approve this limited scope of evaluation in writing and the owner/operator must keep that approval with the completed report.

§ 2308 REQUIREMENTS FOR REMAINING ON REDUCED TTHM AND HAA5 MONITORING BASED ON PART XI RESULTS

The public water system may remain on reduced monitoring after the dates identified in §2301 (C) for compliance with this part only if the public water system qualifies for a 40/30 certification under §2204 or has received a very small system waiver under §2205, plus it meets the reduced monitoring criteria in §2304 (A), and the owner/operator does not change or add monitoring locations from those used for compliance monitoring under Part XI of these regulations. If the public water system's monitoring locations under this part differ from the system's monitoring locations under Part XI of these regulations, the system may not remain on reduced monitoring after the dates identified in §2301(C) for compliance with this part.

§ 2309 REQUIREMENTS FOR REMAINING ON INCREASED TTHM AND HAA5 MONITORING BASED ON PART XI RESULTS

If the public water system was on increased monitoring under §1103 (B)(1), it must remain on increased monitoring until the system qualifies for a return to routine monitoring under §2306 (C). The owner/operator must conduct increased monitoring under § 2306 at the monitoring locations in the monitoring plan developed under §2303 beginning on the date identified in §2301 (C) for compliance with this part and must remain on increased monitoring until the system qualifies for a return to routine monitoring under §2306 (C).

§ 2310 REPORTING AND RECORDKEEPING REQUIREMENTS

A. Reporting.

1. The owner/operator must report the following information for each monitoring location to the Director within 10 days of the end of any quarter in which monitoring is required:

a. Number of samples taken during the last quarter.

b. Date and results of each sample taken during the last quarter.

c. Arithmetic average of quarterly results for the last four quarters for each monitoring location (LRAA), beginning at the end of the fourth calendar quarter that follows the compliance date and at the end of each subsequent quarter. If the LRAA calculated based on fewer than four quarters of data would cause the MCL to be exceeded regardless of the monitoring results of subsequent quarters, the owner/operator must report this information to the Director as part of the first report due following the compliance date or anytime thereafter that this determination is made. If the system is required to conduct monitoring at a frequency that is less than quarterly, the owner/operator must make compliance calculations beginning with the first compliance sample taken after the compliance date, unless the owner/operator is required to conduct increased monitoring under §2306.

d. Whether, based on §207 (B)(2) and this subpart, the MCL was violated at any monitoring location.

e. Any operational evaluation levels that were exceeded during the quarter and, if so, the location and date, and the calculated TTHM and HAA5 levels.

2. If the public water system is a Part VIII system seeking to qualify for or remain on reduced TTHM/HAA5 monitoring, the owner/operator must report the following source water TOC information for each treatment plant that treats surface water or ground water under the direct influence of surface water to the Director within 10 days of the end of any quarter in which monitoring is required:

a. The number of source water TOC samples taken each month during the last quarter.

b. The date and result of each sample taken during the last quarter.

c. The quarterly average of monthly samples taken during last quarter or the result of the quarterly sample.

d. The running annual average (RAA) of quarterly averages from the past four quarters.

e. Whether the RAA exceeded 4.0 mg/L.

3. The Director may choose to perform calculations and determine whether the MCL was exceeded or the system is eligible for reduced monitoring in lieu of having the system report that information.

B. Recordkeeping. The public water system owner/operator must retain any Stage 2 DBP monitoring plans and Stage 2 DBP monitoring results as required by §503.

Part XXIV
Enhanced Treatment for Cryptosporidium

§2401 General requirements.

A. The regulations in this subpart establish or extend treatment technique requirements in lieu of maximum contaminant levels for Cryptosporidium. These requirements are in addition to requirements for filtration and disinfection in Parts VIII, XIII, and XXI of these regulations.

B. Applicability. The requirements of these regulations apply to all Part VIII systems, which are public water systems supplied by a surface water source and public water systems supplied by a ground water source under the direct influence of surface water.

1. Wholesale systems, as defined in § 104, must comply with the requirements of this part based on the population of the largest system in the combined distribution system.

2. The requirements of this part for filtered systems apply to systems required by the Navajo Nation Primary Drinking Water Regulations ("NNPDWR") to provide filtration treatment, whether or not the system is currently operating a filtration system.

3. The requirements of this part for unfiltered systems apply only to unfiltered systems that timely met and continue to meet the filtration avoidance criteria in Parts VIII, XIII, and XXI of these regulations.

C. Requirements. Systems subject to this part must comply with the following requirements:

1. Systems must conduct an initial and a second round of source water monitoring for each plant that treats a surface water or GWUDI source. This monitoring may include sampling for Cryptosporidium, E. coli, and turbidity as described in §§2402 through 2405 and Appendix G 2401-G through 2402-G, to determine what level, if any, of additional Cryptosporidium treatment they must provide.

2. Systems that plan to make a significant change to their disinfection practice must develop disinfection profiles and calculate disinfection benchmarks, as described in §§2407 through 2409.

3. Filtered systems must determine their Cryptosporidium treatment bin classification as described in §2409 and provide additional treatment for Cryptosporidium, if required, as described in §2410. All unfiltered systems must provide treatment for Cryptosporidium as described in §2411. Filtered and unfiltered systems must implement Cryptosporidium treatment according to the schedule in §2412.

4. Systems with uncovered finished water storage facilities must comply with the requirements to cover the facility or treat the discharge from the facility as described in §2413.

5. Systems required to provide additional treatment for Cryptosporidium must implement microbial toolbox options that are designed and operated as described in §§2414 through 2419.

6. Systems must comply with the applicable recordkeeping and reporting requirements described in §§2420 through 2421.

7. Systems must address significant deficiencies identified in sanitary surveys performed by PWSSP as described in §2422.

Source Water Monitoring Requirements

§2402 Source Water Monitoring Requirements

A. Initial round of source water monitoring. Systems must conduct the following monitoring according to the schedule in Table 2400.1 unless they meet the monitoring exemption criteria in subsection (D) of this section.

1. Filtered systems serving at least 10,000 people must sample their source water for Cryptosporidium, E. coli, and turbidity at least monthly for 24 months.

2. Unfiltered systems serving at least 10,000 people must sample their source water for Cryptosporidium at least monthly for 24 months.

3. a. Filtered systems serving fewer than 10,000 people must sample their source water for E. coli at least once every two weeks for 12 months.

b. A filtered system serving fewer than 10,000 people may avoid E. coli monitoring if the system notifies the Director that it will monitor for Cryptosporidium as described in paragraph (A)(4) of this section. The system must notify the Director no later than 3 months prior to the date the system is otherwise required to start E. coli monitoring under §2402(C).

4. Filtered systems serving fewer than 10,000 people must sample their source water for Cryptosporidium at least twice per month for 12 months or at least monthly for 24 months if they meet one of the following, based on monitoring conducted under paragraph (A)(3) of this section:

a. For systems using lake/reservoir sources, the annual mean E. coli concentration is greater than 10 E. coli/100 mL.

b. For systems using flowing stream sources, the annual mean E. coli concentration is greater than 50 E. coli/100 mL.

c. The system does not conduct E. coli monitoring as described in paragraph (A)(3) of this section.

d. Systems using ground water under the direct influence of surface water (GWUDI) must comply with the requirements of paragraph (A)(4) of this section based on the E. coli level that applies to the nearest surface water body. If no surface water body is nearby, the system must comply based on the requirements that apply to systems using lake/reservoir sources.

5. For filtered systems serving fewer than 10,000 people, the Director may approve monitoring for an indicator other than E. coli under paragraph (A)(3) of this section. The Director also may approve an alternative to the E. coli concentration in paragraph (A)(4)(a), (b) or (d) of this section to trigger Cryptosporidium monitoring. This approval by the Director must be provided to the system in writing and must include the basis for the Director's determination that the alternative indicator and/or trigger level will provide a more accurate identification of whether a system will exceed the Bin 1 Cryptosporidium level in §2409.

6. Unfiltered systems serving fewer than 10,000 people must sample their source water for Cryptosporidium at least twice per month for 12 months or at least monthly for 24 months.

7. Systems may sample more frequently than required under this section if the sampling frequency is evenly spaced throughout the monitoring period.

B. Second round of source water monitoring. Systems must conduct a second round of source water monitoring that meets the requirements for monitoring parameters, frequency, and duration described in subsection (A) of this section, unless they meet the monitoring exemption criteria in subsecton (D) of this section. Systems must conduct this monitoring according to the schedule in Table 2400.1.

C. Monitoring schedule. Systems must begin the monitoring required in subsections (A) and (B) of this section no later than the month beginning with the date listed in this table:

TABLE 2400.1 Source Water Monitoring Starting Dates Table

Systems that serve . . .	Must begin the first round of source water monitoring no later than the month beginning . . .	And must begin the second round of source water monitoring no later than the month beginning . . .
(1) At least 100,000 people	(a) October 1, 2006	(b) April 1, 2015
(2) From 50,000 to 99,999 people	(a) April 1, 2007	(b) October 1, 2015
(3) From 10,000 to 49,999 people	(a) April 1, 2008	(b) October 1, 2016
(4) Fewer than 10,000 and monitor for E. coli [a]	(a) October 1, 2008	(b) October 1, 2017
(5) Fewer than 10,000 and monitor for Cryptosporidium [b]	(a) April 1, 2010	(b) April 1, 2019

[a]Applies only to filtered systems.

[b]Applies to filtered systems that meet the conditions of paragraph (A)(4) of this section and unfiltered systems.

D. Monitoring avoidance

1. Filtered systems are not required to conduct source water monitoring under this part if the system will provide a total of at least 5.5-log of treatment for Cryptosporidium, equivalent to meeting the treatment requirements of Bin 4 in §2410.

2. Unfiltered systems are not required to conduct source water monitoring under this part if the system will provide a total of at least 3-log Cryptosporidium inactivation, equivalent to meeting the treatment requirements for unfiltered systems with a mean Cryptosporidium concentration of greater than 0.01 oocysts/L in §2411.

3. If a system chooses to provide the level of treatment in paragraph (D)(1) or (2) of this section, as applicable, rather than start source water monitoring, the system must notify the Director in writing no later than the date the system is otherwise required to submit a sampling schedule for monitoring under §2403. Alternatively, a system may choose to stop sampling at any point after it has initiated monitoring if it notifies the Director in writing that it will provide this level of treatment. Systems must install and operate technologies to provide this level of treatment by the applicable treatment compliance date in §2412.

E. Plants operating only part of the year. Systems with Part VIII plants that operate for only part of the year must conduct source water monitoring in accordance with this part, but with the following modifications:

1. Systems must sample their source water only during the months that the plant operates unless the Director specifies another monitoring period based on plant operating practices.

2. Systems with plants that operate fewer than six months per year and that monitor for Cryptosporidium must collect at least six Cryptosporidium samples per year during each of two years of monitoring. Samples must be evenly spaced throughout the period the plant operates.

F. New sources

1. A system that begins using a new source of surface water or GWUDI after the system is required to begin monitoring under subsection (C) of this section must monitor the new source on a schedule the Director approves. Source water monitoring must meet the requirements of this part. The system must also meet the bin classification and Cryptosporidium treatment requirements of §2409 and §2410 or §2412, as applicable, for the new source on a schedule the Director approves.

2. The requirements of §2402(F) apply to Part VIII systems that begin operation after the monitoring start date applicable to the system's size under subsection (C) of this section.

3. The system must begin a second round of source water monitoring no later than 6 years following initial bin classification under §2409 or determination of the mean Cryptosporidium level under §2411, as applicable.

G. Failure to collect any source water sample required under this section in accordance with the sampling schedule, sampling location, analytical method, approved laboratory, and reporting requirements of §§2403 through 2405 and Appendix G 2401-G and 2404-G is a monitoring violation.

H. Grandfathering monitoring data. Systems may use (grandfather) monitoring data collected prior to the applicable monitoring start date in subsection (C) of this section to meet the initial source water monitoring requirements in subsection (A) of this section. Grandfathered data may substitute for an equivalent number of months at the end of the monitoring period. All data submitted under this paragraph must meet the requirements in §2406.

§2403 Sampling schedules

A. Systems required to conduct source water monitoring under §2402 must submit a sampling schedule that specifies the calendar dates when the system will collect each required sample.

1. Systems must submit sampling schedules no later than 3 months prior to the applicable date listed in §2402(C) for each round of required monitoring.

2. All systems must submit their sampling schedule for the initial round of source water monitoring under §2402(A) to the Director.

3. All systems must submit sampling schedules for the second round of source water monitoring under §2402(B) to the Director.

4. If EPA or the Director does not respond to a system regarding its sampling schedule, the system must sample at the reported schedule.

B. Systems must collect samples within two days before or two days after the dates indicated in their sampling schedule (i.e., within a five-day period around the schedule date) unless one of the conditions of paragraph (B)(1) or (2) of this section applies.

1. If an extreme condition or situation exists that may pose danger to the sample collector, or that cannot be avoided and causes the system to be unable to sample in the scheduled five-day period, the system must sample as close to the scheduled date as is feasible unless the Director approves an alternative sampling date. The system must submit an explanation for the delayed sampling date to the Director concurrent with the shipment of the sample to the laboratory.

2. a. If a system is unable to report a valid analytical result for a scheduled sampling date due to equipment failure, loss of or damage to the sample, failure to comply with the analytical method requirements, including the quality control requirements in Appendix G-2401-G, or the failure of an approved laboratory to analyze the sample, then the system must collect a replacement sample.

b. The system must collect the replacement sample not later than 21 days after receiving information that an analytical result cannot be reported for the scheduled date unless the system demonstrates that collecting a replacement sample within this time frame is not feasible or the Director approves an alternative resampling date. The system must submit an explanation for the delayed sampling date to the Director concurrent with the shipment of the sample to the laboratory.

C. Systems that fail to meet the criteria of subsection (B) of this section for any source water sample required under §2402 must revise their sampling schedules to add dates for collecting all missed samples. Systems must submit the revised schedule to the Director for approval prior to when the system begins collecting the missed samples.

§2404 Sampling locations

A. Systems required to conduct source water monitoring under §2402 must collect samples for each plant that treats a surface water or GWUDI source. Where multiple plants draw water from the same influent, such as the same pipe or intake, the Director may approve one set of monitoring results to be used to satisfy the requirements of §2402 for all plants.

B. 1. Systems must collect source water samples prior to chemical treatment, such as coagulants, oxidants and disinfectants, unless the system meets the conditions of paragraph (B)(2) of this section.

2. The Director may approve a system to collect a source water sample after chemical treatment. To grant this approval, the Director must determine that collecting a sample prior to chemical treatment is not feasible for the system and that the chemical treatment is unlikely to have a significant adverse effect on the analysis of the sample.

C. Systems that recycle filter backwash water must collect source water samples prior to the point of filter backwash water addition.

D. Bank filtration

1. Systems that receive Cryptosporidium treatment credit for bank filtration under §805 (D) or §2106 (C), as applicable, must collect source water samples in the surface water prior to bank filtration.

2. Systems that use bank filtration as pretreatment to a filtration plant must collect source water samples from the well (i.e., after bank filtration). Use of bank filtration during monitoring must be consistent with routine operational practice. Systems collecting samples after a bank filtration process may not receive treatment credit for the bank filtration under §2416(C).

E. Multiple sources. Systems with plants that use multiple water sources, including multiple surface water sources and blended surface water and ground water sources, must collect samples as specified in paragraph (E)(1) or (2) of this section. The use of multiple sources during monitoring must be consistent with routine operational practice.

1. If a sampling tap is available where the sources are combined prior to treatment, systems must collect samples from the tap.

2. If a sampling tap where the sources are combined prior to treatment is not available, systems must collect samples at each source near the intake on the same day and must follow either paragraph (E)(2)(a) or (b) of this section for sample analysis.

   a. Systems may composite samples from each source into one sample prior to analysis. The volume of sample from each source must be weighted according to the proportion of the source in the total plant flow at the time the sample is collected.

   b. Systems may analyze samples from each source separately and calculate a weighted average of the analysis results for each sampling date. The weighted average must be calculated by multiplying the analysis result for each source by the fraction the source contributed to total plant flow at the time the sample was collected and then summing these values.

F. Additional Requirements. Systems must submit a description of their sampling location(s) to the Director at the same time as the sampling schedule required under §2403. This description must address the position of the sampling location in relation to the system's water source(s) and treatment processes, including pretreatment, points of chemical treatment, and filter backwash recycle. If the Director does not respond to a system regarding sampling location(s), the system must sample at the reported location(s).

§2405 Reporting Source Water Monitoring Results

A. Systems must report results from the source water monitoring required under §2402 no later than 10 days after the end of the first month following the month when the sample is collected.

B. All systems must report results from the initial source water monitoring required under §2402 (A) to the Director.

C. All systems must report results from the second round of source water monitoring required under §2402 (B) to the Director.

D. Systems must report the applicable information in paragraphs (D)(1) and (2) of this section for the source water monitoring required under §2402.

1. Systems must report the following data elements for each Cryptosporidium analysis:

TABLE 2400.2 DATA ELEMENTS FOR EACH CRYPTOSPORIDIUM ANALYSIS

Data element
1. PWS ID
2. Facility ID
3. Sample collection date
4. Sample type (field or matrix spike)
5. Sample volume filtered (L), to nearest \1/4\ L
6. Was 100% of filtered volume examined
7. Number of oocysts counted

   a. For matrix spike samples, systems must also report the sample volume spiked and estimated number of oocysts spiked. These data are not required for field samples.

   b. For samples in which less than 10 L is filtered or less than 100% of the sample volume is examined, systems must also report the number of filters used and the packed pellet volume.

   c. For samples in which less than 100% of sample volume is examined, systems must also report the volume of re-suspended concentrate and volume of this resuspension processed through immunomagnetic separation.

2. Systems must report the following data elements for each E. coli analysis:

TABLE 2400.3 DATA ELEMENTS FOR EACH E. COLI ANALYSIS

Data element.
1. PWS ID 2. Facility ID 3. Sample collection date 4. Analytical method number 5. Method type 6. Source type (flowing stream, lake/reservoir, GWUDI) 7. E. coli/100 mL 8. Turbidity[1]

[1]Systems serving fewer than 10,000 people that are not required to monitor for turbidity under § 2402 are not required to report turbidity with their e. Coli results.

§2406 Grandfathering Previously Collected Data

A. 1. Systems may comply with the initial source water monitoring requirements of §2402 (A) by grandfathering sample results collected before the system is required to begin monitoring (i.e., previously collected data). To be grandfathered, the sample results and analysis must meet the criteria in this section and the Director must approve.

2. A filtered system may grandfather Cryptosporidium samples to meet the requirements of §2402 (A) when the system does not have corresponding E. coli and turbidity samples. A system that grandfathers Cryptosporidium samples without E. coli and turbidity samples is not required to collect E. coli and turbidity samples when the system completes the requirements for Cryptosporidium monitoring under §2402 (A).

B. Sampling location. The sampling location must meet the conditions in § 2404.

C. Sampling frequency. Cryptosporidium samples were collected no less frequently than each calendar month on a regular schedule, beginning no earlier than January 1999. Sample collection intervals may vary for the conditions specified in §2403(B)(1) and (2) if the system provides documentation of the condition when reporting monitoring results.

1. The Director may approve grandfathering of previously collected data where there are time gaps in the sampling frequency if the system conducts additional monitoring the Director specifies to ensure that the data used to comply with the initial source water monitoring requirements of §2402 (A) are seasonally representative and unbiased.

2. Systems may grandfather previously collected data where the sampling frequency within each month varied. If the Cryptosporidium sampling frequency varied, systems must follow the monthly averaging procedure in §2409(B)(5) or §2411(A)(3), as applicable, when calculating the bin classification for filtered systems or the mean Cryptosporidium concentration for unfiltered systems.

D. Reporting monitoring results for grandfathering. Systems that request to grandfather previously collected monitoring results must report the following information by the applicable dates listed in this subsection. Systems serving at least 10,000 people must report this information to EPA unless the Director approves reporting to the Director rather than EPA. Systems serving fewer than 10,000 people must report this information to the Director.

1. Systems must report that they intend to submit previously collected monitoring results for grandfathering. This report must specify the number of previously collected results the system will submit, the dates of the first and last sample, and whether a system will conduct additional source water monitoring to meet the requirements of §2402 (A). Systems must report this information no later than the date the sampling schedule under §2403 is required.

2. Systems must report previously collected monitoring results for grandfathering, along with the associated documentation listed in paragraphs (F)(2)(a) through (d) of this section, no later than two months after the applicable date listed in §2402 (C).

a. For each sample result, systems must report the applicable data elements in §2405.

b. Systems must certify that the reported monitoring results include all results the system generated during the time period beginning with the first reported result and ending with the final reported result. This applies to samples that were collected from the sampling location specified for source water monitoring under this subpart, not spiked, and analyzed using the laboratory's routine process for

the analytical methods listed in this section.

c. Systems must certify that the samples were representative of a plant's source water(s) and the source water(s) have not changed. Systems must report a description of the sampling location(s), which must address the position of the sampling location in relation to the system's water source(s) and treatment processes, including points of chemical addition and filter backwash recycle.

d. For Cryptosporidium samples, the laboratory or laboratories that analyzed the samples must provide a letter certifying that the quality control criteria specified in the methods listed in paragraph (C)(1) of this section were met for each sample batch associated with the reported results. Alternatively, the laboratory may provide bench sheets and sample examination report forms for each field, matrix spike, IPR, OPR, and method blank sample associated with the reported results.

E. If the Director determines that a previously collected data set submitted for grandfathering was generated during source water conditions that were not normal for the system, such as a drought, the Director may disapprove the data. Alternatively, the Director may approve the previously collected data if the system reports additional source water monitoring data, as determined by the Director, to ensure that the data set used under §2409 or §2411 represents average source water conditions for the system.

F. If a system submits previously collected data that fully meet the number of samples required for initial source water monitoring under §2402 (B) and some of the data are rejected due to not meeting the requirements of this section, systems must conduct additional monitoring to replace rejected data on a schedule the Director approves. Systems are not required to begin this additional monitoring until two months after notification that data have been rejected and additional monitoring is necessary.

Disinfection Profiling and Benchmarking Requirements

§2407 Requirements when making a significant change in disinfection practice

A. Following the completion of initial source water monitoring under §2402 (A), a system that plans to make a significant change to its disinfection practice, as defined in subsection (B) of this section, must develop disinfection profiles and calculate disinfection benchmarks for Giardia lamblia and viruses as described in §2408. Prior to changing the disinfection practice, the system must notify the Director and must include in this notice the information in paragraphs (A)(1) through (3) of this section.

1. A completed disinfection profile and disinfection benchmark for Giardia lamblia and viruses as described in §2408.

2. A description of the proposed change in disinfection practice.

3. An analysis of how the proposed change will affect the current level of disinfection.

B. Significant changes to disinfection practice are defined as follows:

1. Changes to the point of disinfection;
2. Changes to the disinfectant(s) used in the treatment plant;
3. Changes to the disinfection process; or
4. Any other modification identified by the Director as a significant change to disinfection practice.

§2408 Developing the disinfection profile and benchmark

A. Systems required to develop disinfection profiles under §2407 must follow the requirements of this section. Systems must monitor at least weekly for a period of 12 consecutive months to determine the total log inactivation for Giardia lamblia and viruses. If systems monitor more frequently, the monitoring frequency must be evenly spaced. Systems that operate for fewer than 12 months per year must monitor weekly during the period of operation. Systems must determine log inactivation for Giardia lamblia through the entire plant, based on $CT_{99.9}$ values in Tables 800-D-4 through 800-D-9, 800-D-10 and Table 800-D-11 of Appendix D-801-D as applicable. Systems must determine log inactivation for viruses through the entire treatment plant based on a protocol approved by the Director.

B. Systems with a single point of disinfectant application prior to the entrance to the distribution system must conduct the monitoring in paragraphs (B)(1) through (4) of this section. Systems with more than one point of disinfectant application must conduct the

monitoring in paragraphs (B)(1) through (4) of this section for each disinfection segment. Systems must monitor the parameters necessary to determine the total inactivation ratio, using analytical methods in Appendix D-801-D (A).

1. For systems using a disinfectant other than UV, the temperature of the disinfected water must be measured at each residual disinfectant concentration sampling point during peak hourly flow or at an alternative location approved by the Director.

2. For systems using chlorine, the pH of the disinfected water must be measured at each chlorine residual disinfectant concentration sampling point during peak hourly flow or at an alternative location approved by the Director.

3. The disinfectant contact time(s) (t) must be determined during peak hourly flow.

4. The residual disinfectant concentration(s) (C) of the water before or at the first customer and prior to each additional point of disinfectant application must be measured during peak hourly flow.

C. In lieu of conducting new monitoring under subsection (B) of this section, systems may elect to meet the requirements of paragraphs (C)(1) or (2) of this section.

1. Systems that have at least one year of existing data that are substantially equivalent to data collected under the provisions of subsection (B) of this section may use these data to develop disinfection profiles as specified in this section if the system has neither made a significant change to its treatment practice nor changed sources since the data were collected. Systems may develop disinfection profiles using up to three years of existing data.

2. Systems may use disinfection profile(s) developed under §804 or §2104 (A) through (G) in lieu of developing a new profile if the system has neither made a significant change to its treatment practice nor changed sources since the profile was developed. Systems that have not developed a virus profile under §804 or §2104 (A) through (G) must develop a virus profile using the same monitoring data on which the Giardia lamblia profile is based.

D. Systems must calculate the total inactivation ratio for Giardia lamblia as specified in paragraphs (D)(1) through (3) of this section.

1. Systems using only one point of disinfectant application may determine the total inactivation ratio for the disinfection segment based on either of the methods in paragraph (D)(1)(a) or (b) of this section.

   a. Determine one inactivation ratio ($CTcalc/CT_{99.9}$) before or at the first customer during peak hourly flow.

   b. Determine successive $CTcalc/CT_{99.9}$ values, representing sequential inactivation ratios, between the point of disinfectant application and a point before or at the first customer during peak hourly flow. The system must calculate the total inactivation ratio by determining ($CTcalc/CT_{99.9}$) for each sequence and then adding the ($CTcalc/CT_{99.9}$) values together to determine ($\sum(CTcalc/CT_{99.9})$).

2. Systems using more than one point of disinfectant application before the first customer must determine the CT value of each disinfection segment immediately prior to the next point of disinfectant application, or for the final segment, before or at the first customer, during peak hourly flow. The ($CTcalc/CT_{99.9}$) value of each segment and ($\sum(CTcalc/CT_{99.9})$) must be calculated using the method in paragraph (D)(1)(b) of this section.

3. The system must determine the total logs of inactivation by multiplying the value calculated in paragraph (D)(1) or (D)(2) of this section by 3.0.

4. Systems must calculate the log of inactivation for viruses using a protocol approved by the Director.

E. Systems must use the procedures specified in paragraphs (E)(1) and (2) of this section to calculate a disinfection benchmark.

1. For each year of profiling data collected and calculated under subsections (A) through (D) of this section, systems must determine the lowest mean monthly level of both Giardia lamblia and virus inactivation. Systems must determine the mean Giardia lamblia and virus inactivation for each calendar month for each year of profiling data by dividing the sum of daily or weekly Giardia lamblia and virus log inactivation by the number of values

calculated for that month.

2. The disinfection benchmark is the lowest monthly mean value (for systems with one year of profiling data) or the mean of the lowest monthly mean values (for systems with more than one year of profiling data) of Giardia lamblia and virus log inactivation in each year of profiling data.

Treatment Technique Requirements.

§2409 Bin classification for filtered systems.

A. Following completion of the initial round of source water monitoring required under §2402 (A), filtered systems must calculate an initial Cryptosporidium bin concentration for each plant for which monitoring was required. Calculation of the bin concentration must use the Cryptosporidium results reported under §2402 (A) and must follow the procedures in paragraphs (B)(1) through (5) of this section.

B. 1. For systems that collect a total of at least 48 samples, the bin concentration is equal to the arithmetic mean of all sample concentrations.

2. For systems that collect a total of at least 24 samples, but not more than 47 samples, the bin concentration is equal to the highest arithmetic mean of all sample concentrations in any 12 consecutive months during which Cryptosporidium samples were collected.

3. For systems that serve fewer than 10,000 people and monitor for Cryptosporidium for only one year (i.e., collect 24 samples in 12 months), the bin concentration is equal to the arithmetic mean of all sample concentrations.

4. For systems with plants operating only part of the year that monitor fewer than 12 months per year under §2402(E), the bin concentration is equal to the highest arithmetic mean of all sample concentrations during any year of Cryptosporidium monitoring.

5. If the monthly Cryptosporidium sampling frequency varies, systems must first calculate a monthly average for each month of monitoring. Systems must then use these monthly average concentrations, rather than individual sample concentrations, in the applicable calculation for bin classification in paragraphs (B)(1) through (4) of this section.

C. Filtered systems must determine their initial bin classification from the following table and using the Cryptosporidium bin concentration calculated under subsections (A)-(B) of this section:

TABLE 2400.4 Bin Classification Table for Filtered Systems

For systems that are:	With a Cryptosporidium bin concentration of...[1]	The bin classification is
. . . required to monitor for Cryptosporidium under §2402	Cryptosporidium <0.075 oocyst/L.	Bin 1
	0.075 oocysts/L ≤Cryptosporidium <1.0 oocysts/L.	Bin 2
	1.0 oocysts/L ≤Cryptosporidium <3.0 oocysts/L.	Bin 3
	Cryptosporidium ≥3.0 oocysts/L.	Bin 4
. . . serving fewer than 10,000 people and NOT required to monitor for Cryptosporidium under §2402(A)(4)	NA	Bin 1.

[1]Based on calculations in paragraph (A) or (D) of this section, as applicable.

D. Following completion of the second round of source water monitoring required under §2402(B), filtered systems must recalculate their Cryptosporidium bin concentration using the Cryptosporidium results reported under §2402 (B) and following the procedures in paragraphs (B)(1) through (4) of this section. Systems must then redetermine their bin classification using this bin concentration and Table 2400.4.

E. 1. Filtered systems must report their initial bin classification under subsection (C) of this

section to the Director for approval no later than 6 months after the system is required to complete initial source water monitoring based on the schedule in §2402 (C).

2. Systems must report their bin classification under subsection (D) of this section to the Director for approval no later than 6 months after the system is required to complete the second round of source water monitoring based on the schedule in §2402 (C).

3. The bin classification report to the Director must include a summary of source water monitoring data and the calculation procedure used to determine bin classification.

F. Failure to comply with the conditions of subsection (E) of this section is a violation of the treatment technique requirement.

§2410 Filtered system additional Cryptosporidium treatment requirements.

A. Filtered systems must provide the level of additional treatment for Cryptosporidium specified in this subsection based on their bin classification as determined under §2409 and according to the schedule in §2412.

TABLE 2400.5 ADDITIONAL CRYPTOSPORIDIUM TREATMENT REQUIREMENTS FOR FILTERED SYSTEMS BASED ON BIN CLASSIFICATION

If the system bin classification is...	And the system uses the following filtration treatment in full compliance with Parts VIII, XIII, and XXI of this part (as applicable), then the additional Cryptosporidium treatment requirements are . . .			
	Conventional filtration treatment (including softening)	Direct Filtration	Slow sand or diatomaceous earth filtration	Alternative filtration technologies
Bin 1.....	No additional treatment	No additional treatment.....	No additional treatment	No additional Treatment
Bin 2.....	1-log treatment....	1. 5-log treatment	1-log treatment	([1])
Bin 3.....	2-log treatment....	2. 5-log treatment	2-log treatment	([2])
Bin 4.....	2.5 log treatment....	3. 3-log treatment	2.5 log treatment	([3])

[1]As determined by the Director such that the total Cryptosporidium removal and inactivation is at least 4.0-log.
[2]As determined by the Director such that the total Cryptosporidium removal and inactivation is at least 5.0-log.
[3]As determined by the Director such that the total Cryptosporidium removal and inactivation is at least 5.5-log.

B. 1. Filtered systems must use one or more of the treatment and management options listed in §2414, termed the microbial toolbox, to comply with the additional Cryptosporidium treatment required in subsection (A) of this section.

2. Systems classified in Bin 3 and Bin 4 must achieve at least 1-log of the additional Cryptosporidium treatment required under subsection (A) of this section using either one or a combination of the following: bag filters, bank filtration, cartridge filters, chlorine dioxide, membranes, ozone, or UV, as described in §2415 through §2419.

C. Failure by a system in any month to achieve treatment credit by meeting criteria in §2415 through §2419 for microbial toolbox options that is at least equal to the level of treatment required in subsection (A) of this section is a violation of the treatment technique requirement.

D. If the Director determines during a sanitary survey or an equivalent source water assessment that after a system completed the monitoring conducted under §2402 (A) or §2402 (B) significant changes occurred in the system's watershed that could lead to increased contamination of the source water by Cryptosporidium, the system must take actions specified by the Director to address the contamination. These actions may include additional source water monitoring and/or

implementing microbial toolbox options listed in §2414.

§2411 Unfiltered system Cryptosporidium treatment requirements

A. Determination of mean Cryptosporidium level.

1. Following completion of the initial source water monitoring required under §2402 (A), unfiltered systems must calculate the arithmetic mean of all Cryptosporidium sample concentrations reported under §2402 (A). Systems must report this value to the Director for approval no later than 6 months after the month the system is required to complete initial source water monitoring based on the schedule in § 2402 (C).

2. Following completion of the second round of source water monitoring required under §2402 (B), unfiltered systems must calculate the arithmetic mean of all Cryptosporidium sample concentrations reported under §2402 (B). Systems must report this value to the Director for approval no later than 6 months after the month the system is required to complete the second round of source water monitoring based on the schedule in §2402 (C).

3. If the monthly Cryptosporidium sampling frequency varies, systems must first calculate a monthly average for each month of monitoring. Systems must then use these monthly average concentrations, rather than individual sample concentrations, in the calculation of the mean Cryptosporidium level in paragraphs (A)(1) or (2) of this section.

4. The report to the Director of the mean Cryptosporidium levels calculated under paragraphs (A)(1) and (2) of this section must include a summary of the source water monitoring data used for the calculation.

5. Failure to comply with the conditions of subsection (A) of this section is a violation of the treatment technique requirement.

B. Cryptosporidium inactivation requirements. Unfiltered systems must provide the level of inactivation for Cryptosporidium specified in this paragraph, based on their mean Cryptosporidium levels as determined under paragraph (A) of this section and according to the schedule in §2412.

1. Unfiltered systems with a mean Cryptosporidium level of 0.01 oocysts/L or less must provide at least 2-log Cryptosporidium inactivation.

2. Unfiltered systems with a mean Cryptosporidium level of greater than 0.01 oocysts/L must provide at least 3-log Cryptosporidium inactivation.

C. Inactivation treatment technology requirements. Unfiltered systems must use chlorine dioxide, ozone, or UV as described in §2419 to meet the Cryptosporidium inactivation requirements of this section.

1. Systems that use chlorine dioxide or ozone and fail to achieve the Cryptosporidium inactivation required in subsection (B) of this section on more than one day in the calendar month are in violation of the treatment technique requirement.

2. Systems that use UV light and fail to achieve the Cryptosporidium inactivation required in subsection (B) of this section by meeting the criteria in §2419(D)(3)(b) are in violation of the treatment technique requirement.

D. Use of two disinfectants. Unfiltered systems must meet the combined Cryptosporidium inactivation requirements of this section and Giardia lamblia and virus inactivation requirements of §804(A) using a minimum of two disinfectants, and each of two disinfectants must separately achieve the total inactivation required for either *Cryptosporidium*, *Giardia lamblia*, or viruses.

§2412 Schedule for compliance with Cryptosporidium treatment requirements

A. Following initial bin classification under §2409(C), filtered systems must provide the level of treatment for Cryptosporidium required under §2410 according to the schedule in subsection (C) of this section.

B. Following initial determination of the mean Cryptosporidium level under §2411(A)(1), unfiltered systems must provide the level of treatment for Cryptosporidium required under §2411 according to the schedule in subsection (C) of this section.

C. Cryptosporidium treatment compliance dates.

TABLE 2400.6 Cryptosporidium Treatment Compliance Dates

Systems that serve . . .	Must comply with Cryptosporidium treatment requirements no later than . . . [a]
(1) At least 100,000 people	(a) April 1, 2012.
(2) From 50,000 to 99,999 people	(b) October 1, 2012
(3) From 10,000 to 49,999 people	(c) October 1, 2013
(4) Fewer than 10,000 people	(d) October 1, 2014

[a]The Director may allow up to an additional two years for complying with the treatment requirement for systems making capital improvements.

D. If the bin classification for a filtered system changes following the second round of source water monitoring, as determined under §2409(D), the system must provide the level of treatment for Cryptosporidium required under §2410 on a schedule the Director approves.

E. If the mean Cryptosporidium level for an unfiltered system changes following the second round of monitoring, as determined under §2411(A)(2), and if the system must provide a different level of Cryptosporidium treatment under §2411 due to this change, the system must meet this treatment requirement on a schedule the Director approves.

§2413 Requirements for uncovered finished water storage facilities

A. Systems using uncovered finished water storage facilities must comply with the conditions of this section.

B. Systems must notify the Director of the use of each uncovered finished water storage facility no later than April 1, 2008.

C. Systems must meet the conditions of paragraph (C)(1) or (2) of this section for each uncovered finished water storage facility or be in compliance with a Director-approved schedule to meet these conditions no later than April 1, 2009.

1. Systems must cover any uncovered finished water storage facility.

2. Systems must treat the discharge from the uncovered finished water storage facility to the distribution system to achieve inactivation and/or removal of at least 4-log virus, 3-log Giardia lamblia, and 2-log Cryptosporidium using a protocol approved by the Director.

D. Failure to comply with the requirements of this section is a violation of the treatment technique requirement.

Requirements for Microbial Toolbox Components

§2414 Microbial toolbox options for meeting *Cryptosporidium* treatment requirements

E. 1. Systems receive the treatment credits listed in Table 2400.7 by meeting the conditions for microbial toolbox options described in §2415 through §2419. Systems apply these treatment credits to meet the treatment requirements in §2410 or §2411, as applicable.

2. Unfiltered systems are eligible for treatment credits for the microbial toolbox options described in §2419 only.

F. The following table summarizes options in the microbial toolbox:

TABLE 2400.7 Microbial Toolbox Summary Table: Options, Treatment Credits and Criteria

Toolbox Option	*Cryptosporidium* treatment credit with design and implementation criteria
Source Protection and Management Toolbox Options	
(1) Watershed control program	0.5-log credit for Director-approved program comprising required elements, annual program status report to Director, and regular watershed survey. Unfiltered systems are not eligible for credit. Specific criteria are in §2415(A).

(2) Alternative source/intake management	No prescribed credit. Systems may conduct simultaneous monitoring for treatment bin classification at alternative intake locations or under alternative intake management strategies. Specific criteria are in §2415(B).
Pre Filtration Toolbox Options	
(3) Presedimentation basin with coagulation	0.5-log credit during any month that presedimentation basins achieve a monthly mean reduction of 0.5-log or greater in turbidity or alternative Director-approved performance criteria. To be eligible, basins must be operated continuously with coagulant addition and all plant flow must pass through basins. Specific criteria are in §2416(A).
(4) Two-stage lime softening	0.5-log credit for two-stage softening where chemical addition and hardness precipitation occur in both stages. All plant flow must pass through both stages. Single-stage softening is credited as equivalent to conventional treatment. Specific criteria are in §2416(B).
(5) Bank filtration	0.5-log credit for 25-foot setback; 1.0- log credit for 50-foot setback; aquifer must be unconsolidated sand containing at least 10 percent fines; average turbidity in wells must be less than 1 NTU. Systems using wells followed by filtration when conducting source water monitoring must sample the well to determine bin classification and are not eligible for additional credit. Specific criteria are in §2418(C).
Treatment Performance Toolbox Options	
(6) Combined filter performance	0.5-log credit for combined filter effluent turbidity less than or equal to 0.15 NTU in at least 95 percent of measurements each month. Specific criteria are in §2417(A).
(7) Individual filter performance.	0.5-log credit (in addition to 0.5-log combined filter performance credit) if individual filter effluent turbidity is less than or equal to 0.15 NTU in at least 95 percent of samples each month in each filter and is never greater than 0.3 NTU in two consecutive measurements in any filter. Specific criteria are in §2417(B).
(8) Demonstration of performance	Credit awarded to unit process or treatment train based on a demonstration to the Director with a Director-approved protocol. Specific criteria are in §2417(C).
Additional Filtration Toolbox Options	
(9) Bag or cartridge filters (individual filters)	Up to 2-log credit based on the removal efficiency demonstrated during challenge testing with a 1.0-log factor of safety. Specific criteria are in §2418(A).
(10) Bag or cartridge filters (in series)	Up to 2.5-log credit based on the removal efficiency demonstrated during challenge testing with a 0.5-log factor of safety. Specific criteria are in §2418(A).
(11) Membrane filtration	Log credit equivalent to removal efficiency demonstrated in challenge test for device if supported by direct integrity testing. Specific criteria are in §2418(B).
(12) Second stage filtration.	0.5-log credit for second separate granular media filtration stage if treatment train includes coagulation prior to first filter. Specific criteria are in §2418(C).

(13) Slow sand filters	2.5-log credit as a secondary filtration step; 3.0-log credit as a primary filtration process. No prior chlorination for either option. Specific criteria are in §2418(D).
Inactivation Toolbox Options	
(14) Chlorine dioxide	Log credit based on measured CT in relation to CT table. Specific criteria are in §2419(B) .
(15) Ozone	Log credit based on measured CT in relation to CT table. Specific criteria are in §2419(B).
(16) UV	Log credit based on validated UV dose in relation to UV dose table; reactor validation testing required to establish UV dose and associated operating conditions. Specific criteria are in §2419(D).

§2415 Source toolbox components

A. Watershed control program. Systems receive 0.5-log Cryptosporidium treatment credit for implementing a watershed control program that meets the requirements of this section.

1. Systems that intend to apply for the watershed control program credit must notify the Director of this intent no later than two years prior to the treatment compliance date applicable to the system in §2412.

2. Systems must submit to the Director a proposed watershed control plan no later than one year before the applicable treatment compliance date in §2412. The Director must approve the watershed control plan for the system to receive watershed control program treatment credit. The watershed control plan must include the elements in paragraphs (A)(2)(a) through (d) of this section.

   a. Identification of an "area of influence" outside of which the likelihood of Cryptosporidium or fecal contamination affecting the treatment plant intake is not significant. This is the area to be evaluated in future watershed surveys under paragraph (A)(5)(b) of this section.

   b. Identification of both potential and actual sources of Cryptosporidium contamination and an assessment of the relative impact of these sources on the system's source water quality.

   c. An analysis of the effectiveness and feasibility of control measures that could reduce Cryptosporidium loading from sources of contamination to the system's source water.

   d. A statement of goals and specific actions the system will undertake to reduce source water Cryptosporidium levels. The plan must explain how the actions are expected to contribute to specific goals, identify watershed partners and their roles, identify resource requirements and commitments, and include a schedule for plan implementation with deadlines for completing specific actions identified in the plan.

3. Systems with existing watershed control programs (i.e., programs in place on January 5, 2006) are eligible to seek this credit. Their watershed control plans must meet the criteria in paragraph (A)(2) of this section and must specify ongoing and future actions that will reduce source water Cryptosporidium levels.

4. If the Director does not respond to a system regarding approval of a watershed control plan submitted under this section and the system meets the other requirements of this section, the watershed control program will be considered approved and 0.5 log Cryptosporidium treatment credit will be awarded unless and until the Director subsequently withdraws such approval.

5. Systems must complete the actions in paragraphs (A)(5)(a) through (c) of this section to maintain the 0.5-log credit.

   a. Submit an annual watershed control program status report to the Director. The annual watershed control program status report must describe the system's implementation of the approved plan and assess the adequacy of the plan to meet its goals. It must explain how the system is addressing any shortcomings in plan

implementation, including those previously identified by the Director or as the result of the watershed survey conducted under paragraph (A)(5)(b) of this section. It must also describe any significant changes that have occurred in the watershed since the last watershed sanitary survey. If a system determines during implementation that making a significant change to its approved watershed control program is necessary, the system must notify the Director prior to making any such changes. If any change is likely to reduce the level of source water protection, the system must also list in its notification the actions the system will take to mitigate this effect.

b. Undergo a watershed sanitary survey every three years for community water systems and every five years for noncommunity water systems and submit the survey report to the Director. The survey must be conducted according to Director guidelines and by persons the Director approves.

i. The watershed sanitary survey must meet the following criteria: encompass the region identified in the Director-approved watershed control plan as the area of influence; assess the implementation of actions to reduce source water Cryptosporidium levels; and identify any significant new sources of Cryptosporidium.

ii. If the Director determines that significant changes may have occurred in the watershed since the previous watershed sanitary survey, systems must undergo another watershed sanitary survey by a date the Director requires, which may be earlier than the regular date in paragraph (A)(5)(b) of this section.

c. The system must make the watershed control plan, annual status reports, and watershed sanitary survey reports available to the public upon request. These documents must be in a plain language style and include criteria by which to evaluate the success of the program in achieving plan goals. The Director may approve systems to withhold from the public portions of the annual status report, watershed control plan, and watershed sanitary survey based on water supply security considerations.

6. If the Director determines that a system is not carrying out the approved watershed control plan, the Director may withdraw the watershed control program treatment credit.

B. Alternative source.

1. A system may conduct source water monitoring that reflects a different intake location (either in the same source or for an alternate source) or a different procedure for the timing or level of withdrawal from the source (alternative source monitoring). If the Director approves, a system may determine its bin classification under §2409 based on the alternative source monitoring results.

2. If systems conduct alternative source monitoring under paragraph (B)(1) of this section, systems must also monitor their current plant intake concurrently as described in §2402.

3. Alternative source monitoring under paragraph (B)(1) of this section must meet the requirements for source monitoring to determine bin classification, as described in §§2402 through 2405 and Appendix G 2401-G through 2402-G. Systems must report the alternative source monitoring results to the Director, along with supporting information documenting the operating conditions under which the samples were collected.

4. If a system determines its bin classification under §2409 using alternative source monitoring results that reflect a different intake location or a different procedure for managing the timing or level of withdrawal from the source, the system must relocate the intake or permanently adopt the withdrawal procedure, as applicable, no later than the applicable treatment compliance date in §2412.

§2416 Pre-filtration treatment toolbox components

A. Presedimentation. Systems receive 0.5-log Cryptosporidium treatment credit for a presedimentation basin during any month the process meets the criteria in this subsection.

1. The presedimentation basin must be in continuous operation and must treat the entire plant flow taken from a surface water or GWUDI source.

2. The system must continuously add a coagulant to the presedimentation basin.

3. The presedimentation basin must achieve the performance criteria in paragraph (3)(a) or (b) of this section.

a. Demonstrates at least 0.5-log mean reduction of influent turbidity. This reduction must be determined using daily turbidity measurements in the presedimentation process influent and effluent and must be calculated as follows: log10 (monthly mean of daily influent turbidity)-log10 (monthly mean of daily effluent turbidity).

b. Complies with Director-approved performance criteria that demonstrate at least 0.5-log mean removal of micron-sized particulate material through the presedimentation process.

B. Two-stage lime softening. Systems receive an additional 0.5-log Cryptosporidium treatment credit for a two-stage lime softening plant if chemical addition and hardness precipitation occur in two separate and sequential softening stages prior to filtration. Both softening stages must treat the entire plant flow taken from a surface water or GWUDI source.

C. Bank filtration. Systems receive Cryptosporidium treatment credit for bank filtration that serves as pretreatment to a filtration plant by meeting the criteria in this subsection. Systems using bank filtration when they begin source water monitoring under §2402 (A) must collect samples as described in § 2404 (D) and are not eligible for this credit.

1. Wells with a ground water flow path of at least 25 feet receive 0.5-log treatment credit; wells with a ground water flow path of at least 50 feet receive 1.0-log treatment credit. The ground water flow path must be determined as specified in paragraph (C)(4) of this section.

2. Only wells in granular aquifers are eligible for treatment credit. Granular aquifers are those comprised of sand, clay, silt, rock fragments, pebbles or larger particles, and minor cement. A system must characterize the aquifer at the well site to determine aquifer properties. Systems must extract a core from the aquifer and demonstrate that in at least 90 percent of the core length, grains less than 1.0 mm in diameter constitute at least 10 percent of the core material.

3. Only horizontal and vertical wells are eligible for treatment credit.

4. For vertical wells, the ground water flow path is the measured distance from the edge of the surface water body under high flow conditions (determined by the 100 year floodplain elevation boundary or by the floodway, as defined in Federal Emergency Management Agency flood hazard maps) to the well screen. For horizontal wells, the ground water flow path is the measured distance from the bed of the river under normal flow conditions to the closest horizontal well lateral screen.

5. Systems must monitor each wellhead for turbidity at least once every four hours while the bank filtration process is in operation. If monthly average turbidity levels, based on daily maximum values in the well, exceed 1 NTU, the system must report this result to the Director and conduct an assessment within 30 days to determine the cause of the high turbidity levels in the well. If the Director determines that microbial removal has been compromised, the Director may revoke treatment credit until the system implements corrective actions approved by the Director to remediate the problem.

6. Springs and infiltration galleries are not eligible for treatment credit under this section, but are eligible for credit under §2419(C).

7. Bank filtration demonstration of performance. The Director may approve Cryptosporidium treatment credit for bank filtration based on a demonstration of performance study that meets the criteria in this subsection. This treatment credit may be greater than 1.0-log and may be awarded to bank filtration that does not meet the criteria in paragraphs (C)(1)-(5) of this section.

a. The study must follow a Director-approved protocol and must involve the collection of data on the removal of Cryptosporidium or a surrogate for Cryptosporidium and related hydrogeologic and water quality parameters during the full range of operating conditions.

b. The study must include sampling both from the production well(s) and from monitoring wells that are screened and located along the shortest flow path between the surface water source and the production well(s).

§2417 Treatment performance toolbox components

A. Combined filter performance. Systems using conventional filtration treatment or direct filtration treatment receive an additional 0.5-log Cryptosporidium treatment credit during any month the system meets the criteria in this subsection. Combined filter effluent (CFE) turbidity

must be less than or equal to 0.15 NTU in at least 95 percent of the measurements. Turbidity must be measured as described in Appendix D-801-D (A) and (C).

B. Individual filter performance. Systems using conventional filtration treatment or direct filtration treatment receive 0.5-log Cryptosporidium treatment credit, which can be in addition to the 0.5-log credit under subsection (A) of this section, during any month the system meets the criteria in this subsection. Compliance with these criteria must be based on individual filter turbidity monitoring as described in §1306 or §2107, as applicable.

1. The filtered water turbidity for each individual filter must be less than or equal to 0.15 NTU in at least 95 percent of the measurements recorded each month.

2. No individual filter may have a measured turbidity greater than 0.3 NTU in two consecutive measurements taken 15 minutes apart.

3. Any system that has received treatment credit for individual filter performance and fails to meet the requirements of paragraph (B)(1) or (2) of this section during any month does not receive a treatment technique violation under §2412(C) if the Director determines the following:

a. The failure was due to unusual and short-term circumstances that could not reasonably be prevented through optimizing treatment plant design, operation, and maintenance.

b. The system has experienced no more than two such failures in any calendar year.

C. Demonstration of performance. The Director may approve Cryptosporidium treatment credit for drinking water treatment processes based on a demonstration of performance study that meets the criteria in this subsection. This treatment credit may be greater than or less than the prescribed treatment credits in §2410 or §2416 through §2419 and may be awarded to treatment processes that do not meet the criteria for the prescribed credits.

1. Systems cannot receive the prescribed treatment credit for any toolbox option in §2416 through §2419 if that toolbox option is included in a demonstration of performance study for which treatment credit is awarded under this subsection.

2. The demonstration of performance study must follow a Director-approved protocol and must demonstrate the level of Cryptosporidium reduction the treatment process will achieve under the full range of expected operating conditions for the system.

3. Approval by the Director must be in writing and may include monitoring and treatment performance criteria that the system must demonstrate and report on an ongoing basis to remain eligible for the treatment credit. The Director may designate such criteria where necessary to verify that the conditions under which the demonstration of performance credit was approved are maintained during routine operation.

§2418 Additional filtration toolbox components

A. Bag and cartridge filters. Systems receive Cryptosporidium treatment credit of up to 2.0-log for individual bag or cartridge filters and up to 2.5-log for bag or cartridge filters operated in series by meeting the criteria in paragraphs (A)(1) through (10) of this section. To be eligible for this credit, systems must report the results of challenge testing that meets the requirements of paragraphs (A)(2) through (9) of this section to the Director. The filters must treat the entire plant flow taken from a Part VIII source.

1. The Cryptosporidium treatment credit awarded to bag or cartridge filters must be based on the removal efficiency demonstrated during challenge testing that is conducted according to the criteria in paragraphs (A)(2) through (A)(9) of this section. A factor of safety equal to 1-log for individual bag or cartridge filters and 0.5-log for bag or cartridge filters in series must be applied to challenge testing results to determine removal credit. Systems may use results from challenge testing conducted prior to January 5, 2006 if the prior testing was consistent with the criteria specified in paragraphs (A)(2) through (9) of this section.

2. Challenge testing must be performed on full-scale bag or cartridge filters, and the associated filter housing or pressure vessel, that are identical in material and construction to the filters and housings the system will use for removal of Cryptosporidium. Bag or cartridge filters must be challenge tested in the same configuration that the system will use, either as individual filters or as a series configuration of filters.

3. Challenge testing must be conducted using Cryptosporidium or a surrogate that is removed

no more efficiently than Cryptosporidium. The microorganism or surrogate used during challenge testing is referred to as the challenge particulate. The concentration of the challenge particulate must be determined using a method capable of discreetly quantifying the specific microorganism or surrogate used in the test; gross measurements such as turbidity may not be used.

4. The maximum feed water concentration that can be used during a challenge test must be based on the detection limit of the challenge particulate in the filtrate (i.e., filtrate detection limit) and must be calculated using the following equation:

Maximum Feed Concentration = $1 \times 10^4 \times$(Filtrate Detection Limit)

5. Challenge testing must be conducted at the maximum design flow rate for the filter as specified by the manufacturer.

6. Each filter evaluated must be tested for a duration sufficient to reach 100 percent of the terminal pressure drop, which establishes the maximum pressure drop under which the filter may be used to comply with the requirements of this part.

7. Removal efficiency of a filter must be determined from the results of the challenge test and expressed in terms of log removal values using the following equation:

$$LRV = LOG_{10}(C_f) - LOG_{10}(C_p)$$

Where:
LRV = log removal value demonstrated during challenge testing;
C_f = the feed concentration measured during the challenge test; and
C_p = the filtrate concentration measured during the challenge test.
In applying this equation, the same units must be used for the feed and filtrate concentrations. If the challenge particulate is not detected in the filtrate, then the term C_p must be set equal to the detection limit.

8. Each filter tested must be challenged with the challenge particulate during three periods over the filtration cycle: within two hours of start-up of a new filter; when the pressure drop is between 45 and 55 percent of the terminal pressure drop; and at the end of the cycle after the pressure drop has reached 100 percent of the terminal pressure drop. An LRV must be calculated for each of these challenge periods for each filter tested. The LRV for the filter (LRV_{filter}) must be assigned the value of the minimum LRV observed during the three challenge periods for that filter.

9. If fewer than 20 filters are tested, the overall removal efficiency for the filter product line must be set equal to the lowest LRV_{filter} among the filters tested. If 20 or more filters are tested, the overall removal efficiency for the filter product line must be set equal to the 10th percentile of the set of LRVfilter values for the various filters tested. The percentile is defined by (i/(n+1)) where i is the rank of n individual data points ordered lowest to highest. If necessary, the 10th percentile may be calculated using linear interpolation.

10. If a previously tested filter is modified in a manner that could change the removal efficiency of the filter product line, challenge testing to demonstrate the removal efficiency of the modified filter must be conducted and submitted to the Director.

B. Membrane filtration

1. Systems receive Cryptosporidium treatment credit for membrane filtration that meets the criteria of this subsection. Membrane cartridge filters that meet the definition of membrane filtration in §104 are eligible for this credit. The level of treatment credit a system receives is equal to the lower of the values determined under paragraph (B)(1)(a) and (b) of this section.
   a. The removal efficiency demonstrated during challenge testing conducted under the conditions in paragraph (b)(2) of this section.

   b. The maximum removal efficiency that can be verified through direct integrity testing used with the membrane filtration process under the conditions in paragraph (b)(3) of this section.

2. Challenge Testing. The membrane used by the system must undergo challenge testing to evaluate removal efficiency, and the system must report the results of challenge testing to the Director. Challenge testing must be conducted according to the criteria in paragraphs (B)(2)(a) through (g) of this section. Systems may use data from challenge testing conducted prior to January 5, 2006 if the prior testing was consistent with the criteria in paragraphs (b)(2)(a) through (g) of this section.

a. Challenge testing must be conducted on either a full-scale membrane module, identical in material and construction to the membrane modules used in the system's treatment facility, or a smaller-scale membrane module, identical in material and similar in construction to the full-scale module. A module is defined as the smallest component of a membrane unit in which a specific membrane surface area is housed in a device with a filtrate outlet structure.

b. Challenge testing must be conducted using Cryptosporidium oocysts or a surrogate that is removed no more efficiently than Cryptosporidium oocysts. The organism or surrogate used during challenge testing is referred to as the challenge particulate. The concentration of the challenge particulate, in both the feed and filtrate water, must be determined using a method capable of discretely quantifying the specific challenge particulate used in the test; gross measurements such as turbidity may not be used.

c. The maximum feed water concentration that can be used during a challenge test is based on the detection limit of the challenge particulate in the filtrate and must be determined according to the following equation:

Maximum Feed Concentration = $3.16 \times 10^6 \times$ (Filtrate Detection Limit)

d. Challenge testing must be conducted under representative hydraulic conditions at the maximum design flux and maximum design process recovery specified by the manufacturer for the membrane module. Flux is defined as the throughput of a pressure driven membrane process expressed as flow per unit of membrane area. Recovery is defined as the volumetric percent of feed water that is converted to filtrate over the course of an operating cycle uninterrupted by events such as chemical cleaning or a solids removal process (i.e., backwashing).

e. Removal efficiency of a membrane module must be calculated from the challenge test results and expressed as a log removal value according to the following equation:

$$LRV = LOG_{10}(C_f) - LOG_{10}(C_p)$$

Where:
LRV = log removal value demonstrated during the challenge test;
C_f = the feed concentration measured during the challenge test; and
C_p = the filtrate concentration measured during the challenge test.
Equivalent units must be used for the feed and filtrate concentrations. If the challenge particulate is not detected in the filtrate, the term C_p is set equal to the detection limit for the purpose of calculating the LRV. An LRV must be calculated for each membrane module evaluated during the challenge test.

f. The removal efficiency of a membrane filtration process demonstrated during challenge testing must be expressed as a log removal value ($LRV_{C\text{-}Test}$). If fewer than 20 modules are tested, then $LRV_{C\text{-}Test}$ is equal to the lowest of the representative LRVs among the modules tested. If 20 or more modules are tested, then $LRV_{C\text{-}Test}$ is equal to the 10th percentile of the representative LRVs among the modules tested. The percentile is defined by (i/(n+1)) where i is the rank of n individual data points ordered lowest to highest. If necessary, the 10th percentile may be calculated using linear interpolation.

g. The challenge test must establish a quality control release value (QCRV) for a non-destructive performance test that demonstrates the Cryptosporidium removal capability of the membrane filtration module. This performance test must be applied to each production membrane module used by the system that was not directly challenge tested in order to verify Cryptosporidium removal capability. Production modules that do not meet the established QCRV are not eligible for the treatment credit demonstrated during the challenge test.

h. If a previously tested membrane is modified in a manner that could change the removal efficiency of the membrane or the applicability of the non-destructive performance test and associated QCRV, additional challenge testing to demonstrate the removal efficiency of, and determine a new QCRV for, the modified membrane must be conducted and submitted to the Director.

3. Direct integrity testing. Systems must conduct direct integrity testing in a manner that demonstrates a removal efficiency equal to or greater than the removal credit awarded to the membrane filtration process and meets the requirements described in paragraphs (B)(3)(a) through (f) of this section. A direct integrity test is defined as a physical test applied to a membrane unit in order to identify and isolate integrity breaches (i.e.,

one or more leaks that could result in contamination of the filtrate).

a. The direct integrity test must be independently applied to each membrane unit in service. A membrane unit is defined as a group of membrane modules that share common valving that allows the unit to be isolated from the rest of the system for the purpose of integrity testing or other maintenance.

b. The direct integrity method must have a resolution of 3 micrometers or less, where resolution is defined as the size of the smallest integrity breach that contributes to a response from the direct integrity test.

c. The direct integrity test must have a sensitivity sufficient to verify the log treatment credit awarded to the membrane filtration process by the Director, where sensitivity is defined as the maximum log removal value that can be reliably verified by a direct integrity test. Sensitivity must be determined using the approach in either paragraph (B)(3)(c)(i) or (ii) of this section as applicable to the type of direct integrity test the system uses.

i. For direct integrity tests that use an applied pressure or vacuum, the direct integrity test sensitivity must be calculated according to the following equation:

$$LRV_{DIT} = LOG_{10} (Q_p / (VCF \times Q_{breach}))$$

Where:
LRV_{DIT} = the sensitivity of the direct integrity test;
Q_p = total design filtrate flow from the membrane unit;
Q_{breach} = flow of water from an integrity breach associated with the smallest integrity test response that can be reliably measured, and
VCF = volumetric concentration factor.
The volumetric concentration factor is the ratio of the suspended solids concentration on the high pressure side of the membrane relative to that in the feed water.

ii. For direct integrity tests that use a particulate or molecular marker, the direct integrity test sensitivity must be calculated according to the following equation:

$$LRV_{DIT} = LOG_{10}(C_f) - LOG_{10}(C_p)$$

Where:
LRV_{DIT} = the sensitivity of the direct integrity test;
C_f = the typical feed concentration of the marker used in the test;
and C_p = the filtrate concentration of the marker from an integral membrane unit.

d. Systems must establish a control limit within the sensitivity limits of the direct integrity test that is indicative of an integral membrane unit capable of meeting the removal credit awarded by the Director.

e. If the result of a direct integrity test exceeds the control limit established under paragraph (B)(3)(d) of this section, the system must remove the membrane unit from service. Systems must conduct a direct integrity test to verify any repairs, and may return the membrane unit to service only if the direct integrity test is within the established control limit.

f. Systems must conduct direct integrity testing on each membrane unit at a frequency of not less than once each day that the membrane unit is in operation. The Director may approve less frequent testing, based on demonstrated process reliability, the use of multiple barriers effective for Cryptosporidium, or reliable process safeguards.

4. Indirect integrity monitoring. Systems must conduct continuous indirect integrity monitoring on each membrane unit according to the criteria in paragraphs (B)(4)(a) through (e) of this section. Indirect integrity monitoring is defined as monitoring some aspect of filtrate water quality that is indicative of the removal of particulate matter. A system that implements continuous direct integrity testing of membrane units in accordance with the criteria in paragraphs (B)(3)(a) through (e) of this section is not subject to the requirements for continuous indirect integrity monitoring. Systems must submit a monthly report to the Director summarizing all continuous indirect integrity monitoring results triggering direct integrity testing and the corrective action that was taken in each case.

a. Unless the Director approves an alternative parameter, continuous indirect integrity monitoring must include continuous filtrate turbidity monitoring.

b. Continuous monitoring must be conducted at a frequency of no less than once every 15 minutes.

c. Continuous monitoring must be separately conducted on each membrane unit.

d. If indirect integrity monitoring includes turbidity and if the filtrate turbidity readings are above 0.15 NTU for a period greater than 15 minutes (i.e., two consecutive 15-minute readings above 0.15 NTU), direct integrity testing must immediately be performed on the associated membrane unit as specified in paragraphs (B)(3)(a) through (e) of this section.

e. If indirect integrity monitoring includes a Director-approved alternative parameter and if the alternative parameter exceeds a Director-approved control limit for a period greater than 15 minutes, direct integrity testing must immediately be performed on the associated membrane units as specified in paragraphs (B)(3)(a) through (e) of this section.

C. Second stage filtration. Systems receive 0.5-log Cryptosporidium treatment credit for a separate second stage of filtration that consists of sand, dual media, GAC, or other fine grain media following granular media filtration if the Director approves. To be eligible for this credit, the first stage of filtration must be preceded by a coagulation step and both filtration stages must treat the entire plant flow taken from a surface water or GWUDI source. A cap, such as GAC, on a single stage of filtration is not eligible for this credit. The Director must approve the treatment credit based on an assessment of the design characteristics of the filtration process.

D. Slow sand filtration (as secondary filter). Systems are eligible to receive 2.5-log Cryptosporidium treatment credit for a slow sand filtration process that follows a separate stage of filtration if both filtration stages treat entire plant flow taken from a surface water or GWUDI source and no disinfectant residual is present in the influent water to the slow sand filtration process. The Director must approve the treatment credit based on an assessment of the design characteristics of the filtration process. This subsection does not apply to treatment credit awarded to slow sand filtration used as a primary filtration process.

§2419 Inactivation toolbox components

A. Calculation of CT values.

1. CT is the product of the disinfectant contact time (T, in minutes) and disinfectant concentration (C, in milligrams per liter). Systems with treatment credit for chlorine dioxide or ozone under subsection (b) or (c) of this section must calculate CT at least once each day, with both C and T measured during peak hourly flow as specified in Appendix D-801-D (A) through (B).

2. Systems with several disinfection segments in sequence may calculate CT for each segment, where a disinfection segment is defined as a treatment unit process with a measurable disinfectant residual level and a liquid volume. Under this approach, systems must add the Cryptosporidium CT values in each segment to determine the total CT for the treatment plant.

B. CT values for chlorine dioxide and ozone.

1. Systems receive the Cryptosporidium treatment credit listed in Table 2400.8 by meeting the corresponding chlorine dioxide CT value for the applicable water temperature, as described in subsection (a) of this section.

TABLE 2400.8 CT Values (mg-min/L) for Cryptosporidium Inactivation by Chlorine Dioxide[1]

	Water Temperature, °C										
Log credit	≤.5	1	2	3	5	7	10	15	20	25	30
(a) 0.25	159	153	140	128	107	90	69	45	29	19	12
(b) 0.5	319	305	279	256	214	180	138	89	58	38	24
(c) 1.0	637	610	558	511	429	360	277	179	116	75	49
(d)1.5	956	915	838	767	643	539	415	268	174	113	73

(e)2.0	1275	1220	1117	1023	858	719	553	357	232	150	98
(f) 2.5	1594	1525	1396	1278	1072	899	691	447	289	188	122
(g) 3.0	1912	1830	1675	1534	1286	1079	830	536	347	226	147

[1]Systems may use this equation to determine log credit between the indicated values: Log credit = $(0.001506 \times (1.09116)^{Temp}) \times CT$.

2. Systems receive the Cryptosporidium treatment credit listed in Table 2400.9 by meeting the corresponding ozone CT values for the applicable water temperature, as described in subsection (A) of this section.

TABLE 2400.9 CT Values (mg-min/L) for Cryptosporidium Inactivation by Ozone[1]

	Water Temperature, °C										
Log credit	≤0.5	1	2	3	5	7	10	15	20	25	30
(a) 0.25	6.0	5.8	5.2	4.8	4.0	3.3	2.5	1.6	1.0	0.6	0.39
(b) 0.5	12	12	10	9.5	7.9	6.5	4.9	3.1	2.0	1.2	0.78
(c) 1.0	24	23	21	19	16	13	9.9	6.2	3.9	2.5	1.6
(d) 1.5	36	35	31	29	24	20	15	9.3	5.9	3.7	2.4
(e) 2.0	48	46	42	38	32	26	20	12	7.8	4.9	3.1
(f) 2.5	60	58	52	48	40	33	25	16	9.8	6.2	3.9
(g) 3.0	72	69	63	57	47	39	30	19	12	7.4	4.7

[1]Systems may use this equation to determine log credit between the indicated values: Log credit = $(0.0397 \times (1.09757)^{Temp}) \times CT$.

C. Site-specific study. The Director may approve alternative chlorine dioxide or ozone CT values to those listed in subsection (B) of this section on a site-specific basis. The Director must base this approval on a site-specific study a system conducts that follows a Director-approved protocol.

D. Ultraviolet light. Systems receive Cryptosporidium, Giardia lamblia, and virus treatment credits for ultraviolet (UV) light reactors by achieving the corresponding UV dose values shown in Table 2400.10. Systems must validate and monitor UV reactors as described in paragraphs (D)(2) and (3) of this section to demonstrate that they are achieving a particular UV dose value for treatment credit.

1. UV dose table. The treatment credits listed in this table are for UV light at a wavelength of 254 nm as produced by a low pressure mercury vapor lamp. To receive treatment credit for other lamp types, systems must demonstrate an equivalent germicidal dose through reactor validation testing, as described in paragraph (D)(2) of this section. The UV dose values in this table are applicable only to post-filter applications of UV in filtered systems and to unfiltered systems.

TABLE 2400.10 UV Dose Table for Cryptosporidium, Giardia lamblia, and Virus Inactivation Credit

Log credit	Cryptosporidium UV dose (mJ/cm^2)	Giardia lamblia UV dose (mJ/cm^2)	Virus UV dose (mJ/cm^2)
(a) 0.5	1.6	1.5	39
(b) 1.0	2.5	2.1	58
(c) 1.5	3.9	3.0	79

(d) 2.0	5.8	5.2	100
(e) 2.5	8.5	7.7	121
(f) 3.0	12	11	143
(g) 3.5	15	15	163
(h) 4.0	22	22	186

2. Reactor validation testing. Systems must use UV reactors that have undergone validation testing to determine the operating conditions under which the reactor delivers the UV dose required in paragraph (D)(1) of this section (i.e., validated operating conditions). These operating conditions must include flow rate, UV intensity as measured by a UV sensor, and UV lamp status.

   a. When determining validated operating conditions, systems must account for the following factors: UV absorbance of the water; lamp fouling and aging; measurement uncertainty of on-line sensors; UV dose distributions arising from the velocity profiles through the reactor; failure of UV lamps or other critical system components; and inlet and outlet piping or channel configurations of the UV reactor.

   b. Validation testing must include the following: Full scale testing of a reactor that conforms uniformly to the UV reactors used by the system and inactivation of a test microorganism whose dose response characteristics have been quantified with a low pressure mercury vapor lamp.

   c. The Director may approve an alternative approach to validation testing.

3. Reactor monitoring.

   a. Systems must monitor their UV reactors to determine if the reactors are operating within validated conditions, as determined under paragraph (D)(2) of this section. This monitoring must include UV intensity as measured by a UV sensor, flow rate, lamp status, and other parameters the Director designates based on UV reactor operation. Systems must verify the calibration of UV sensors and must recalibrate sensors in accordance with a protocol the Director approves.

   b. To receive treatment credit for UV light, systems must treat at least 95 percent of the water delivered to the public during each month by UV reactors operating within validated conditions for the required UV dose, as described in paragraphs (D)(1) and (2) of this section. Systems must demonstrate compliance with this condition by the monitoring required under paragraph (D)(3)(a) of this section.

Reporting and Recordkeeping Requirements

§2420 Reporting requirements

A. Systems must report sampling schedules under §2403 and source water monitoring results under §2405 unless they notify the Director that they will not conduct source water monitoring due to meeting the criteria of §2402.

B. Systems must report the use of uncovered finished water storage facilities to the Director as described in §2413.

C. Filtered systems must report their Cryptosporidium bin classification as described in §2409.

D. Unfiltered systems must report their mean source water Cryptosporidium level as described in §2411.

E. Systems must report disinfection profiles and benchmarks to the Director as described in §2407 through §2408 prior to making a significant change in disinfection practice.

F. Systems must report to the Director in accordance with Table 2400.11 for any microbial toolbox options used to comply with treatment requirements under §2410 or §2411. Alternatively, the Director may approve a system to certify operation within required parameters for treatment credit rather than reporting monthly operational data for toolbox options.

TABLE 2400.11 Microbial Toolbox Reporting Requirements

Toolbox option	Systems must submit the following information	On the following schedule
(1) Watershed control program (WCP)	(a) Notice of intention to develop a new or continue an existing watershed control program	No later than two years before the applicable treatment compliance date in §2412.
	(b) Watershed control plan	No later than one year before the applicable treatment compliance date in §2412.
	(c)Annual watershed control program status report	Every 12 months, beginning one year after the applicable treatment compliance date in §2412.
	(d) Watershed sanitary survey report	For community water systems, every three years beginning three years after the applicable treatment compliance date in §2412. For noncommunity water systems, every five years beginning five years after the applicable treatment compliance date in §2412.
(2) Alternative source/intake management.	Verification that system has relocated the intake or adopted the intake withdrawal procedure reflected in monitoring results	No later than the applicable treatment compliance date in §2412.
(3) Presedimentation	Monthly verification of the following: (a) Continuous basin operation (b)Treatment of 100% of the flow (c) Continuous addition of coagulant (d) At least 0.5-log mean reduction of influent turbidity or compliance with alternative Director-approved performance criteria.	Monthly reporting within 10 days following the month in which the monitoring was conducted, beginning on the applicable treatment compliance date in §2412.
(4) Two-stage lime softening	Monthly verification of the following: (a) Chemical addition and hardness precipitation occurred in two separate and sequential softening stages prior to filtration (b) Both stages treated with 100% of the plant flow.	Monthly reporting within 10 days following the month in which the monitoring was conducted, beginning on the applicable treatment compliance date in §2412.
(5) Bank filtration	(a) Initial demonstration of the following : (i) Unconsolidated, predominantly sandy aquifer (ii) Setback distance of at least 25 ft. (0.5-log credit) or 50 ft. (1.0-log credit)	No later than the applicable treatment compliance date in §2412.
	(b) If monthly average of daily max turbidity is greater than 1 NTU then system must report result and submit an assessment of the cause.	Report within 30 days following the month in which the monitoring was conducted, beginning on the applicable treatment compliance date in §2412.
(6) Combined filter performance.	Monthly verification of combined filter effluent (CFE) turbidity levels less than or equal to 0.15 NTU in at least 95 percent of the 4 hour CFE measurements taken each month.	Monthly reporting within 10 days following the month in which the monitoring was conducted, beginning on the applicable treatment compliance date in §2412.
(7) Individual filter performance.	Monthly verification of the following: (i) Individual filter effluent (IFE) turbidity levels less than or equal to 0.15 NTU in at least 95 percent of	Monthly reporting within 10 days following the month in which the monitoring was conducted, beginning on the applicable

	samples each month in each filter (ii) No individual filter greater than 0.3 NTU in two consecutive readings 15 minutes apart	treatment compliance date in §2412.
(8) Demonstration of Performance	(a) Results from testing following a Director- approved protocol.	No later than the applicable treatment compliance date in §2412.
	(b) As required by the Director, monthly verification of operation within conditions of Director approval for demonstration of performance credit.	Within 10 days following the month in which monitoring was conducted, beginning on the applicable treatment compliance date in §2412,
(9) Bag filters and cartridge filters	(a) Demonstration that the following criteria are met: (i) Process meets the definition of bag or cartridge filtration; (ii) Removal efficiency established through challenge testing that meets criteria in this part.	No later than the applicable treatment compliance date in §2412.
	(b) Monthly verification that 100% of plant flow was filtered.	Within 10 days following the month in which monitoring was conducted, beginning on the applicable treatment compliance date in §2412.
(10) Membrane Filtration	(a) Results of verification testing demonstrating the following: (i) Removal efficiency established through challenge testing that meets criteria in this part; (ii) Integrity test method and parameters, including resolution, sensitivity, test frequency, control limits, and associated baseline.	No later than the applicable treatment compliance date in §2412.
	(b) Monthly report summarizing the following: (i) All direct integrity tests above the control limit; (ii) If applicable, any turbidity or alternative Direct-approved indirect integrity monitoring results triggering direct integrity testing and the corrective action that was taken.	Within 10 days following the month in which monitoring was conducted, beginning on the applicable treatment compliance date in §2412.
(11) Second Stage filtration	Monthly verification that 100% of flow was filtered through both stages and that first stage was preceded by coagulation step.	Within 10 days following the month in which monitoring was conducted, beginning on the applicable treatment compliance date in §2412.
(12) Slow sand filtration (as secondary filter)	Monthly verification that both a slow sand filter and a preceding separate stage of filtration treated 100% of flow from Part VIII sources.	Within 10 days following the month in which monitoring was conducted, beginning on the applicable treatment compliance date in §2412.
(13) Chlorine dioxide	Summary of CT values for each day as described in §2419	Within 10 days following the month in which monitoring was conducted, beginning on the applicable treatment compliance date in §2412.
(14) Ozone	Summary of CT values for each day as described in §2419	Within 10 days following the month in which monitoring was conducted, beginning on the applicable treatment compliance date in §2412.
	(a) Validation test results	No later than the applicable

(15) UV	demonstrating operating conditions that achieve required UV dose.	treatment compliance date in §2412.
	(b) Monthly reporting summarizing the percentage of water entering the distribution system that was not treated by UV reactors operating within validated conditions for the required dose as specified in §2419(D).	Within 10 days following the month in which monitoring was conducted, beginning on the applicable treatment compliance date in §2412.

§2421 Recordkeeping requirements

A. Systems must keep results from the initial round of source water monitoring under §2402 (A) and the second round of source water monitoring under §2402 (B) until 3 years after bin classification under §2409 for filtered systems or determination of the mean Cryptosporidium level under §2409 for unfiltered systems for the particular round of monitoring.

B. Systems must keep for 3 years any notification to the Director that they will not conduct source water monitoring due to meeting the criteria of §2402(D).

C. Systems must keep the results of treatment monitoring associated with microbial toolbox options under §2415 through §2419 and with uncovered finished water reservoirs under §2413, as applicable, for 3 years.

Requirements for Sanitary Surveys Performed by PWSSP

§2422 Requirements to respond to significant deficiencies identified in sanitary surveys performed by PWSSP

A. A sanitary survey is an onsite review of the water source (identifying sources of contamination by using results of source water assessments where available), facilities, equipment, operation, maintenance, and monitoring compliance of a PWS to evaluate the adequacy of the PWS, its sources and operations, and the distribution of safe drinking water.

B. For the purposes of this section, a significant deficiency includes a defect in design, operation, or maintenance, or a failure or malfunction of the sources, treatment, storage, or distribution system that PWSSP determines to be causing, or has the potential for causing the introduction of contamination into the water delivered to consumers.

C. For sanitary surveys performed by PWSSP, systems must respond in writing to significant deficiencies identified in sanitary survey reports no later than 45 days after receipt of the report, indicating how and on what schedule the system will address significant deficiencies noted in the survey.

D. Systems must correct significant deficiencies identified in sanitary survey reports according to the schedule approved by PWSSP, or if there is no approved schedule, according to the schedule reported under subsection (C) of this section if such deficiencies are within the control of the system.

Part XXV
Groundwater

§2501 Groundwater Sampling and Analytical Requirements

A. Applicability

This part applies to all groundwater systems, which are defined as all public water systems that use groundwater, including consecutive systems receiving finished groundwater, except for public water systems that combine all of their groundwater with surface water or with groundwater under the direct influence of surface water prior to treatment under Part 700 of these regulations.

B. General Requirements.

All groundwater systems must comply with the following requirements:

1. Sanitary survey information requirements for all groundwater systems as described in §303.

2. Microbial source water monitoring requirements for groundwater systems that do not treat all of their groundwater to at least 99.99% (4-log) treatment of viruses (using inactivation or removal) before or at the first customer as described in §2503.

3. Treatment technique requirements, described in §2504, that apply to groundwater systems that have fecally contaminated source waters, as determined by source water monitoring conducted under §2503, or that have significant deficiencies that are identified by the Director. A groundwater system with fecally contaminated source water or with significant deficiencies subject to the treatment technique requirements of this part must implement one or more of the following corrective action options;

   a. correct all significant deficiencies;
   b. provide an alternate source of water;
   c. eliminate the source of contamination; or
   d. provide treatment that reliably achieves at least 4-log treatment of viruses (using inactivation, removal, or an approved combination of 4-log virus inactivation and removal) before or at the first customer.

4. Groundwater systems that provide at least 4-log treatment of viruses (using inactivation, removal, or an approved combination of 4-log virus inactivation and removal) before or at the first customer are required to conduct compliance monitoring to demonstrate treatment effectiveness, as described in §2504(b).

5. If requested by the Director, groundwater systems must provide the Director with any existing information that will enable the Director to perform a hydrogeologic sensitivity assessment. For the purposes of this part, "hydrogeologic sensitivity assessment" is a determination of whether groundwater systems obtain water from hydrogeologically sensitive settings.

C. Compliance date.

Unless otherwise noted, groundwater systems must comply with the requirements of this part upon approval of this part by the Navajo Nation Resources Committee.

§2502 Groundwater Source Microbial Monitoring and Analytical Methods.

A. Triggered Source Water Monitoring

1. General requirements

A groundwater system must conduct triggered source water monitoring if the conditions identified in paragraphs (A)(1)(a) and (A)(1)(b) of this section exist.

   a. The system does not provide at least 4-log treatment of viruses (using inactivation, removal, or an approved combination of 4-log virus inactivation and removal) before or at the first customer for each groundwater source; and

   b. The system is notified that a sample collected under §404(A) is total coliform-positive and the sample is not invalidated under §404(D).

2. Sampling Requirements.

A groundwater system must collect, within 24 hours of notification of the total coliform-

positive sample, at least one groundwater source sample from each groundwater source in use at the time the total coliform-positive sample was collected under §404(A), except as provided in paragraph (A)(2)(b) of this section.

a. The Director may extend the 24-hour time limit, on a case-by-case basis, if the system cannot collect the groundwater source water sample within 24 hours due to circumstances beyond its control. In the case of an extension, the Director must specify how much time the system has to collect the sample.

b. If approved by the Director, systems with more than one groundwater source may meet the requirements of this paragraph (A)(2) by sampling a representative groundwater source or sources. If required by the Director, systems must submit for Director approval a triggered source water monitoring plan that identifies one or more groundwater sources that are representative of each monitoring site in the system's sample siting plan under §404(A) and that the system intends to use for representative sampling under this paragraph (A)(2).

c. A groundwater system serving 1,000 people or fewer may use a repeat sample collected from a groundwater source to meet both the requirements of §404(B) and to satisfy the monitoring requirements of paragraph (A)(2) of this section for that groundwater source only if the Director approves the use of E.coli as a fecal indicator for source water monitoring under subsection (A) of this section. If the repeat sample collected from the groundwater source is E-coli positive, the system must comply with paragraph (A)(3) of this section.

3. Additional Requirements.

If the Director does not require corrective action under §2504(A)(2) for a fecal indicator-positive source water sample collected under paragraph (A)(2) of this section that is not invalidated under (D) of this section, the system must collect five additional source water samples from the same source within 24 hours of being notified of the fecal indicator-positive sample.

4. Consecutive and Wholesale Systems.

a. In addition to the other requirements of this subsection (A), a consecutive groundwater system that has a total coliform-positive sample collected under §404(A) must notify the wholesale system(s) within 24 hours of being notified of the total coliform sample.

b. In addition to the other requirements of subsection (A) of this section, a wholesale groundwater system must comply with paragraphs (A)(4)(b)(i) and (A)(4)(b)(ii) of this section.

i. A wholesale groundwater system that receives notice from a consecutive system it serves that a sample collected under §404(A) is total coliform-positive must, within 24 hours of being notified, collect a sample from its groundwater source(s) under paragraph (A)(2) of this section and analyze it for a fecal indicator under subsection (C) of this section.

ii. If the sample collected under paragraph (A)(4)(b)(i) of this section is fecal indicator-positive, the wholesale groundwater system must notify all consecutive systems served by that groundwater source of the fecal indicator source water positive within 24 hours of being notified of the groundwater source sample monitoring result and must meet the requirements of paragraph (A)(3) of this section.

5. Exceptions to the Triggered Source Water Monitoring Requirements.

A groundwater system is not required to comply with the source water monitoring requirements of subsection (A) of this section if either of the following conditions exists:

a. The Director determines, and documents in writing, that the total coliform-positive sample collected under §404(A) is caused by a distribution system deficiency; or

b. The total coliform-positive sample collected under §404(A) is collected at a location that meets Director-approved criteria for distribution system conditions that will cause total coliform-positive samples.

B. Assessment Source Water Monitoring

If required by the Director, groundwater systems must conduct assessment source water monitoring that meets Director-determined requirements for such monitoring. A groundwater system conducting assessment source water monitoring may use a triggered source water sample collected under paragraph (A)(2) of this section to meet the requirements of this subsection (B). Assessment source water monitoring requirements may include:

1. Collection of a total of 12 groundwater source samples that represent each month the system provides groundwater to the public,

2. Collection of samples from each well unless the system obtains written Director approval to conduct monitoring at one or more wells within the groundwater system that are representative of multiple wells used by that system and that draw water from the same hydrogeologic setting,

3. Collection of a standard sample volume of at least 100 mL for fecal indicator analysis regardless of the fecal indicator or analytical method used,

4. Analysis of all groundwater source samples using one of the analytical methods listed in paragraph (C)(2) of this section for the presence of E. coli, enterococci, or coliphage,

5. Collection of groundwater source samples at a location prior to any treatment of the groundwater source unless the Director approves a sampling location after treatment, and

6. Collection of groundwater source samples at the well itself unless the systems's configuration does not allow for sampling at the well itself and the Director approves an alternate sampling location that is representative of the water quality of that well.

C. Analytical Methods.

1. A groundwater system subject to the source water monitoring requirement of subsection (A) of this section must collect a standard sample volume of at least 100mL for fecal indicator analysis regardless of the fecal indicator or analytical method used.

2. A groundwater system must analyze all groundwater sources samples collected under subsection (A) of this section using one of the analytical methods listed in Appendix H for the presence of E. Coli, enterococci, or coliphage.

D. Invalidation of a Fecal Indicator-positive groundwater source sample.

1. A groundwater system may obtain Director invalidation of a fecal indicator-positive groundwater source sample collected under subsection (A) of this section only under the conditions specified in paragraphs (D)(1)(a) and (b) of this section.

   a. The system provides the Director with written notice from the laboratory that improper sample analysis occurred; or

   b. The Director determines and documents in writing that there is substantial evidence that a fecal indicator-positive groundwater source sample is not related to source water quality.

2. If the Director invalidates a fecal indicator-positive groundwater source sample, the groundwater system must collect another source water sample under subsection (A) of this section within 24 hours of being notified by the Director of its invalidation decision and have it analyzed for the same fecal indicator using the analytical methods in Appendix H of these regulations. The Director may extend the 24-hour time limit on a case-by-case basis if the system cannot collect the source water sample within 24 hours due to circumstances beyond its control. In the case of an extension the Director must specify how much time the system has to collect the sample.

E. Sampling Location

1. Any groundwater source sample required under subsection (A) of this section must be collected at a location prior to any treatment of the groundwater source unless the Director approves a sampling location after treatment.

2. If the system's configuration does not allow for sampling at the well itself, the system may collect a sample at a Director approved location to meet the requirements of subsection (A) of this section if the sample is representative of the water quality of that well.

F. New Sources.

If required by the Director, a groundwater system that places a new groundwater source into service after November 30, 2009, must conduct assessment source water monitoring under subsection (B) of this section. If required by the Director, the system must begin monitoring before the groundwater source is used to provide water to the public.

G. Public Notification

A groundwater system with a groundwater source sample collected under subsection (A) or (B) of this section that is fecal indicator-positive and that is not invalidated under subsection (D) of this section, including consecutive systems served by the groundwater source, must conduct public notification under §603.

H. Monitoring Violations

Failure to meet the requirements of subsections (A)-(F) of this section is a monitoring violation and requires the groundwater system to provide public notification under §605.

§2503 Treatment Technique Requirements for Groundwater Systems

A. Groundwater Systems with Significant Deficiencies or Source Water Fecal Contamination

1. The treatment technique requirements of this section must be met by groundwater systems when a significant deficiency is identified or when a groundwater source sample collected under §2503(A)(3) is fecal indicator-positive.

2. If required by the Director, a groundwater system with a groundwater source sample collected under §2503(A)(2), §2503(A)(4), or §2503(B) that is fecal indicator-positive must comply with the treatment technique requirements of this section.

3. When a significant deficiency is identified at a Part 800 public water system that uses both groundwater and surface water or groundwater under the direct influence of surface water, the system must comply with the provisions of this paragraph except in cases where the Director determines that the significant deficiency is in a portion of the distribution system that is served solely by surface water or groundwater under the direct influence of surface water.

4. Unless the Director requires the groundwater system to implement a specific corrective action, the groundwater system must consult with the Director regarding the appropriate corrective action within 30 days of receiving written notice from the Director of a significant deficiency, written notice from a laboratory that a groundwater source sample collected under §2503(A)(3) was found to be fecal indicator-positive, or written notice from the Director that a fecal indicator-positive collected under §2503(A)(2), §2503(A)(4), or §2503(B) requires corrective action. For the purposes of this part, significant deficiencies include, but are not limited to, defects in design, operation, or maintenance, or failure or malfunction of the sources, treatment, storage, or distribution system that the Director determines to be causing, or have potential for causing, the introduction of contamination into the water delivered to consumers.

5. Within 120 days (or earlier if required by the Director) of receiving written notification from the Director of a significant deficiency, written notice from a laboratory that a groundwater source sample collected under §2503(A)(3) was found to be fecal indicator-positive, or written notice from the Director that a fecal indicator-positive sample collected under §2503(A)(2), §2503(A)(4), or §2503(B) requires corrective action, the groundwater system must either:

   a. Have completed corrective action in accordance with applicable PWSSP plan review processes or other guidance or direction, if any, including Director-specified interim measures; or

   b. Be in compliance with a Director-approved corrective action plan and schedule subject to the conditions specified in (A)(5)(b)(i) and (A)(5)(b)(ii) of this section.

      i. Any subsequent modifications to an approved corrective action plan and schedule must also be approved by the Director.

      ii. If the Director specifies interim measures for protection of the public health pending Director approval of the corrective action plan and schedule or pending completion of the corrective action plan, the system must comply with these interim measures as well as with any schedule specified by the Director.

6. Corrective Action Alternatives
Groundwater systems that meet the conditions of paragraph (A)(1) or (A)(2) of this section must implement one or more of the following corrective action alternatives:

a. Correct all significant deficiencies;

b. Provide an alternate source of water;

c. Eliminate the source of contamination; or

d. Provide treatment that reliably achieves at least 4-log treatment of viruses (using inactivation, removal, or a Director-approved combination of 4-log virus inactivation and removal) before or at the first customer for the groundwater source.

7. Special Notice to the Public of Significant Deficiencies or Source Water Fecal Contamination.

a. In addition to the applicable public notification requirements of §2503, a community groundwater system that receives notice from the Director of a significant deficiency or notification of a fecal indicator-positive groundwater source sample that is not invalidated by the Director under §2503(D) must inform the public served by the water system under §1204(H)(6) of the fecal indicator-positive source sample or of any significant deficiency that has not been corrected. The system must continue to inform the public annually until the significant deficiency is corrected or the fecal contamination in the groundwater source is determined by the Director to be corrected under paragraph (A)(5) of this section.

b. In addition to the applicable public notification requirements of §603, a non-community groundwater system that receives notice from the Director of a significant deficiency must inform the public served by the water system in a manner approved by the Director of any significant deficiency that has not been corrected within 12 months of being notified by the Director, or earlier if required by the Director. The system must continue to inform the public annually until the significant deficiency is corrected. The information must include:

i. The nature of the significant deficiency and the date the significant deficiency was identified by the Director;

ii. The Director-approved plan and schedule for correction of the significant deficiency, including interim measures, progress to date, and any interim measures completed; and

iii. For systems with a large proportion of non-English speaking consumers, as determined by the Director, information in the appropriate language(s) regarding the importancé of the notice or a telephone number or address where consumers may contact the system to obtain a translated copy of the notice or assistance in the appropriate language.

c. If required by the Director, a non-community water system with significant deficiencies that have been corrected must inform its customers of the significant deficiencies, how the deficiencies were corrected, and the dates of correction under paragraph (A)(7)(b) of this section.

B. Compliance Monitoring

1. Existing Groundwater Sources

A groundwater system that is not required to meet the source water monitoring requirements of this part for any groundwater source because it provides at least 4-log treatment of viruses (using inactivation, removal, or a Director-approved combination of 4-log virus inactivation and removal) before or at the first customer for any groundwater source before the compliance date of this part, must notify the Director in writing that it provides at least 4-log treatment of viruses (using inactivation, removal, or a Director-approved combination of 4-log virus inactivation and removal) before or at the first customer for the specified groundwater source and being compliance monitoring in accordance with paragraph (B)(3) of this section by the compliance date for this part. Notification to the Director must include engineering, operational, or other information that the Director requests to evaluate the submission. If the system subsequently discontinues 4-log treatment of viruses (using inactivation, removal, or a Director-approved combination of 4-log virus inactivation and removal) before or at the first

customer for a groundwater source, the system must conduct groundwater source monitoring as required under §2503.

2. New Groundwater Sources

A groundwater system that places a groundwater source in service on or after the compliance date for this part that is not required to meet the source water monitoring requirements of this part because the system provides at least 4-log treatment of viruses (using inactivation, removal, or a Director approved combination of 4-log virus inactivation and removal) before or at the first customer for the groundwater source must comply with the requirements of paragraphs (B)(2)(a), (B)(2)(b), and (B)(2)(C) of this section.

a. The system must notify the Director in writing that it provides at least 4-log treatment of viruses (using inactivation, removal, or a Director-approved combination of 4-log virus inactivation and removal) before or at the first customer for the groundwater source. Notification to the Director must include engineering, operational, or other information that the Director requests to evaluate the submission.

b. The system must conduct compliance monitoring as required under §2504(B)(3) of this part within 30 days of placing the source in service.

c. The system must conduct groundwater source monitoring under §2503 if the system subsequently discontinues 4-log treatment of viruses (using inactivation, removal, or a Director-approved combination of 4-log virus inactivation and removal) before or at the first customer for the groundwater source.

3. Monitoring Requirements

A groundwater system subject to the requirements of subsection (A) or paragraph (B)(1) or (B)(2) of this section must monitor the effectiveness and reliability of treatment for that groundwater source before or at the first customer as follows:

a. Chemical Disinfection

i. Groundwater systems serving more than 3,300 people.

A groundwater system that serves more than 3,300 people must continuously monitor the residual disinfectant concentration using analytical methods specified in Appendix D, §801-D (A)(2) at a location approved by the Director and must record the lowest residual disinfectant concentration each day that water from the groundwater source is served to the public. The groundwater system must maintain the Director-determined residual disinfectant concentration every day the groundwater system serves water from the groundwater source to the public. If there is a failure in the continuous monitoring equipment, the groundwater system must conduct grab sampling every four hours until the continuous monitoring equipment is returned to service. The system must resume continuous residual disinfectant monitoring within 14 days.

ii. Groundwater systems serving 3,300 or fewer people.

A groundwater system that serves 3,300 or fewer people must monitor the residual disinfectant concentration using analytical methods specified in Appendix D, §801-D (A)(2) at a location approved by the Director and record the residual disinfection concentration each day that water from the groundwater source is served to the public. The groundwater system must maintain the Director-determined residual disinfectant concentration every day the groundwater system serves water from the groundwater source to the public. The groundwater system must take a daily grab sample during the hour of peak flow or at another time specified by the Director. If any daily grab sample measurement falls below the Director-determined residual disinfectant concentration, the groundwater system must take follow-up samples every four hours until the residual disinfectant concentration is restored to the Director-determined level. Alternatively, a groundwater system that serves 3,300 or fewer people may monitor continuously and meet the requirements of paragraph (B)(3)(a)(i) of this section.

b. Membrane Filtration

A groundwater system that uses membrane filtration to meet the requirements of this

part must monitor the membrane filtration process in accordance with all Director-specified monitoring requirements and must operate the membrane filtration in accordance with all Director-specified compliance requirements. A groundwater system that uses membrane filtration is in compliance with the requirement to achieve at least 4-log removal of viruses when:

i. The membrane has an absolute molecular weight cut-off (MWCO), or an alternate parameter that describes the exclusion characteristics of the membrane, that can reliably achieve at least 4-log removal of viruses;

ii. The membrane process is operated in accordance with Director-specified compliance requirements; and

iii. The integrity of the membrane is intact.

c. Alternative Treatment

A groundwater system that uses a Director-approved alternative treatment to meet the requirements of this part by providing at least 4-log treatment of viruses (using inactivation, removal, or a Director-approved combination of 4-log virus inactivation and removal) before or at the first customer must:

i. Monitor the alternative treatment in accordance with all Director-specified monitoring requirements; and

ii. Operate the alternative treatment in accordance with all compliance requirements that the Director determines to be necessary to achieve at least 4-log treatment of viruses.

C. Discontinuing Treatment

A groundwater system may discontinue 4-log treatment of viruses (using inactivation, removal, or a Director-approved combination of 4-log virus inactivation and removal) before or at the first customer for a groundwater source if the Director determines and documents in writing that 4-log treatment of viruses is no longer necessary for that groundwater source. A system that discontinues 4-log treatment of viruses is subject to the source water monitoring and analytical methods requirements of §2503.

D. Failure to meet the monitoring requirements of subsection (B) of this section is a monitoring violation and requires the groundwater system to provide public notification under §605.

§2504 Treatment Technique Violations for Groundwater Systems

A. A groundwater system with a significant deficiency is in violation of the treatment technique requirement if, within 120 days (or earlier if required by the Director) of receiving written notice from the Director of the significant deficiency, the system:

1. Does not complete corrective action in accordance with any applicable PWSSP plan review processes or other guidance and direction, including Director-specified interim actions and measures, or

2. Is not in compliance with a Director-approved corrective action plan and schedule.

B. Unless the Director invalidates a fecal indicator-positive groundwater source sample under §2503(D), a groundwater system is in violation of the treatment technique requirement if, within 120 days (or earlier if required by the Director) of meeting the conditions of §2504(A)(1) or §2504(A)(2), the system:

1. Does not complete corrective action in accordance with any applicable PWSSP plan review processes or other guidance and direction, including Director-specified interim measures, or

2. Is not in compliance with a Director-approved corrective action plan and schedule.

C. A groundwater system subject to the requirements of §2504(B)(3) that fails to maintain at least 4-log treatment of viruses (using inactivation, removal, or a Director-approved combination of 4-log virus inactivation and removal) before or at the first customer for a groundwater source is in violation of the treatment technique requirement if the failure is not corrected within four hours of determining the system is not maintaining at least 4-log treatment of viruses before or at the first customer.

D. Groundwater systems must give public notification under §604 for the treatment technique

violations specified in subsections (A), (B) and (C) of this section.

§2505 Reporting and Recordkeeping for Groundwater Systems

A. Reporting

In addition to the requirements of §502, a groundwater system regulated under this part must provide the following information to the Director:

1. A groundwater system conducting compliance monitoring under §2504(B) must notify the Director any time the system fails to meet any Director-specified requirements including, but not limited to, minimum residual disinfectant concentration, membrane operating criteria or membrane integrity, and alternative treatment operating criteria, if operation in accordance with the criteria or requirements is not restored within four hours. The groundwater system must notify the Director as soon as possible, but in no case later than the end of the next business day.

2. After completing any corrective action under §2504(A), a groundwater system must notify the Director within 30 days of completion of the corrective action.

3. If a groundwater system subject to the requirements of §2503(A) does not conduct source water monitoring under §2503(A)(5)(b), the system must provide documentation to the Director within 30 days of the total coliform positive sample that it met the Director-specified criteria.

B. Recordkeeping

In addition to the requirements of §503, a groundwater system regulated under this part must maintain the following information in its records:

1. Documentation of corrective actions. Documentation shall be kept for a period of not less than 10 years.

2. Documentation of notice to the public as required under §2504(A)(7). Documentation shall be kept for a period of not less than three years.

3. Records of decisions under §2503(A)(5)(b) and records of invalidation of fecal indicator-positive groundwater source samples under §2503(D). Documentation shall be kept for a period of not less than five years.

4. For consecutive systems, documentation of notification to the wholesale system(s) of total-coliform positive samples that are not invalidated under §404 (D). Documentation shall be kept for a period of not less than five years.

5. For systems, including wholesale systems, that are required to perform compliance monitoring under §2504(B):

   a. Records of the Director-specified minimum disinfectant residual. Documentation shall be kept for a period of not less than ten years.

   b. Records of the lowest daily residual disinfectant concentration and records of the date and duration of any failure to maintain the Director-prescribed minimum residual disinfectant concentration for a period of more than four hours. Documentation shall be kept for a period of not less than five years.

   c. Records of Director-specified compliance requirements for membrane filtration and of parameters specified by the Director for Director-approved alternative treatment and records of the date and duration of any failure to meet the membrane operating, membrane integrity, or alternative treatment operating requirements for more than four hours. Documentation shall be kept for a period of not less than five years.

APPENDIX A[1]
SAMPLING AND ANALYTICAL METHODOLOGY

401-A ALTERNATIVE ANALYTICAL TECHNIQUES

With written permission of the Director, concurred in by the Administrator of the EPA, an alternate analytical technique may be employed. An alternate technique shall be accepted if it is substantially equivalent to the prescribed test in both precision and accuracy as it relates to the determination of compliance with any MCL. The use of the alternate analytical technique shall not decrease the frequency of sampling required by these regulations.

402-A MICROBIOLOGICAL SAMPLING AND ANALYTICAL REQUIREMENTS

A. ANALYTICAL METHODOLOGY

1. The standard sample volume required for total coliform analysis, regardless of analytical method used, is 100 ml.

2. Public water systems need only determine the presence or absence of total coliforms; a determination of total coliform density is not required.

3. Public water systems must conduct total coliform analyses in accordance with one of the analytical methods in the following table:

Table 400-A-1 Analytical Methods for Total Coliform

Organism	Methodology[12]	Citation[1]
Total coliforms [2]	Total Coliform Fermentation Technique [3,4,5] Total Coliform Membrane Filter Technique[6] Presence-Absence (P-A) Coliform Test [5,7] ONPG-MUG Test [8] Colisure Test [9] E*Colite® Test[10] m-ColiBlue24® Test[11]	9221 A, B 9222 A, B, C 9221 9223

The procedures shall be done in accordance with the documents listed below. Copies of the documents may be obtained from the sources listed below. Information regarding obtaining these documents can be obtained from the Safe Drinking Water Hotline at 800-426-4791. Documents may be inspected at EPA's Drinking Water Docket, 1200 North Capitol Street, NW, Suite 700, Washington D.C. 20460 (Telephone: 202-260-3027); or at the Office of the Federal Register, 800 North Capitol Street, NW, Suite 700, Washington D.C. 20408.

[1] Methods 9221 A, B,; 9222 A, B, C; 9221 D and 9223 are contained in *Standard Methods for the Examination of Water and Wastewater,* 18th Edition (1992) and 19th Edition (1995) American Public Health Association, 1015 Fifteenth Street NW, Washington D.C. 20005; Either edition may be used.

[2] The time from sample collection to initiation of analysis may not exceed 30 hours. Systems are encouraged but not required to hold samples below 10 °C during transit.

[3] Lactose broth, as commercially available, may be used in lieu of lauryl tryptose broth, if the system conducts at least 25 parallel tests between this medium and lauryl tryptose broth using the water normally tested, and this comparison demonstrates that the false-positive rate for total coliforms, using lactose broth, is less than 10%.

[4] If inverted tubes are used to detect gas production, the media should cover these tubes at least one-half to two-thirds after the sample is added.

[5] No requirements exist to run the completed phase on 10% of all total coliform-positive confirmed tubes.

[6] MI agar also may be used. Preparation and use of MI agar is set forth in the article, "New medium for the simultaneous detection of total coliform and *Escherichia coli* in water" by Brenner, K.P., et. al., 1993, Appl. Environ. Microbiol. 59:3534-3544. Also available from the Office of Water Resource Center (RC-4100), 401 M. Street SW, Washington, DC 20460, EPA/600/J-99/225.

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In addition to all methods specifically referenced in the Appendices A - G, NNEPA incorporates by reference the methods identified by USEPA on its website as approved analytical methods, for the purposes for which those methods are identified, as those methods may be updated from time to time. The USEPA website may be found at: www.epa.gov/safewater.

[7] Six-times formulation strength may be used if the medium is filter-sterilized rather than autoclaved.
[8] The ONPG-MUG Test is sometimes referred to as the Autoanalysis Colilert System.
[9] A description of the Colisure Test, Feb 28, 1994, may be obtained from IDEXX Laboratories, Inc., One IDEXX Drive, Westbrook, Maine 04092. The Colisure Test may be read after an incubation time of 24 hours.
[10] A description of the E*Colite® Test, "Presence/Absence for Coliforms and *E. Coli* in Water," Dec 21, 1997 is available from Charm Sciences, Inc., 36 Franklin Street, Malden, MA 02148-4120.
[11] A description of the m-ColiBlue24® Test, Aug 17, 1999, is available from the Hach Company, 100 Dayton Avenue, Ames, IA 50010.
[12] EPA strongly recommends that laboratories evaluate the false-positive and negative rates for the method(s) they use for monitoring total coliforms. EPA also encourages laboratories to establish false-positive and false-negative rates within their own laboratory and sample matrix (drinking water or source water) with the intent that if the method they choose has an unacceptable false-positive or negative rate, another method can be used. The Agency suggests that laboratories perform these studies on a minimum of 5% of all total coliform-positive samples, except for those methods where verification/confirmation is already required, e.g., the M-Endo and LES Endo Membrane Filter Tests, Standard Total Coliform Fermentation Technique, and Presence-Absence Coliform Test. Methods for establishing false-positive and negative-rates may be based on lactose fermentation, the rapid test for β-galactosidase and cytochrome oxidase, multi-test identification systems, or equivalent confirmation tests. False-positive and false-negative information is often available in published studies and/or from the manufacturer(s).

B. Public water systems must conduct fecal coliform analysis in accordance with the following procedure.

1. When the MTF Technique or Presence-Absence (PA) Coliform Test is used to test for total coliforms, shake the lactose-positive presumptive tube or P-A vigorously and transfer the growth with a sterile 3-mm loop or sterile applicator stick into brilliant green lactose bile broth and EC medium to determine the presence of total and fecal coliforms, respectively.

2. For EPA-approved analytical methods which use a membrane filter, transfer the total coliform-positive culture by one of the following methods:

a. remove the membrane containing the total coliform colonies from the substrate with a sterile forceps and carefully curl and insert the membrane into a tube of EC medium (the laboratory may first remove a small portion of selected colonies for verification), swab the entire membrane filter surface with a sterile cotton swab and transfer the inoculum to EC medium (do not leave the cotton swab in the EC medium), or inoculate individual total coliform-positive colonies into EC Medium. Gently shake the inoculated tubes of EC medium to insure adequate mixing and incubate in a waterbath at 44.5 ± 0.2°C for 24 ± 2 hours. Gas production of any amount in the inner fermentation tube of the EC medium indicates a positive fecal coliform test.

b. The preparation of EC medium is described in the 18th edition (1992) and 19th edition (1995) of *Standard Methods for the Examination of Water and Wastewater*, Method 9221E (paragraph 1a), either edition may be used.

c. Public water systems need only determine the presence or absence of fecal coliforms; a determination of fecal coliform density is not required.

C. Public water systems must conduct analysis of *Escherichia coli* in accordance with one of the following analytical methods:

1. EC medium supplemented with 50 μg/ml of 4-methylumbelliferyl-beta-D-glucuronide (MUG) (final concentration). EC medium is described in as referenced in subsection (B)(2)(b) of this section. MUG may be added to EC medium before autoclaving. EC medium supplemented with 50 μg/ml of MUG is commercially available. At least 10 ml of EC medium supplemented with MUG must be used. The inner inverted fermentation tube may be omitted. The procedure for transferring a total coliform-positive culture to EC medium supplemented with MUG shall be as specified in subsection (B)(2) of this section for transferring a total coliform-positive culture to EC medium. Observe fluorescence with an ultraviolet light (366 nm) in the dark after incubating tube at 44.5 ± 0.2°C for 24 ± 2 hours; or

2. Nutrient agar supplemented with 100 μg/ml 4-methylumbelliferyl-beta-D-glucuronide (MUG) (final concentration). Nutrient Agar is described in Method 9221B (paragraph 3) in *Standard Methods for the Examination of Water and Wastewater,* 18th edition, 1992 and in the 19th edition, 1995; either edition may be used. This test is used to determine if a total coliform-positive sample, as determined by the Membrane Filter technique or any other method in which a membrane filter is used, contains *E. coli*. Transfer the membrane filter containing a total coliform colony(ies) to nutrient agar supplemented with 100μg/ml (final concentration) of MUG. After incubating the agar plate at 35°C for 4 hours, observe the colony(ies) under ultraviolet light (366 nm) in the dark for fluorescence. If fluorescence is visible, *E. coli* are present.

3. Minimal Medium ONPG-MUG (MMO-MUG) Test, as set forth in the article "National Field Evaluation of a Defined Substrate Method for the Simultaneous Detection of Total Coliforms and *Escherichia coli* from Drinking Water: Comparison with Presence-Absence Techniques" (Edberg et al.), Applied and Environmental Microbiology, Volume 55, pp. 1003-1008, April 1989. (Note: The Autoanalysis Colilert System is an MMO-MUG test). If the MMO-MUG test is total coliform-positive after a 24-hour incubation, test the medium for fluorescence with a 366 nm ultraviolet light (preferably with a 6 watt lamp) in the dark. If fluorescence is observed, the sample is *E. coli*-positive. If fluorescence is questionable (cannot be definitively read) after 24 hours incubation, incubate the culture for an additional four hours (but not to exceed 28 hours total), and again test the medium for fluorescence. The MMO-MUG Test with hepes buffer in lieu of phosphate buffer is the only approved formulation for the detection of *E. coli*.

4. The Colisure Test. A description of the Colisure Test may be obtained from the Millipore Coporation, Technical Services Department, 80 Ashby Road, Bedford MA, 01730.

5. The membrane filter method with MI agar.

6. E*Colite® Test, a description of which is cited in footnote 10 to Table 400-A-1 in subsection (A)(3) of this section.

7. m-ColiBlue24® Test, a description of which is cited in footnote 11 to Table 400-A-1 in subsection (A)(3) of this section.

D. As an option to subsection(C)(iii) of this section, a system with a total coliform-positive, MUG-negative, MMO-MUG test may further analyze the culture for the presence of *E. coli* by transferring a 0.1 ml, 28-hour MMO-MUG culture to EC Medium + MUG with a pipet. The formulation and incubation conditions of EC Medium + MUG, and observation of the results are described in subsection (C)(1) of this section.

E. The following materials are incorporated by reference in this section with the approval of the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Copies of the analytical methods cited in *Standard Methods for the Examination of Water and Wastewater* (18th and 19th editions) may be obtained from the American Public Health Association *et al*,; 1015 Fifteenth Street, NW.; Washington, DC 20005. Copies of the methods set forth in *Microbiological Methods for Monitoring the Environment, Water and Wastes* may be obtained from ORD Publications, U.S. EPA, 26 W. Martin Luther King Drive, Cincinnati, Ohio 45268. Copies of the MMO-MUG Test as set forth in the article "National Field Evaluation of a Defined Substrate Method for the Simultaneous Enumeration of Total Coliforms and *Escherichia coli* from Drinking Water: Comparison with the Standard Multiple Tube Fermentation Method" (Edberg *et al.*) may be obtained from the American Water Works Association Research Foundation, 6666 West Quincy Avenue, Denver, CO 80235. A description of the Colisure Test may be obtained from the Millipore Corp., Technical Services Department, 80 Ashby Road, Bedford, MA 01730. Copies may be inspected at EPA's Drinking Water Docket; 401 M Street, SW.; Washington, DC 20460, or at the Office of the Federal Register; 800 North Capitol Street, NW.; Suite 700; Washington, DC 20408.

403-A INORGANIC CHEMICAL SAMPLING AND ANALYTICAL REQUIREMENTS

TABLE 400-A-2 DETECTION LIMITS FOR INORGANIC CHEMICALS

CONTAMINANT	MCL (mg/l)	METHODOLOGY	DETECTION LIMIT (mg/l)
ANTIMONY	0.006	Atomic Absorption: Furnace Atomic Absorption: Platform	0.003 0.0008[5]

		ICP-Mass Spectrometry Hydride-Atomic Absorption	0.0004 0.001
ARSENIC	[6] 0.010	Atomic Absorption; Furnace Atomic Absorption; Platform--Stabilized Temperature. Atomic Absorption; Gaseous Hydride ICP-Mass Spectrometry	0.001 [7] 0.0005 0.001 [8] 0.0014
ASBESTOS	7 MFL[1]	Transmission Electron Microscopy	0.01 MFL
BARIUM	2	Atomic Absorption: furnace technique Atomic Absorption: direct aspiration Inductively Coupled Plasma	0.002 0.1 0.002 (0.001)
BERYLLIUM	0.004	Atomic Absorption: Furnace Atomic Absorption: Platform Inductively Coupled Plasma[2] ICP-Mass Spectrometry.	0.0002 0.00002[5] 0.0003 0.0003
CADMIUM	0.005	Atomic Absorption: furnace technique Inductively Coupled Plasma	0.0001 0.001
CHROMIUM	0.1	Atomic Absorption: furnace technique Inductively Coupled Plasma	0.001 0.007 (0.001)
CYANIDE	0.2	Distillation, Spectrophotometric[3] Distillation: Automated, Spectrophotometric[3] Distillation, Selective Electrode[3] Distillation, Amenable, Spectrophotometric[4]	0.02 0.005 0.05 0.02
MERCURY	0.002	Manual Cold Vapor Technique Automated Cold Vapor Technique	0.0002 0.0002
NICKEL	x1	Atomic Absorption: Furnace Atomic Absorption: Platform Inductively Coupled Plasma[2] ICP-Mass Spectrometry	0.001 0.0006[5] 0.005 0.0005
NITRATE	10 (as N)	Manual Cadmium Reduction Automated Hydrazine Reduction Automated Cadmium Reduction Ion Selective Electrode Ion Chromatography	0.01 0.01 0.05 1 0.01
NITRITE	1 (as N)	Spectrophotometric Automated Cadmium Reduction Manual Cadmium Reduction Ion Chromatography	0.01 0.05 0.01 0.004
SELENIUM	0.05	Atomic Absorption: furnace Atomic Absorption: gaseous hydride	0.002 0.002

THALLIUM	0.002	Atomic Absorption: Furnace Atomic Absorption: Platform ICP-Mass Spectrometry.	0.001 0.0007[5] 0.0003

[1] MFL = million fibers per liter > 10 micrometers
[2] Using a 2X preconcentration step as noted in Method 200.7. Lower MDLs may be achieved when using a 4X preconcentration.
[3] Screening method for total cyanides.
[4] Measures "free" cyanides.
[5] Lower MDLs are reported using stabilized temperature graphite furnace atomic absorption.
[6]The value for arsenic is effective January 23, 2006. Until then, the MCL is 0.05 mg/L.
[7] The MDL reported for EPA Method 200.9 (Atomic Absorption; Platform - Stabilized Temperature) was determined using a 2x concentration step during sample digestion. The MDL determined for samples analyzed using direct analyses (i.e. no sample digestion) will be higher. Using multiple depositions, EPA 200.9 is capable of obtaining MDL of 0.0001 mg/L.
[8] Using selective ion monitoring, EPA method 200.8 (ICP-MS) is capable of obtaining a MDL of 0.0001 mg/L.

A. Inorganic Analysis:

1. Analysis for the following contaminants shall be conducted in accordance with the methods in the Table 400-A-3, or their equivalent as determined by EPA. Criteria for analyzing arsenic, barium, beryllium, cadmium, calcium, chromium, copper, lead, selenium, sodium, and thallium with digestion or directly without digestion, and other analytical test procedures are contained in *Technical Notes on Drinking Water Methods*, EPA-600/R-94-173, October 1994. This document also contains approved analytical test methods which remain available for compliance monitoring until July, 1996. These methods will not be available for use after July 1, 1996. This document is available from the National Technical Information Service, NTIS PB95-104766, U.S. Department of Commerce, 5285 Port Royal Road, Springfield, Virginia 22161 (1-800-553-6847).

TABLE 400-A-3 INORGANIC CONTAMINANTS ANALYTICAL METHODS

CONTAMINANT	METHODOLOGY	EPA	ASTM[3]	SM[4]	OTHER
Antimony	Atomic Absorption; Furnace			3113 B	
	Atomic Absorption; Platform	[2]200.9			
	ICP-Mass Spectrometry	[2]200.8			
	Hydride-Atomic Absorption		D-3697-92		
Arsenic	Inductively Coupled Plasma	[2]200.7		[15]3120 B	
	ICP-Mass Spectrometry	[2]200.8			
	Atomic Absorption; Platform	[2]200.9			
	Atomic Absorption; Furnace		D-2972-97,03 C	3113 B	
	Hydride Atomic Absorption		D-2972-97,03 B	3114 B	
Asbestos	Transmission Electron Microscopy	[9]100.1			
	Transmission Electron Microscopy	[10]100.2			
Barium	Inductively coupled plasma	[2]200.7		3120 B	
	ICP Mass Spectrometry	[2]200.8			
	Atomic Absorption; Direct			3111 D	
	Atomic Absorption; Furnace			3113 B	
Beryllium	Atomic Absorption; furnace		D-3645-93B	3113 B	
	Atomic Absorption; platform	[2]200.9			
	Inductively Coupled Plasma	[2]200.7		3120 B	
	ICP-Mass Spectrometry	[2]200.8			
Cadmium	Inductively Coupled plasma	[2]200.7			
	ICP Mass Spectrometry	[2]200.8			
	Atomic Absorption; Platform	[2]200.9			
	Atomic Absorption; Furnace			3113 B	
Chromium	Inductively Coupled Plasma	[2]200.7		3120 B	
	ICP-Mass Spectrometry	[2]200.8			
	Atomic Absorption; Platform	[2]200.9			
	Atomic absorption; Furnace			3113 B	
Cyanide	Manual Distillation followed by		D2036-98A	4500-CN-C	

	Spectrophotometric, Amenable		D-2036-98B	4500-CN-G	
	Spectrophotometric Manual		D-2036-98A	4500-CN-E	I-3300-85[5]
	Spectrophotometric Semi-Automated	[6]335.4			
	Selective Electrode			4500-CN-F	
Fluoride	Ion Chromatography	[6]300.0	D4327-91	4110B	
	Manual Distill; color. SPADNS			4500F-B,D	
	Manual Electrode		D1179-93B	4500F-C	
	Automated Electrode				380-75WE [11]
	Automated Alizarin			4500F-E	129-71W [11]
	Capillary Ion Electrophoresis				D6508, Rev.2[23]
Mercury	Manual cold vapor	[2]245.1	D3223-97,02	3112 B	
	Automated cold vapor	[1]245.2			
	ICP-Mass Spectrometry	[2]200.8			
Nickel	Inductively Coupled Plasma	[2]200.7		3120B	
	ICP-Mass Spectrometry	[2]200.8			
	Atomic Absorption; Platform	[2]200.9			
	Atomic Absorption; Direct			3111B	
	Atomic Absorption; Furnace			3113B	
Nitrate	Ion chromatography	[6]300.0	D4327-97, 03	4110B	B-1011 [8]
	Automated cadmium reduction	[6]353.2	D3867-90A	4500-NO_3-F	
	Ion selective electrode			4500-NO_3-D	601[7]
	Manual cadmium reduction		D3867-90B	4500-NO_3-E	
	Capillary Ion Electrophoresis				D6508, Rev.2[23]
Nitrite	Ion chromatography	[6]300.0	D4327-97, 03	4110B	B-1011[8]
	Automated cadmium reduction	[6]353.2	D3867-90A	4500-NO_3-F	
	Manual cadmium reduction		D3867-90B	4500-NO_3-E	
	Spectrophotometric			4500-NO_2-B	
	Capillary Ion Electrophoresis				D6508, Rev.2[23]
Selenium	Hydride-Atomic Absorption		D3859-93A	3114B	
	ICP Mass Spectrometry	[2]200.8			
	Atomic Absorption; Platform	[2]200.9			
	Atomic absorption; Furnace		D3859-98B, 03	3113B	
Thallium	Atomic Absorption; Platform	[2]200.9			
	ICP-Mass Spectrometry	[2]200.8			
Lead	Atomic Absorption; furnace		D3559-95D	3113B	
	ICP Mass Spectrometry	[2]200.8			
	Atomic Absorption; platform	[2]200.9			
	Differential Pulse Anodic Stripping Voltametry				Method 1001[15]
Copper	Atomic absorption; furnace		D1688-95C	3113B	
	Atomic absorption; direct aspiration		D1688-95A	3111B	
	ICP	[2]200.7		3120B	
	ICP-Mass Spectrometry	[2]200.8			
	Atomic absorption; platform	[2]200.9			
Conductivity	Conductance		D1125-95A	2510B	
Alkalinity	Tritrimetric		D1067-92B	2320B	
	Electrometric titration				I-1030-85 [5]
Calcium	EDTA titrimetric		D511-93 A	3500-Ca-D	
	Atomic Absorption; direct aspiration		D511-93 B	3111B	
	Inductively-coupled plasma	[2]200.7		3120B	
	Ion Chromatography		D6919-03		
Magnesium	Atomic Absorption		D 511-93, 03B	3111 B	
	ICP	[2]200.7		3120 B	
	Complexation Titrimetric Methods		D 511-93, 03A	3500-Mg E	
	Ion Chromatography		D6919-03		
Orthophosphate [12]	Colorimetric, automated, ascorbic acid	[6]365.1		4500-P F	
	Colorimetric, ascorbic acid, single reagent		D515-88A	4500-P E	

	Colorimetric, phosphomolybdate				I-1602-85[5]
	automated-segmented flow;				I-2601-90[5]
	automated discrete				I-2598-85[5]
	Ion chromatography	[6]300.0	D4327-97, 03	4110 B	
	Capillary Ion Electrophoresis				D6508, Rev.2[23]
pH	Electrometric	[1]150.1 [1]150.2	D1293-95	4500-H+-B	
Silica	Colorimetric, molybdate blue;				I-1700-85[5]
	automated-segmented flow				I-2700-85[5]
	Colorimetric		D859-94, 00		
	Molybdosilicate			4500-Si-D	
	Heteropoly blue			4500-Si-E	
	Automated method for molybdate-reactive silica			4500-Si-F	
	Inductively-couple plasma	[3]200.7		3120B	
Sodium	Inductively-coupled plasma	[2]200.7			
	Atomic Absorption; direct aspiration			3111B	
	Ion chromatography		D6919-03		
Temperature	Thermometric			2500B	

The procedures shall be done in accordance with the documents listed below. Copies of the documents may be obtained from the sources listed below. Information regarding obtaining these documents can be obtained from the Safe Drinking Water Hotline 800-426-4791. Documents may be inspected at EPA's Drinking Water Docket, EPA West, 1301 Constitution Avenue, NW, Room B135, Washington, D.C. (Telephone: 202-566-2426).; or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, Call 202-741-6030, or go to: http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html.

[1] "Method for Chemical Analysis of Water and Wastes" , EPA-600/4-79-020, March 1983. Available at NTIS, PB84-128677.

[2] "Methods for the Determination of Metals in Environmental Samples-Supplement I", EPA-600/R-94-111, May 1994. Available at NTIS, PB 95-125472.

[3] Annual Book of ASTM Standards, 1994, 1996, 1999 or 2003, Vols. 11.01 and 11.02, ASTM International; any year containing the cited version of the method may be used. The previous versions of D1688-95A, D1688-95C (copper), D3559-95D (lead), D1293-95 (pH), D1125-91A (conductivity) and D859-94 (silica) are also approved. These previous versions D1688-90A, C; D3559-90D, D1293-84, D1125-91A and D859-88, respectively are located in the Annual Book of ASTM Standards, 1994, Vol. 11.01. Copies may be obtained from the ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428.

[4] Standard Methods for the Examination of Water and Wastewater, 18th edition (1992), 19th edition (1995), or 20th edition (1998). American Public Health Association 1015 Fifteenth Street NW., Washington, DC 20005. The cited methods published in any of these three editions may be used, except that the versions of 3111B, 3111D, 3113B and 3114B in the 20th edition may not be used.

[5] Method I-2601-90, Methods for Analysis by the U.S. Geological Survey National Water Quality Laboratory - Determination of Inorganic and Organic Constituents in Water and Fluvial Sediments, Open File Report 93-125, 1993; For Methods I-1030-85; I-1601-85: I-1700-85; I-2598-85; I-2700-85; and I-3300-85 see Techniques of Water Resources Investigation of the U.S. Geological Survey, Book 5 Chapter A-1, 3rd ed., 1989; Available from Information Services, U.S. Geological Survey, Federal Center, Box 25286, Denver,CO 80225-0425.

[6] "Methods for the Determination of Inorganic Substances in Environmental Samples", EPA 600/R-93-100, August 1993, Available at NTIS, PB94-120821.

[7] The procedure shall be done in accordance with the Technical Bulletin 601 "Standard Method of Test for Nitrate in Drinking Water", July, 1994, PN 221890-001, Analytical Technology, Inc. Copies may be obtained from ATI Orion, 529 Main Street, Boston, MA 02129.

[8] Method B-1011, "Waters Test Method for Determination of Nitrite/Nitrate in Water Using Single Column Ion Chromatography " August 1987. Copies may be obtained from Waters Corporation, Technical Services Division, 34 Maple Street, Milford, MA 01757, Telephone 508/482-2131, Fax 508/482-3625.

[9] Method 100.1 "Analytical Method for Determination of Asbestos Fibers in Water", EPA-600/4-83/043, September 1983, Available at NTIS, PB83-260471.

[10] Method 100.2, "Determination of Asbestos Structure Over 10-μm in Length in Drinking Water", EPA-600/R-94-134, June 1994, Available at NTIS, PB94-201902.

[11] Industrial Method No. 129-71W, "Fluoride in Water and Wastewater", December 1972 and Method No. 380-75WE, "Fluoride in Water and Wastewater", February 1976, Technicon Industrial Systems. Copies may be obtained from Bran & Leubbe, 1025 Busch Parkway, Buffalo Grove, IL 60089.

[12] Unfiltered, no digestion or hydrolysis.

[13] Because MDLs reported in EPA Methods 200.7 and 200.9 were determined using a 2X preconcentration step

during sample digestion, MDLs determined when samples are analyzed by direct analysis (i.e., no sample digestion) will be higher. For direct analysis of cadmium and arsenic by Method 200.7, and arsenic by Method 3120 B sample preconcentration using pneumatic nebulization may be required to achieve lower detection limits. Preconcentration may also be required for direct analysis of antimony, lead, and thallium by Method 200.9; antimony and lead by Method 3113 B; and lead by Method D3559-90D unless multiple in-furnace depositions are made.

[14] If ultrasonic nebulization is used in the determination of arsenic by Methods 200.7, 200.8, or SM 3120 B, the arsenic must be in the pentavalent state to provide uniform signal response. For methods 200.7 and 3120 B, both samples and standards must be diluted in the same mixed acid matrix concentration of nitric and hydrochloric acid with the addition of 100 µL of 30% hydrogen peroxide per 100ml of solution. For direct analysis of arsenic with method 200.8 using ultrasonic nebulization, samples and standards must contain one mg/L of sodium hypochlorite.

[15]Starting January 23, 2006, analytical methods using the ICP-AES technology, may not be used because the detection limits for these methods are 0.008 mg/L or higher. This restriction means that the two ICP-AES methods (EPA Method 200.7 and SM3120 B) approved for use for the MCL of 0.05 mg/L may not be used for compliance determinations for the revised MCL of 0.010 mg/L. However, prior to January 23, 2006, systems may have compliance samples analyzed with these less sensitive methods.

[16]The description for Method Number 1001 for lead is available from Palintest, LTD, 21 Kenton Lands Road, P.O. Box 18395, Erlanger, KY 41018 or from the Hach Company, P.O. Box 389, Loveland, CO 80539.

[17]the description for the Kelada 01 Method, "Kelada Automated Test Methods for Total Cyanide, Acid Dissociable Cyanide, and Thiocyanate", Revision 1.2, August 2001, EPA #821-B-01-009 for cyanide is available from the National Technical Information Service (NTIS), PB 2001-108275, 5282 Port Royal Road, Springfield, VA 22161. The toll free telephone number is 800-553-6847. **Note:** A 450-W UB lamp may be used in this method instead of the 550-W lamp specified if it provides performance within the quality control (QC) acceptance criteria of the method in a given instrument. Similarly, modified flow cell configurations and flow conditions may be used in the method, provided that the QC acceptance criteria are met.

[18]The description for the QuikChem Method 10-204-001-X, "Digestion and distillation of total cyanide in drinking and wastewaters using MICRO DIST and determination of cyanide by flow injection analysis," Revision 2.1, November 30, 2000 for cyanide is available from Lachat Instruments, 6645 W. Mill Rd, Milwaukee, WI 53218, USA. Phone 414-358-4200.

[19] "Methods for the Determination of Organic and Inorganic Compounds in Drinking Water," Vol. 1, EPA 815-R-00-014, August 2000. Available at NTIS, PB2000-106981.

[20] Method OIA-1677, DW "Available Cyanide by Flow Injection, Ligand Exchange, and Amperometry," January 2004. EPA-821-R-04-001, Available from ALPKEM, A Divivion of OI Analytical, P.O. Box 9010, College Station, TX 77842-9010.

[21] Sulfide levels below those detected using lead acetate paper may produce positive method interferences. Test samples using a more sensitive sulfide method to determine if a sulfide interference is present, and treat samples accordingly.

23 Method D6508, Rev. 2, "Test Method for Determination of Dissolved Inorganic Anions in Aqueous Matrices Using Capillary ion Electrophoresis and Chromate Electrolyte," Available from Waters Corp, 34 Maple St. Milford, MA, 07157, Telephone: 508/482-2131, Fax: 508/482-3625.

B. Sample collection for antimony, arsenic, asbestos, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, nickel, nitrate, nitrite, selenium and thallium under this section shall be conducted using the sample preservation, container, and maximum holding time procedures specified in the table below:

TABLE 400-A-4 SAMPLE COLLECTION PROCEDURE

CONTAMINANT	PRESERVATIVE[1]	CONTAINER[2]	TIME[3]
Antimony	HNO_3	P or G	6 months
Arsenic	Conc HNO_3 to pH < 2	P or G	6 months
Asbestos	4°C	P or G	48 hours[4]
Barium	HNO_3	P or G	6 months
Beryllium	HNO_3	P or G	6 months
Cadmium	HNO_3	P or G	6 months
Chromium	HNO_3	P or G	6 months

Cyanide	4°C, NaOH	P or G	14 days
Fluoride	NONE	P or G	1 month
Mercury	HNO_3	P or G	28 days
Nickel	HNO_3	P or G	6 months
Nitrate	4°C	P or G	48 hours[5]
Nitrate-Nitrite[6]	H_2SO_4	P or G	28 days
Nitrite	4°C	P or G	48 hours
Selenium	HNO_3	P or G	6 months
Thallium	HNO_3	P or G	6 months

[1] For cyanide determinations samples must be adjusted with sodium hydroxide to pH 12 at the time off collection. When chilling is indicated the sample must be shipped and stored at 4 deg. C or less. Acidification of nitrate or metals samples may be with a concentrated acid or a dilute (50% by volume) solution of the applicable concentrated acid. Acidification of samples for metals analysis is encouraged and allowed at the laboratory rather than at the time of sampling provided the shipping time and other instructions in Section 8.3 of EPA Methods 200.7 or 200.8 or 200.9 are followed.
[2] P = plastic, hard or soft; G=glass, hard or soft.
[3] In all cases, samples should be analyzed as soon after collection as possible. Follow additional (if any) information on preservation, containers, or holding times that is specified in method.
[4] Instruction for containers, preservation procedures and holding times as specified in Method 100.2 must be adhered to for all compliance analyses including those conducted with Method 100.1.
[5] If the sample is chlorinated, the holding time for an un-acidified sample kept at 4°C is extended to 14 days.
[6] Nitrate-Nitrite refers to a measurement of total nitrate.

C. Analysis under this section shall only be conducted by laboratories that have been certified by EPA. Laboratories may conduct sample analysis under provisional certification until January 1, 1996. To receive certification to conduct analyses for antimony, arsenic, asbestos, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, nickel, nitrate, nitrite, selenium and thallium, the laboratory must:

1. Analyze Performance Evaluation (PE) provided by EPA, at least once a year.
2. For each contaminant that has been included in the PE sample and for each method for which the laboratory desires certification achieve quantitative results on the analyses that are within the following acceptance limits:

TABLE 400-A-5 CONTAMINANT ACCEPTANCE LIMIT

CONTAMINANT	ACCEPTANCE LIMIT
Antimony	± 30 at ≥ 0.006 mg/l
Arsenic	± 30 at ≥ 0.003 mg/L
Asbestos	2 standard deviations based on study statistics
Barium	± 15% at ≥ 0.15 mg/l
Beryllium	± 15% at ≥ 0.001 mg/l
Cadmium	± 20% at ≥ 0.002 mg/l
Chromium	± 15% at ≥ 0.01 mg/l
Cyanide	± 25% at ≥ 0.1 mg/l
Fluoride	± 10% at ≥1 to 10 mg/l

Mercury	± 30% at ≥ 0.0005 mg/l
Nitrate	± 10% at ≥ 0.4 mg/l
Nitrite	± 15% at ≥ 0.4 mg/l
Selenium	± 20% at ≥ 0.01 mg/l
Thallium	± 30% at ≥ 0.002 mg/l

404-A ORGANIC CHEMICALS SAMPLING AND ANALYTICAL REQUIREMENTS

A. Analyses for the contaminants listed in § 204, Table 200.3 (1) through (21), shall be conducted using the following EPA methods or their equivalent as approved by EPA.

1. The following documents are incorporated by reference. Copies may be inspected at EPA's Drinking Water Docket, 401 M Street, SW., Washington, DC 20460; at the Office of the Federal Register, 800 North Capitol Street, NW., Suite 700, Washington, DC. Method 508A and 515.1 are in *Methods for the Determination of Organic Compounds in Drinking Water*, EPA-600/R-88-039, December 1988, revised July 1991. Methods 547, 550 and 550.1 are in *Methods for the Determination of Organic Compounds in Drinking Water-Supplement I*, EPA-600-4-90-020, July 1990. Methods 548.1, 549.1, 552.1 and 555 are in Methods for the Determination of Organic Compounds in Drinking Water-Supplement II, EPA-600/R-92-129, August 1992. Methods 502.2, 504.1, 505, 506, 507, 508, 508.1, 515.2, 524.2, 525.2, 531.1, 551.1, and 552.2 are in *Methods for the Determination of Organic Compounds in Drinking Water-Supplement III*, EPA/600/R-95-131, August 1995. Method 1613 is titled "Tetra-through Octa-Chlorinated Dioxins and Furans by Isotope-Dilution HRGC/HRMS", EPA -821-B-94-005, October 1994. These documents are available from the NTIS PB91-231480, PB91-146027, PB92-207703, PB95-261616 and PB95-104774, US Department of Commerce, 5285 Port Royal Road, Springfield, VA 22161 (1-800-553-6847). Method 6651 shall be followed in accordance with *Standard Methods for the Examination of Water and Wastewater*, 18th edition, 1992 and 19th edition, 1995, American Public Health Association (APHA); either edition may be used. Method 6610 shall be followed in accordance with the *Supplement to the 18th edition of Standard Methods for the Examination of Water and Wastewater,* 1994, or with the19th edition of *Standard Methods for the Examination of Water and Wastewater,* 1995, APHA; either publication may be used. The APHA documents are available from APHA 1015, Fifteenth Street NW., Washington, D.C. 20005. Other required analytical test procedures germane to the conduct of these analyses are contained in *Technical Notes on Drinking Water Methods,* EPA 600/R-94-173, October 1994, NTIS PB95-104766. EPA Methods 515.3 and 549.2 are available from U.S. Environmental Protection Agency, National Exposure Research Laboratory (NERL)-Cincinnati, 26 West Martin Luther King Drive, Cincinnati, OH 45268. ASTM Method D 5317-93 is available in the *Annual Book of ASTM Standards*, 1996, Vol. 11.02, American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428, or in any edition published after 1993.

TABLE: 400-A-6 ORGANIC CHEMICALS OTHER THAN TOTAL TRIHALOMETHANES SAMPLING AND ANALYTICAL METHODS

Contaminant	Method
Benzene	502.2, 524.2
Carbon Tetrachloride	502.2, 524.2, 551
Chlorobenzene	502.2, 524.2
1,2-Dichlorobenzene	502.2, 524.2
1,4-Dichlorobenzene	502.2, 524.2
1,2-Dichloroethane	502.2, 524.2
cis-Dichloroethylene	502.2, 524.2

trans-Dichloroethylene	502.2, 524.2
1,2-Dichloropropane	502.2, 524.2
Ethylbenzene	502.2, 524.2
Styrene	502.2, 524.2
Tetrachloroethylene	502.2, 524.2, 551.1
1,1,1-Trichloroethane	502.2, 524.2, 551.1
Trichloroethylene	502.2, 524.2, 551.1
Toluene	502.2, 524.2
1,2,4-Trichlorobenzene	502.2, 524.2
1,1-Dichloroethylene	502.2, 524.2
1,1,2-Trichloroethane	502.2, 524.2, 551.1
Vinyl Chloride	502.2, 524.2
Xylenes (total)	502.2, 524.2
2,3,7,8-TCDD (dioxin)	1613
2,4-D[4] (as acids, salts, and esters)	515.2, 555, 515.1, 515.3, D5317-93
2,4,5-TP[4] (Silvex)	515.2, 555, 515.1, 515.3, D5317-93
Alachlor[2]	507, 525.2, 508.1, 505, 551.1
Atrazine[2]	507, 525.2, 508.1, 505, 551.1
Benzo(a)pyrene	525.2, 550, 550.1
Carbofuran	531.1, 6610
Chlordane	508, 525.2, 508.1, 505
Dalapon	552.1, 515.1, 552.2, 515.3
Di(2-ethylhexyl)adipate	506, 525.2
Di(2-ethylhexyl)phthalate	506, 525.2
Dibromochloropropane (DBCP)	504.1, 551.1
Dinoseb[4]	515.2, 555, 515.1, 515.3
Diquat	549.2
Endothall	548.1
Endrin	505, 508, 525.2, 508.1, 551.1
Ethylene dibromide (EDB)	504.1, 551.1
Glyphosate	547, 6651
Heptachlor	505, 508, 525.2, 508.1, 551.1
Heptachlor epoxide	505, 508, 525.2, 508.1, 551.1
Hexachlorobenzene	505, 508, 525.2, 508.1, 551.1

Hexachlorocylopentadiene	505, 508, 525.2, 508.1, 551.1
Lindane	505, 508, 525.2, 508.1, 551.1
Methoxychlor	505, 508, 525.2, 508.1, 551.1
Oxamyl	531.1, 6610
PCBs[3](as decachlorobiphenyl) (as Aroclors)	508A 505, 508, 508.1, 525.2
Pentachlorophenol	515.2, 525.2, 555, 515.1, 515.3, D5317-93
Picloram[4]	515.2, 555, 515.1, 515.3, D5317-93
Simazine[2]	507, 525.2, 508.1, 505, 551.1
Toxaphene	508, 508.1, 525.2, 505
Total Trihalomethanes	502.2, 524.2, 551.1

[1] For previously approved EPA methods which remain available from compliance monitoring until June 1, 2001, see paragraph (e)(2) of this section.
[2] Substitution of the detector specified in Method 505, 507, 508, or 508.1 for the purpose of achieving lower detection limits is allowed as follows. Either an electron capture or nitrogen phosphorous detector may be used provided all regulatory requirements and quality control criteria are met.
[3] PCBs are qualitatively identified as Aroclors and measured for compliance purposes as decachlorobiphenyl. Users of Method 505 may have more difficulty in achieving the required detection limits than users of Methods 508.1, 525.2 or 508.
[4] Accurate determination of the chlorinated esters requires hydrolysis of the sample as described in EPA methods 515.1, 515.2, 515.3, and 555, and ASTM Method D 5317-93.

B. Compositing samples prior to GC analysis.

1. Add 5 ml or equal larger amounts of each sample (up to 5 samples are allowed) to a 25 ml glass syringe. Special precautions must be made to maintain zero head-space in the syringe.

2. The samples must be cooled at 4° Celsius during this step to minimize volatilization losses.

3. Mix well and draw out a 5-ml aliquot for analysis.

4. Follow sample introduction, purging, and desorption steps described in the method.

5. If less than five samples are used for compositing, proportionately small syringe may be used.

C. Compositing samples prior to GC/MS analysis.

1. Inject 5-ml or equal larger amounts of each aqueous sample (up to 5 samples are allowed) into a 25-ml purging device using the sample introduction technique described in the method.

2. The total volume of the sample in the purging device must be 25 ml.

3. Purge and desorb as described in the method.

D. Analysis under this section shall only be conducted by laboratories that are certified by EPA according to the following conditions (laboratories may conduct sample analysis under provisional certification until January 1, 1996):

1. To receive certification to conduct analyses for the contaminants in § 204 (A)(1) Table 200.3 (2) through (21) the laboratory must:

a. Analyze Performance Evaluation (PE) samples provided by EPA at least once a year by each method for which the laboratory desires certification.

b. Achieve the quantitative acceptance limits under subsection (E)(1)(c) and (d) of

this section for at least 80% of the regulated organic chemicals listed in Table 200.3 (2) through (21).

c. Achieve quantitative results on the analyses performed under subsection (E)(1)(a) of this section that are within ±20% of the actual amount of the substances in the Performance Evaluation sample when the actual amount is greater than or equal to 0.010 mg/l.

d. Achieve quantitative results on the analyses performed under subsection (E)(1)(a) of this section that are within ±40% of the actual amount of the substances in the Performance Evaluation sample when the actual amount is less than 0.010 mg/l.

e. Achieve a method detection limit of 0.0005 mg/l, according to the procedures in Appendix B of 40 CFR Part 136.

2. To receive certification for vinyl chloride, the laboratory must:

a. Analyze Performance Evaluation (PE) samples provided by EPA at least once a year by each method for which the laboratory desires certification.

b. Achieve quantitative results on the analyses performed under subsection(E)(2)(a) of this section that are within ±40% of the actual amount of vinyl chloride in the Performance Evaluation sample.

c. Achieve a method detection limit of 0.0005 mg/l, according to the procedures in Appendix B of 40 CFR Part 136.

d. Obtain certification for the contaminants listed in Table 200.3 (2) through (21).

3. Each certified laboratory must determine the method detection limit (MDL), as defined in Appendix B to 40 CFR Part 136, at which it is capable of detecting VOCs. The acceptable MDL is 0.0005 mg/l. This concentration is the detection concentration for purposes of this section.

4. Analysis for PCBs shall be conducted as follows using the methods in subsection A of this section:

a. Each system which samples for PCBs shall analyze each sample using either Method 508.1, 525.2, 508 or 505. Users of method 505 may have more difficulty in achieving the required Aroclor detection limits than users of Methods 508.1, 525.2, or 508.

b. If PCBs (as one of seven Arochlors) are detected (as designated in this subsection) in any sample analyzed using Methods 505 or 508, the system shall reanalyze the sample using Method 508A to quantitate PCBs (as decachlorobipheny1).

TABLE 400-A-7 DETECTION LIMIT OF PCB

AROCHLOR	DETECTION LIMIT mg/l)
1016	0.00008
1221	0.02
1232	0.0005
1242	0.0003
1248	0.0001
1254	0.0001
1260	0.0002

c. Compliance with the PCB MCL shall be determined based upon the quantitative results of analyses using Method 508A.

5. Detection, as used in this subsection, shall be defined as greater than or equal to the following concentrations for each contaminant.

TABLE 400-A-8 DETECTION LIMIT

CONTAMINANT	LIMIT (mg/l)
Alachlor	0.0002
Aldicarb	0.0005
Aldicarb sulfoxide	0.0005
Aldicarb sulfone	0.0008
Atrazine	0.0001
Benzo(a)pyrene	0.00002
Carbofuran	0.0009
Chlordane	0.0002
Dalapon	0.001
Dibromochloropropane (DBCP)	0.00002
Di(2-ethylhexyl) adipate	0.0006
Di(2-ethylhexyl) phthalate	0.0006
Dinoseb	0.0002
Diquat	0.0004
2,4-D	0.0001
Endothall	0.009
Endrin	0.00001
Ethylene dibromide (EDB)	0.00001
Glyphosate	0.006
Heptachlor	0.00004
Heptachlor epoxide	0.00002
Hexachlorobenzene	0.0001
Hexachlorocyclopentadiene	0.0001
Lindane	0.00002
Methoxychlor	0.0001
Oxamyl	0.002
Picloram	0.0001
Polychlorinated biphenyls (PCBs) (as decachlorobipheny1)	0.0001

Pentachlorophenol	0.00004
Simazine	0.00007
Toxaphene	0.001
2,3,7,8-TCDD(Dioxin)	0.000000005
2,4,5-TP (Silvex)	0.0002

6. Analysis under this section shall only be conducted by laboratories that have received certification by EPA and have met the following conditions:

a. To receive certification to conduct analyses for the contaminants in § 204 (A)(2) the laboratory must:

1. Analyze Performance Evaluation (PE) samples provided by EPA at least once a year by each method for which the laboratory desires certification.

2. For each contaminant that has been included in the PE sample achieve quantitative results on the analyses that are within the following acceptance limits:

TABLE 400-A-9 ACCEPTANCE LIMITS

CONTAMINANT	**ACCEPTANCE LIMITS(%)**
Dibromochloropropane (DBCP)	± 40
Ethyldibromide (EDB)	± 40
Alachlor	± 45
Atrazine	± 45
Benzo(a)pyrene	2 Standard deviations
Carbofuran	± 45
Chlordane	± 45
Dalapon	2 Standard deviations
Di(2-ethylhexyl)adipate	2 Standard deviations
Di(2-ethylhexyl)phthalate	2 Standard deviations
Dinoseb	2 Standard deviations
Diquat	2 Standard deviations
Endothall	2 Standard deviations
Endrin	± 30
Glyphosate	2 Standard deviations
Heptachlor	± 45
Heptachlor Epoxide	± 45
Hexachlorobenzene	2 Standard deviations
Hexachloro-cyclopentadiene	2 Standard deviations
Lindane	± 45

Methoxychlor	± 45
Oxamyl	2 Standard deviations
PCBs (as Decachlorobiphenyl)	0-200
Picloram	2 Standard deviations
Simazine	2 Standard deviations
Toxaphene	± 45
Aldicarb	2 Standard deviations
Aldicarb sulfoxide	2 Standard deviations
Aldicarb sulfone	2 Standard deviations
Pentachlorophenol	± 50
2,3,7,8-TCDD (Dioxin)	2 Standard deviations
2,4-D	± 50
2,4-TP (Silvex)	± 50

405-A ANALYTICAL METHODS FOR RADIOACTIVITY

A. Analysis for the following contaminants shall be conducted to determine compliance with §209 (radioactivity) in accordance with the methods in the following table, or their equivalent determined by EPA in accordance with §415.

TABLE 400-A-10 RADIOACTIVITY METHODS

Contaminant	Methodology	Reference (method or page number)								
		EPA[1]	EPA[2]	EPA[3]	EPA[4]	SM[5]	ASTM[6]	USGS[7]	DOE[8]	Other
Naturally occurring: Gross alpha [11] and beta	Evaporation	900.0	p 1	00-01	p 1	302, 7110 B		R-1120-76		
Gross Alpha[11]	Co-precipitation			00-02		7110 C				
Radium 226	Radon emanation	903.1	p 16	Ra-04	p 19	305,7500-Ra C	D 3454-97	R-1141-76	Ra-04	N.Y.[9]
	radio chemical	903.0	p 13	Ra-03		304 7500-Ra B	D 2460-97	R-1140-76		
Radium 228	Radio chemical	904.0	p 24	Ra-05	p 19	7500-Ra D		R-1142-76		N.Y.[9] N.J.[10]
Uranium [12]	Radio Chemical	908.0				7500-U B				
	Fluorometric	908.1				7500-U C(17th Ed)	D2907-97	R-1180-76 R-1181-76	U-04	
	ICP-MS	200.8[13]				3125	D5673-03			

	Alpha spectrometry			00-07	p 33	7500-U C (18th 19th or 20th Ed)	D3972-97	R-1182-76	U-02	
	Laser Phosphorimetry						D5174-97			
Man-made:										
Radioactive cesium	Radio chemical	901.0	p 4			7500-Cs B	D 2459-72	R-1111-76		
	gamma ray spectrometry	901.1			p 92	7120	D 3649-91	R-1110-76	4.5.2.3	
Radioactive iodine	Radio chemical	902.0	p 6 p.9			7500-I B 7500-I C 7500-I D	D 3649-91			
	Gamma ray spectrometry	901.1			p 92	7120	D 4785-93		4.5.2.3	
Radioactive Strontium 89, 90	Radio chemical	905.0	p 29	Sr-04	p 65	303, 7500-Sr B		R-1160-76	Sr-01 Sr-02	
Tritium	Liquid scintillation	906.0	p 34	H-02	p 87	306, 7500-^{3}H B, 306, 7500-^{3}H B-00	D 4107-91	R-1171-76		
Gamma emitters	gamma ray	901.1			p 92	7120	D 3649-91	R-1110-76	Ga-01-R	
	spectrometry	902.0				7500-Cs B, 7500-I B	D4785 93			
		901.0								

The procedures shall be done in accordance with the documents listed below. Copies of the documents may be obtained from the sources listed below. Information regarding obtaining these documents can be obtained from the Safe Drinking Water hotline at 800-426-4791. Documents may be inspected at EPA's Drinking Water Docket, EPA West, 1301 Constitution Avenue, NW, Room B135, Washington, D.C., 20460 (telephone: 202- 566-2426); or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202-741-6030, or go to: *http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html.*

[1]"Prescribed Procedure for Measurement of Radioactivity in Drinking Water", EPA 600/4-80-032, August 1980. Available at U.S. Department of Commerce, National Technical Information Service (NTIS), 5285 Port Royal Road, Springfield, VA 22161 (Telephone 800-553-6847), PB 80-224744, except Method 200.8, "Determination of Trace Elements in Waters and Wastes by Inductively Coupled Plasma-Mass Spectrometry," Revision 5.4, which is published in "Methods for the Determination of Metals in Environmental Samples-Supplement I," EPA 600-R-94-111, May 1994. Available at NTIS, PB95-125472.

[2]"Interim Radiochemical Methodology for Drinking Water", EPA 600/4-75-008 (revised), March 1976, Available at NTIS, ibid. PB 253258.

[3]"Radiochemistry Procedures Manual", EPA 520/8-84-006, December 1987, Available at NTIS ibid, PB 84-215581.

[4]"Radiochemical Analytical Procedures for Analysis of Environmental Samples", March 1979, Available at NTIS, ibid. EMSL LV 053917

[5]"Standard Methods for the Examination of Water and Wastewater", 13th, 17th, 18th, 19th Editions, or 20th edition, 1971, 1989, 1992, 1995, 1998. Available at American Public Health Association, 1015 Fifteenth Street, N.W., Washington, D.C., 20005. Methods 302, 303, 304, 305 and 306 are only in the 13th edition. Methods 711B, 7500-Ra B, 7500-Ra C, 7500-Ra D, 7500-U B, 7500-Cs B, 7500-I B, 7500-I C, 7500-I D, 7500-Sr B, 7500-3H B are in the 17th, 18th, 19th, and 20th editions. Methods 7110 C is in the 18th, 19th and 20th editions. Method 7500-U C Fluorometric Uranium is only in the 17th edition, and 7500-U C Alpha spectrometry is only in the 18th, 19th and 20th editions. Method 7120 is only in the 19th and 20th editions. Methods 302, 303, 304, 305 and 306 are only in the 13th edition. Method 3125 is only in the 20th edition.

[6]Annual Book of ASTM Standards, Vol. 11.01 and 11.02, 1999; ASTM International any year containing the cited version of the method may be used. Copies of these two volumes and the 2003 version of D 5673-03 may be obtained from ASTM International. 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA,

19428-2959.
[7]"Methods for Determination of Radioactive Substances in Water and Fluvial Sediments", Chapter A5 in Book 5 of *Techniques of Water-Resources Investigations of the United States Geological Survey*, 1977. Available at U.S. Geological Survey (USGS) Information Services, Box 25286, Federal Center, Denver CO 80225-0425.
[8]"EML Procedures Manual", 28th (1997) or 27th (1990) Editions, Volumes 1 and 2; either may be used. In the 27th Edition Method Ra-04 is listed as Ra-05 and Method Ga-01-R is listed as Sect. 4.5.2.3. Available at the Environmental Measurements Laboratory, U.S. Department of Energy (DOE), 376 Hudson Street, New York, NY 10014-3621.
[9]"Determination of Ra-226 and Ra-228 (Ra-02)", January 1980, revised June 1982. Available at Radiological Sciences Institute Center for Laboratories and Research, New York State Department of Health, Empire State Plaza, Albany, NY 12201.
[10]"Determination of Radium 228 in Drinking Water", August 1980. Available at State of New Jersey, Department of Environmental Protection, Division of Environmental Quality. Bureau of Radiation and Inorganic Analytical Services, 9 Ewing Street, Trenton, NJ 08625.
[11]Natural uranium and thorium-230 are approved as gross alpha calibration standards for gross alpha with co-precipitation and evaporation methods; americium-241 is approved with co-precipitation methods.
[12]If uranium (U) is determined by mass, a 0.67 pCi/μg of uranium conversion factor must be used. This conversion factor is based on the 1:1 activity of U-234 to U-238 that is characteristic of naturally occurring uranium.
[13]"Determination of Trace Elements in Waters and Wastes by Inductively Coupled Plasma-Mass Spectrometry," Revision 5.4, which is published in "Methods for the Determination of Metals in Environmental Samples-Supplement I," EPA 600-R-94-111, May 1994. Available at NTIS, PB 95-125472.

B. When the identification and measurement of radionuclides other than those listed in subsection (A) of this section is required, the following references are to be used, except in cases where alternative methods have been approved in accordance with § 415.

1. *Procedures for Radiochemical Analysis of Nuclear Reactors Aqueous Solutions*, H.L. Krieger and S. Gold, EPA-R4-73-014, USEPA, Cincinnati, Ohio 45268, May 1973.

2. *HASL Procedures Manual*, Edited by John H. Harley. HASL 300, ERDA Health and Safety Laboratory, New York, NY, 1973.

C. For the purpose of sampling radioactivity concentrations in drinking water, the required sensitivity of the radioanalysis is defined in terms of a detection limit. The detection limit shall be that concentration which can be counted with a precision of ± 100% at the 95% confidence level (1.96 sigma, where sigma is the standard deviation of the net counting rate of the sample).

1. To determine compliance with § 211 (A), the detection limit shall not exceed 1 pCi/l. To determine compliance with § 211 (B), the detection limit shall not exceed 3 pCi/l.

2. To determine compliance with § 211, the detection limits shall not exceed the concentrations listed in Table 400.10.

TABLE 400-A-11 DETECTION LIMITS FOR MAN-MADE BETA PARTICLE AND PHOTON EMITTERS

RADIONUCLIDE	DETECTION LIMIT
Tritium	1,000 pCi/l
Strontium-89	10 pCi/l
Strontium-90	2 pCi/l
Iodine-131	1 pCi/l
Cesium-134	10 pCi/l
Gross Beta	4 pCi/l
Other Radionuclides	1/10 of the applicable limit

406-A TOTAL TRIHALOMETHANES SAMPLING, ANALYTICAL AND OTHER REQUIREMENTS

A. Sampling and analyses made pursuant to this section shall be conducted by the total trihalomethane methods as directed in §207 and in Technical Notes on Drinking Water Methods, EPA-600/R-94-173, October 1994, which is available at NTIS, PB95-104766.

APPENDIX B

PUBLIC NOTIFICATION OF DRINKING WATER VIOLATIONS

601-B NNPDWR Violations and Other Situations Requiring Public Notice

Contaminant	MCL/MRD/TT violations[2]		Monitoring and Testing Procedure Violations	
	Tier of public notice required	Citation	Tier of public notice required	Citation
I. Violations of Navajo Nation Primary Drinking Water Regulations (NNPDWR): [3]				
A. Microbiological Contaminants				
1. Total coliform	2	205(B)(1)	3	404(A)-(E)
2. Fecal coliform/E. coli	1	205(C)(3)	[4]1, 3	404(E)
3. Turbidity MCL	2	206(A)	3	414
4. Turbidity MCL (average of 2 days' samples >5 NTU)	[5]2, 1	206(B)	3	414
5. Turbidity (for TT violations resulting from a single exceedance of maximum allowable turbidity level)	[6]2, 1	803(A)(2), 803(C)(2)(a), 805(A)(2), 805(B)(2), 805(C)(2), 805(D), 1305(A)(2), 1305(B), 2106(B)	3	Appendix D §801-D (A)(1), Appendix D §801-D (B)(2) Appendix D §801-D(C)(1), 1306, 2107 (A)(1)-(3), 2107 (B)
6. Surface Water Treatment Rule violations, other than violations resulting from single exceedance of max. allowable turbidity level (TT).	2	802-805	3	Appendix D
7. Interim Enhanced Surface Water Treatment Rule violations, other than violations resulting from single exceedance of max. turbidity level (TT)	2[7]	[7]1302-1305,2101-2104(A-D)	3	1304, 1306, 2104-2105, 2107
8. Filter Backwash Recycling Rule Violations	2	807	3	807
9. Long Term 1 Enhanced Surface Water Treatment Rule violations	2	2101-2106	3	2104-2105, 2107(A-E)
10. LT2ESWTR violations	2	2409-2419	[22]2,3	2402-2404, Appendix

				G-2401-G - 2402-G, and 2407-2408
11. Ground Water Regulations violations	2	141.404	3	141.402(h). 141.403(d).
B. Inorganic Chemicals (IOCs)				
1. Antimony	2	203(A)	3	405 (A), (B)
2. Arsenic	2	203(A)[17]	3	[18]405 (A), (B)
3. Asbestos (fibers >10 m)	2	203(A)	3	406
4. Barium	2	203(A)	3	405 (A), (B)
5. Beryllium	2	203(A)	3	405 (A), (B)
6. Cadmium	2	203(A)	3	405 (A), (B)
7. Chromium (total)	2	203(A)	3	405 (A), (B)
8. Cyanide	2	203(A)	3	405 (A), (B)
9. Fluoride	2	203(A)	3	405 (A), (B)
10. Mercury (inorganic)	2	203(A)	3	405 (A), (B)
11. Nitrate	1	203(A)	[8]1, 3	407
12. Nitrite	1	203(A)	[8]1, 3	408
13. Total Nitrate and Nitrite	1	203(A)	3	407
14. Selenium	2	204(A)	3	405 (A), (B)
15. Thallium	2	204(A)	3	405 (A), (B)
C. Lead and Copper Rule (Action Level for lead is 0.015 mg/L, for copper is 1.3 mg/L)				
1. Lead and Copper Rule (TT)	2	701-707	3	708-710, Appendix C
D. Synthetic Organic Chemicals (SOCs)				
1. 2,4-D	2	204(A)(2)	3	410, Appendix A (§404-A)
2. 2,4,5-TP (Silvex)	2	204(A)(2)	3	410, Appendix A (§404-A)
3. Alachlor	2	204(A)(2)	3	410, Appendix A (§404-A)
4. Atrazine	2	204(A)(2)	3	410, Appendix A (§404-A)

5. Benzo(a)pyrene (PAHs)	2	204(A)(2)	3	410, Appendix A (§404-A)
6. Carbofuran	2	204(A)(2)	3	410, Appendix A (§404-A)
7. Chlordane	2	204(A)(2)	3	410, Appendix A (§404-A)
8. Dalapon	2	204(A)(2)	3	410, Appendix A (§404-A)
9. Di(2-ethylhexyl) adipate	2	204(A)(2)	3	410, Appendix A (§404-A)
10. Di(2-ethylhexyl) phthalate	2	204(A)(2)	3	410, Appendix A (§404-A)
11. Dibromochloropropane	2	204(A)(2)	3	410, Appendix A (§404-A)
12. Dinoseb	2	204(A)(2)	3	410, Appendix A (§404-A)
13. Dioxin (2,3,7,8-TCDD)	2	204(A)(2)	3	410, Appendix A (§404-A)
14. Diquat	2	204(A)(2)	3	410, Appendix A (§404-A)
15. Endothall	2	204(A)(2)	3	410, Appendix A (§404-A)
16. Endrin	2	204(A)(2)	3	410, Appendix A (§404-A)
17. Ethylene dibromide	2	204(A)(2)	3	410, Appendix A (§404-A)
18. Glyphosate	2	204(A)(2)	3	410, Appendix A (§404-A)
19. Heptachlor	2	204(A)(2)	3	410, Appendix A (§404-A)
20. Heptachlor epoxide	2	204(A)(2)	3	410, Appendix A (§404-A)
21. Hexachlorobenzene	2	204(A)(2)	3	410, Appendix A (§404-A)
22. Hexachlorocyclopentadiene	2	204(A)(2)	3	410, Appendix A (§404-A)
23. Lindane	2	204(A)(2)	3	410, Appendix A (§404-A)
24. Methoxychlor	2	204(A)(2)	3	410, Appendix A (§404-A)
25. Oxamyl (Vydate)	2	204(A)(2)	3	410, Appendix A (§404-A)
26. Pentachlorophenol	2	204(A)(2)	3	410, Appendix A (§404-A)
27. Picloram	2	204(A)(2)	3	410, Appendix A (§404-A)
28. Polychlorinated biphenyls (PCBs)	2	204(A)(2)	3	410, Appendix A (§404-A)
29. Simazine	2	204(A)(2)	3	410, Appendix A (§404-A)
30. Toxaphene	2	204(A)(2)	3	410, Appendix A (§404-A)

E. Volatile Organic Chemicals (VOCs)				
1. Benzene	2	204(A)(1)	3	409, Appendix A (§404-A)
2. Carbon tetrachloride	2	204(A)(1)	3	409, Appendix A (§404-A)
3. Chlorobenzene (monochlorobenzene)	2	204(A)(1)	3	409, Appendix A (§404-A)
4. o-Dichlorobenzene	2	204(A)(1)	3	409, Appendix A (§404-A)
5. p-Dichlorobenzene	2	204(A)(1)	3	409, Appendix A (§404-A)
6. 1,2-Dichloroethane	2	204(A)(1)	3	409, Appendix A (§404-A)
7. 1,1-Dichloroethylene	2	204(A)(1)	3	409, Appendix A (§404-A)
8. cis-1,2-Dichloroethylene	2	204(A)(1)	3	409, Appendix A (§404-A)
9. trans-1,2-Dichloroethylene	2	204(A)(1)	3	409, Appendix A (§404-A)
10. Dichloromethane	2	204(A)(1)	3	409, Appendix A (§404-A)
11. 1,2-Dichloropropane	2	204(A)(1)	3	409, Appendix A (§404-A)
12. Ethylbenzene	2	204(A)(1)	3	409, Appendix A (§404-A)
13. Styrene	2	204(A)(1)	3	409, Appendix A (§404-A)
14. Tetrachloroethylene	2	204(A)(1)	3	409, Appendix A (§404-A)
15. Toluene	2	204(A)(1)	3	409, Appendix A (§404-A)
16. 1,2,4-Trichlorobenzene	2	204(A)(1)	3	409, Appendix A (§404-A)
17. 1,1,1-Trichloroethane	2	204(A)(1)	3	409, Appendix A (§404-A)
18. 1,1,2-Trichloroethane	2	204(A)(1)	3	409, Appendix A (§404-A)
19. Trichloroethylene	2	204(A)(1)	3	409, Appendix A (§404-A)
20. Vinyl chloride	2	204(A)(1)	3	409, Appendix A (§404-A)
21. Xylenes (total)	2	204(A)(1)	3	409, Appendix A (§404-A)
F. Radioactive Contaminants				
1. Beta/photon emitters	2	209(A)(1)	3	Appendix A (§405-A), 412
2. Alpha emitters	2	209(A)(1)	3	Appendix A (§405-A), 411
3. Combined radium (226&228)	2	209(A)(1)	3	Appendix A (§405-A), 411

4. Uranium	2[19]	209(A)(1)	3[20]	Appendix A (§405-A), 411
G. Disinfection Byproducts (DBPs), Byproduct Precursors, Disinfectant Residuals. Where disinfection is used in the treatment of drinking water, disinfectants combine with organic and inorganic matter present in water to form chemicals called disinfection byproducts (DBPs). EPA sets standards for controlling the levels of disinfectants and DBPs in drinking water, including trihalomethanes (THMs) and haloacetic acids (HAAs).[9]				
1. Total trihalomethanes (TTHMs)	2	207(B)[10]	3	1103(a)-(b), 2201-2206, 2301-2310
2. Haloacetic Acids (HAA5)	2	207(B)	3	1103(a)-(b),2201-2206, 2301-2310
3. Bromate	2	207(A)(1)	3	1103(a)-(b)
4. Chlorite	2	207(A)(1)	3	1103(a)-(b)
5. Chlorine (MRDL)	2	208(A)(1)	3	1104(a), (c)
6. Chloramine (MRDL)	2	208(A)(1)	3	1104(a), (c)
7. Chlorine dioxide (MRDL), where any 2 consecutive daily samples at entrance to distribution system only are above MRDL	2	208(A)(1), 141.133(c)(3)	2 [11], 3	1104(a), (c), 1105(c)(2)
8. Chlorine dioxide (MRDL), where sample(s) in distribution system the next day are also above MRDL	[12] 1	208(A)(1), 141.133(c)(3)	1	1104(a), (c), 1105(c)(2)
9. Control of DBP precursors--TOC (TT)	2	1106(a)-(b)	3	1103(a), (d)
10. Bench marking and disinfection profiling	N/A	N/A	3	1304, (reserved)
11. Development of monitoring plan	N/A	N/A	3	1103(f)
H. Other Treatment Techniques				
1. Acrylamide (TT)	2	1002	N/A	N/A
2. Epichlorohydrin (TT)	2	1002	N/A	N/A
II. Public Notification for Variances and Exemptions:				
A. Operation under a variance or exemption	3	[13] 601, 602, 603	N/A	N/A
B. Violation of conditions of a	2	601, 602, 603	N/A	N/A

variance or exemption		[14]142.307		
III. Other Situations Requiring Public Notification:				
A. Fluoride secondary maximum contaminant level (SMCL) exceedance	3	1803	N/A	N/A
B. Exceedance of nitrate MCL for non community systems, as allowed by primacy agency	1	202(C)	N/A	N/A
C. Waterborne disease outbreak	1	104, 803(c)(2)(ii)	N/A	N/A
D. Other waterborne emergency[15]	1	N/A	N/A	N/A
E. Other situations as determined by primacy agency	[21]1, 2, 3	N/A	N/A	N/A
F. Source Water Sample Positive for GWR Fecal indicators: E.coli, enterococci, or coliphage.	1	141.402(g)	N/A	N/A

Appendix B--Endnotes

1. Violations and other situations not listed in this table (e.g., reporting violations and failure to prepare Consumer Confidence Reports), do not require notice, unless otherwise determined by the primary agency. Primacy agencies may, at their option, also require a more stringent public notice tier (e.g., Tier 1 instead of Tier 2 or Tier 2 instead of Tier 3) for specific violations and situations listed in this Appendix, as authorized under § 604(a) and § 605(a).
2. MCL--Maximum contaminant level, MRDL--Maximum residual disinfectant level, TT--Treatment technique.
3. The term Violations of Navajo Nation Primary Drinking Water Regulations (NNPDWR) is used here to include violations of MCL, MRDL, treatment technique, monitoring, and testing procedure requirements.
4. Failure to test for fecal coliform or *E. coli* is a Tier 1 violation if testing is not done after any repeat sample tests positive for coliform. All other total coliform monitoring and testing procedure violations are Tier 3.
5. Systems that violate the turbidity MCL of 5 NTU based on an average of measurements over two consecutive days must consult with the primacy agency within 24 hours after learning of the violation. Based on this consultation, the primacy agency may subsequently decide to elevate the violation to Tier 1. If a system is unable to make contact with the primacy agency in the 24-hour period, the violation is automatically elevated to Tier 1.
6. Systems with treatment technique violations involving a single exceedance of a maximum turbidity limit under the Surface Water Treatment Rule (SWTR), the Interim Enhanced Surface Water Treatment Rule (IESWTR) or Long Term 1 Enhanced Surface Water Treatment (LT1ESWTR) are required to consult with the primacy agency within 24 hours after learning of the violation. Based on this consultation, the primacy agency may subsequently decide to elevate the violation to Tier 1. If a system is unable to make contact with the primacy agency in the 24-hour period, the violation is automatically elevated to Tier 1.
7. Most of the requirements of the Interim Enhanced Surface Water Treatment Rule (63 FR 69477) (§§ 1302-1303, 1305-1306) become effective January 1, 2002 for Part VIII (surface water systems and ground water systems under the direct influence of surface water) serving at least 10,000 persons. However, § 1304 has some requirements that become effective as early as April 16, 1999. The Surface Water Treatment Rule remains in effect for systems serving at least 10,000 persons even after 2002; the Interim Enhanced Surface Water Treatment Rule adds additional requirements and does not in many cases supercede the SWTR.
8. Failure to take a confirmation sample within 24 hours for nitrate or nitrite after an initial sample exceeds the MCL is a Tier 1 violation. Other monitoring violations for nitrate are Tier 3.
9. Part VIII community and non-transient non-community systems serving ≥10,000 must comply with new DBP MCLs, disinfectant MRDLs, and related

monitoring requirements beginning January 1, 2002. All other community and non-transient non-community systems must meet the MCLs and MRDLs beginning January 1, 2004. Part VIII transient non-community systems serving 10,000 or more persons and using chlorine dioxide as a disinfectant or oxidant must comply with the chlorine dioxide MRDL beginning January 1, 2002. Part VIII transient non-community systems serving fewer than 10,000 persons and using only ground water not under the direct influence of surface water and using chlorine dioxide as a disinfectant or oxidant must comply with the chlorine dioxide MRDL beginning January 1, 2004.

10. §§207(B)(1), 1103(A)-(B) apply until §§2301-2310 take effect under the schedule in §2301 (C)

11. Failure to monitor for chlorine dioxide at the entrance to the distribution system the day after exceeding the MRDL at the entrance to the distribution system is a Tier 2 violation.

12. If any daily sample taken at the entrance to the distribution system exceeds the MRDL for chlorine dioxide and one or more samples taken in the distribution system the next day exceed the MRDL, Tier 1 notification is required. Failure to take the required samples in the distribution system after the MRDL is exceeded at the entry point also triggers Tier 1 notification.

13. This citation refers to §§ 601, 602 and 603 of the Navajo Nation Safe Drinking Water Act. §§ 601, 602 and 603 require that "a schedule prescribed . . . for a public water system granted a variance [or exemption] shall require compliance by the system . . ."

14. In addition to §§ 1415 and 1416 of the Safe Drinking Water Act, 40 CFR 142.307 specifies the items and schedule milestones that must be included in a variance for small systems.

15. Other waterborne emergencies require a Tier 1 public notice under § 604(a) for situations that do not meet the definition of a waterborne disease outbreak given in §104 but that still have the potential to have serious adverse effects on health as a result of short-term exposure. These could include outbreaks not related to treatment deficiencies, as well as situations that have the potential to cause outbreaks, such as failures or significant interruption in water treatment processes, natural disasters that disrupt the water supply or distribution system, chemical spills, or unexpected loading of possible pathogens into the source water.

16. Primacy agencies may place other situations in any tier they believe appropriate, based on threat to public health.

17. The arsenic MCL citations are effective January 23, 2006.

18. The arsenic Tier 3 violation MCL citations are effective January 23, 2006.

19. The uranium MCL Tier 2 violation citations are effective December 8, 2003 for all community water systems.

20. The uranium Tier 3 violation citations are effective December 8, 2003 for all community water systems.

21. Primacy agencies may place other situations in any tier they believe appropriate based on threat to public health.

22. Failure to collect three or more samples for Cryptosporidium analysis is a Tier 2 violation requiring special notice as specified in §612. All other monitoring and testing procedure violations are Tier 3.

602-B Standard Health Effects Language for Public Notification

Contaminant	MCLG[1] mg/L	MCL[2] mg/L	Standard Health Effects Language for Public Notification
A. Microbiological Contaminants:			
1a. Total Coliform	Zero	See footnote 3	Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other, potentially-harmful, bacteria may be present. Coliforms were found in more samples than allowed and this was a warning of potential problems.
1b. Fecal coliform/E. coli	Zero	Zero	Fecal coliforms and E. coli are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely compromised immune systems.
1c. Fecal Indicators (GWR) i. E. coli ii. enterococci iii.coliphage	 Zero None None	 TT TT TT	Fecal indicators are microbes whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term health effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely compromised immune systems.
1d. Ground Water Regulations (GWR) TT violations	None	TT	Inadequately treated or inadequately protected water may contain disease-causing organisms. These organisms can cause symptoms such as diarrhea, nausea, cramps, and associated headaches.
2a. Turbidity (MCL)[4]	None	1 NTU[5]/5 NTU	Turbidity has no health effects. However, turbidity can interfere with disinfection and provide a medium for microbial growth. Turbidity may indicate the presence of disease-causing organisms. These organisms include bacteria, viruses, and parasites that can cause symptoms such as nausea, cramps, diarrhea and associated headaches.
2b. Turbidity (SWTR TT)[6]	None	TT[7]	Turbidity has no health effects. However, turbidity can interfere with disinfection and provide a medium for microbial growth. Turbidity may indicate the presence of disease-causing organisms. These organisms include bacteria, viruses, and parasites that can cause symptoms such as nausea, cramps, diarrhea and associated headaches.
2c. Turbidity (IESWTR TT and LT1ESWTR TT[8]	None	TT	Turbidity has no health effects. However, turbidity can interfere with disinfection and provide a medium for microbial growth. Turbidity may indicate the presence of disease-causing organisms. These organisms include bacteria, viruses, and parasites that can cause symptoms such as nausea, cramps, diarrhea and associated headaches.
B. Surface Water Treatment Rule (SWTR) and Interim Enhanced Surface Water Treatment Rule (IESWTR) and Long Term 1 Enhanced Surface Water Treatment Rule (LT1ESWTR) and the Filter Backwash Recycling Rule (FBRR) violations:			
3. Giardia lamblia (SWTR/ IESWTR/ LT1ESWTR).	Zero	TT [10]	Inadequately treated water may contain disease-causing organisms. These organisms include bacteria, viruses, and parasites which can cause symptoms such as nausea, cramps,

4. Viruses (SWTR/IESWTR/LT1ESWTR). 5. Heterotrophic plate count (HPC) bacteria [9] (SWTR/IESWTR/LT1ESWTR). 6. Legionella (SWTR/IESWTR/LT1ESWTR). 7. Cryptosporidium (IESWTR/FBRR/LT1ESWTR).			diarrhea, and associated headaches.
C. Inorganic Chemicals (IOCs)			
8. Antimony	0.006	0.006	Some people who drink water containing antimony well in excess of the MCL over many years could experience increases in blood cholesterol and decreases in blood sugar.
9. Arsenic[22]	None	0.010	Some people who drink water containing arsenic in excess of the MCL over many years could experience skin damage or problems with their circulatory system, and may have an increased risk of getting cancer.
10. Asbestos (10 m)	7 MFL [11]	7 MFL	Asbestos in excess of the MCL over many years may have an increased risk of developing benign intestinal polyps.
11. Barium	2	2	Some people who drink water containing barium in excess of the MCL over many years could experience an increase in their blood pressure.
12. Beryllium	0.004	0.004	Some people who drink water containing beryllium well in excess of the MCL over many years could develop intestinal lesions.
13. Cadmium	0.005	0.005	Some people who drink water containing cadmium in excess of the MCL over many years could experience kidney damage.
14. Chromium (total)	0.1	0.1	Some people who use water containing chromium well in excess of the MCL over many years could experience allergic dermatitis.
15. Cyanide	0.2	0.2	Some people who drink water containing cyanide well in excess of the MCL over many years could experience nerve damage or problems with their thyroid.
16. Fluoride	4.0	4.0	Some people who drink water containing fluoride in excess of the MCL over many years could get bone disease, including pain and tenderness of the bones. Fluoride in drinking water at half the MCL or more may cause mottling of children's teeth, usually in children less than nine years old. Mottling, also known as dental fluorosis, may include brown staining and/or pitting of the teeth, and occurs only in developing teeth before they erupt from the gums.
17. Mercury (inorganic)	0.002	0.002	Some people who drink water containing inorganic mercury well in excess of the MCL over many years could experience kidney damage.
18. Nitrate	10	10	Infants below the age of six months who drink water containing nitrate in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue baby syndrome.

19. Nitrite	1	1	Infants below the age of six months who drink water containing nitrite in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue baby syndrome.
20. Total Nitrate and Nitrite	10	10	Infants below the age of six months who drink water containing nitrate and nitrite in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue baby syndrome.
21. Selenium	0.05	0.05	Selenium is an essential nutrient. However, some people who drink water containing selenium in excess of the MCL over many years could experience hair or fingernail losses, numbness in fingers or toes, or problems with their circulation.
22. Thallium	0.0005	0.002	Some people who drink water containing thallium in excess of the MCL over many years could experience hair loss, changes in their blood, or problems with their kidneys, intestines, or liver.
D. Lead and Copper Requirements:			
23. Lead	Zero	TT [12]	Infants and children who drink water containing lead in excess of the action level could experience delays in their physical or mental development. Children could show slight deficits in attention span and learning abilities. Adults who drink this water over many years could develop kidney problems or high blood pressure.
24. Copper	1.3	TT [13]	Copper is an essential nutrient, but some people who drink water containing copper in excess of the action level over a relatively short amount of time could experience gastrointestinal distress. Some people who drink water containing copper in excess of the action level over many years could suffer liver or kidney damage. People with Wilson's Disease should consult their personal doctor.
E. Synthetic Organic Chemicals (SOCs):			
25. 2,4-D	0.07	0.07	Some people who drink water containing the weed killer 2,4-D well in excess of the MCL over many years could experience problems with their kidneys, liver, or adrenal glands.
26. 2,4,5-TP (Silvex)	0.05	0.05	Some people who drink water containing silvex in excess of the MCL over many years could experience liver problems.
27. Alachlor	Zero	0.002	Some people who drink water containing alachlor in excess of the MCL over many years could have problems with their eyes, liver, kidneys, or spleen, or experience anemia, and may have an increased risk of getting cancer.
28. Atrazine	0.003	0.003	Some people who drink water containing atrazine well in excess of the MCL over many years could experience problems with their cardiovascular system or reproductive difficulties.
29. Benzo(a)pyrene (PAHs)	Zero	0.0002	Some people who drink water containing benzo(a)pyrene in excess of the MCL over many years may experience reproductive difficulties and may have an increased risk of getting cancer.
30. Carbofuran	0.04	0.04	Some people who drink water containing carbofuran in excess of the MCL over many years could experience problems with their blood, or nervous or reproductive systems.
31. Chlordane	Zero	0.002	Some people who drink water containing chlordane in excess of the MCL over many years

			could experience problems with their liver or nervous system, and may have an increased risk of getting cancer.
32. Dalapon	0.2	0.2	Some people who drink water containing dalapon well in excess of the MCL over many years could experience minor kidney changes.
33. Di(2-ethylhexyl)adipate.	0.4	0.4	Some people who drink water containing di (2-ethylhexyl) adipate well in excess of the MCL over many years could experience general toxic effects such as weight loss, liver enlargement or possible reproductive difficulties.
34. Di (2-ethylhexyl)phthalate	Zero	0.006	Some people who drink water containing di(2-ethylhexyl) phthalate in excess of the MCL over many years may have problems with their liver, or experience reproductive difficulties, and may have an increased risk of getting cancer.
35. Dibromochloropropane (DBCP)	Zero	0.0002	Some people who drink water containing DBCP in excess of the MCL over many years could experience reproductive difficulties and may have an increased risk of getting cancer.
36. Dinoseb	0.007	0.007	Some people who drink water containing dinoseb well in excess of the MCL over many years could experience reproductive difficulties.
37. Dioxin (2,3,7,8-TCDD)	Zero	3×10^{-8}	Some people who drink water containing dioxin in excess of the MCL over many years could experience reproductive difficulties and may have an increased risk of getting cancer.
38. Diquat	0.02	0.02	Some people who drink water containing diquat in excess of the MCL over many years could get cataracts.
39. Endothall	0.1	0.1	Some people who drink water containing endothall in excess of the MCL over many years could experience problems with their stomach or intestines.
40. Endrin	0.002	0.002	Some people who drink water containing endrin in excess of the MCL over many years could experience liver problems.
41. Ethylene dibromide	Zero	0.00005	Some people who drink water containing ethylene dibromide in excess of the MCL over many years could experience problems with their liver, stomach, reproductive system, or kidneys, and may have an increased risk of getting cancer.
42. Glyphosate	0.7	0.7	Some people who drink water containing glyphosate in excess of the MCL over many years could experience problems with their kidneys or reproductive difficulties.
43. Heptachlor	Zero	0.0004	Some people who drink water containing heptachlor in excess of the MCL over many years could experience liver damage and may have an increased risk of getting cancer.
44. Heptachlor epoxide	Zero	0.0002	Some people who drink water containing heptachlor epoxide in excess of the MCL over many years could experience liver damage, and may have an increased risk of getting cancer.
45. Hexachlorobenzene	Zero	0.001	Some people who drink water containing hexachlorobenzene in excess of the MCL over many years could experience problems with their liver or kidneys, or adverse reproductive effects, and may have an increased risk of getting cancer.
46. Hexachlorocyclo pentadiene	0.05	0.05	Some people who drink water containing hexachlorocyclopentadiene well in excess of the MCL over many years could experience problems with their kidneys or stomach.

47. Lindane	0.0002	0.0002	Some people who drink water containing lindane in excess of the MCL over many years could experience problems with their kidneys or liver.
48. Methoxychlor	0.04	0.04	Some people who drink water containing methoxychlor in excess of the MCL over many years could experience reproductive difficulties.
49. Oxamyl (Vydate)	0.2	0.2	Some people who drink water containing oxamyl in excess of the MCL over many years could experience slight nervous system effects.
50. Pentachlorophenol	Zero	0.001	Some people who drink water containing pentachlorophenol in excess of the MCL over many years could experience problems with their liver or kidneys, and may have an increased risk of getting cancer.
51. Picloram	0.5	0.5	Some people who drink water containing picloram in excess of the MCL over many years could experience problems with their liver.
52. Polychlorinated biphenyls (PCBs)	Zero	0.0005	Some people who drink water containing PCBs in excess of the MCL over many years could experience changes in their skin, problems with their thymus gland, immune deficiencies, or reproductive or nervous system difficulties, and may have an increased risk of getting cancer.
53. Simazine	0.004	0.004	Some people who drink water containing simazine in excess of the MCL over many years could experience problems with their blood.
54. Toxaphene	Zero	0.003	Some people who drink water containing toxaphene in excess of the MCL over many years could have problems with their kidneys, liver, or thyroid, and may have an increased risk of getting cancer.
F. Volatile Organic Chemicals (VOCS)			
55. Benzene	Zero	0.005	Some people who drink water containing benzene in excess of the MCL over many years could experience anemia or a decrease in blood platelets, and may have an increased risk of getting cancer.
56. Carbon tetrachloride	Zero	0.005	Some people who drink water containing carbon tetrachloride in excess of the MCL over many years could experience problems with their liver and may have an increased risk of getting cancer.
57. Chlorobenzene	0.1	0.1	Some people who drink water containing (monochlorobenzene). chlorobenzene in excess of the MCL over many years could experience problems with their liver or kidneys.
58. o-Dichlorobenzene	0.6	0.6	Some people who drink water containing o-dichlorobenzene well in excess of the MCL over many years could experience problems with their liver, kidneys, or circulatory systems.
59. p-Dichlorobenzene	0.075	0.075	Some people who drink water containing p-dichlorobenzene in excess of the MCL over many years could experience anemia, damage to their liver, kidneys, or spleen, or changes in their blood.
60. 1,2-Dichloroethane	Zero	0.005	Some people who drink water containing 1,2-dichloroethane in excess of the MCL over many years may have an increased risk of getting cancer.

61. 1,1-Dichloroethylene	0.007	0.007	Some people who drink water containing 1,1-dichloroethylene in excess of the MCL over many years could experience problems with their liver.
62. cis-1,2- Dichloroethylene	0.07	0.07	Some people who drink water containing cis-1,2-dichloroethylene in excess of the MCL over many years could experience problems with their liver.
63. trans-1,2- Dichloroethylene	0.1	0.1	Some people who drink water containing Trans-1,2-dichloroethylene well in excess of the MCL over many years could experience problems with their liver.
64. Dichloromethane	Zero	0.005	Some people who drink water containing dichloromethane in excess of the MCL over many years could have liver problems and may have an increased risk of getting cancer.
65. 1,2-Dichloropropane	Zero	0.005	Some people who drink water containing 1,2-dichloropropane in excess of the MCL over many years may have an increased risk of getting cancer.
66. Ethylbenzene	0.7	0.7	Some people who drink water containing ethylbenzene well in excess of the MCL over many years could experience problems with their liver or kidneys.
67. Styrene	0.1	0.1	Some people who drink water containing styrene well in excess of the MCL over many years could have problems with their liver, kidneys, or circulatory system.
68. Tetrachloroethylene	Zero	0.005	Some people who drink water containing tetrachloroethylene in excess of the MCL over many years could have problems with their liver, and may have an increased risk of getting cancer.
69. Toluene	1	1	Some people who drink water containing toluene well in excess of the MCL over many years could have problems with their nervous system, kidneys, or liver.
70. 1,2,4-Trichlorobenzene	0.07	0.07	Some people who drink water containing 1,2,4-trichlorobenzene well in excess of the MCL over many years could experience changes in their adrenal glands.
71. 1,1,1-Trichloroethane	0.2	0.2	Some people who drink water containing 1,1,1-trichloroethane in excess of the MCL over many years could experience problems with their liver, nervous system, or circulatory system.
72. 1,1,2-Trichloroethane	0.003	0.005	Some people who drink water containing 1,1,2-trichloroethane well in excess of the MCL over many years could have problems with their liver, kidneys, or immune systems.
73. Trichloroethylene	Zero	0.005	Some people who drink water containing trichloroethylene in excess of the MCL over many years could experience problems with their liver and may have an increased risk of getting cancer.
74. Vinyl chloride	Zero	0.002	Some people who drink water containing vinyl chloride in excess of the MCL over many years may have an increased risk of getting cancer.
75. Xylenes (total)	10	10	Some people who drink water containing xylenes in excess of the MCL over many years could experience damage to their nervous system.

G. Radioactive Contaminants:			
76. Beta/photon emitters	Zero	4 mrem/yr[14]	Certain minerals are radioactive and may emit forms of radiation known as photons and beta radiation. Some people who drink water containing beta and photon emitters in excess of the MCL over many years may have an increased risk of getting cancer.
77. Alpha emitters	Zero	15 pCi/L[15]	Certain minerals are radioactive and may emit a form of radiation known as alpha radiation. Some people who drink water containing alpha emitters in excess of the MCL over many years may have an increased risk of getting cancer.
78. Combined radium (226 & 228)	Zero	5 pCi/L	Some people who drink water containing radium 226 or 228 in excess of the MCL over many years may have an increased risk of getting cancer.
79. Uranium[23]	Zero	30μg/L	Some people who drink water containing uranium in excess of the MCL over many years may have an increased risk of getting cancer and kidney toxicity.
H. Disinfection Byproducts (DBPs), Byproduct Precursors, and Disinfectant Residuals: Where disinfection is used in the treatment of drinking water, disinfectants combine with organic and inorganic matter present in water to form chemicals called disinfection byproducts (DBPs). EPA sets standards for controlling the levels of disinfectants and DBPs in drinking water, including trihalomethanes (THMs) and haloacetic acids (HAAs): [16]			
80. Total trihalomethanes (TTHMs)	N/A	0.080[17, 18]	Some people who drink water containing trihalomethanes in excess of the MCL over many years may experience problems with their liver, kidneys, or central nervous system, and may have an increased risk of getting cancer.
81. Haloacetic Acids (HAA)	N/A	0.060[19]	Some people who drink water containing haloacetic acids in excess of the MCL over many years may have an increased risk of getting cancer.
82. Bromate	Zero	0.010	Some people who drink water containing bromate in excess of the MCL over many years may have an increased risk of getting cancer.
83. Chlorite	0.08	1.0	Some infants and young children who drink water containing chlorite in excess of the MCL could experience nervous system effects. Similar effects may occur in fetuses of pregnant women who drink water containing chlorite in excess of the MCL. Some people may experience anemia.
84. Chlorine	4 (MRDLG)[20]	4 (MRDL)[21]	Some people who use water containing chlorine well in excess of the MRDL could experience irritating effects to their eyes and nose. Some people who drink water containing chlorine well in excess of the MRDL could experience stomach discomfort.
85. Chloramines	4 (MRDLG)	4 (MRDL)	Some people who use water containing chloramines well in excess of the MRDL could experience irritating effects to their eyes and nose. Some people who drink water containing chloramines well in excess of the MRDL could experience stomach discomfort or anemia.
86a. Chlorine dioxide, where any 2 consecutive samples taken at the entrance to the distribution system are above the MRDL.	0.8 (MRDLG)	0.8 (MRDL)	Some infants and young children who drink water containing chlorine dioxide in excess of the MRDL could experience nervous system effects. Similar effects may occur in fetuses of pregnant women who drink water containing chlorine dioxide in excess of the MRDL. Some people may experience anemia. Add for public notification only: The chlorine dioxide violations reported today are the result of exceedances at the treatment facility only, not within the distribution system

			which delivers water to consumers. Continued compliance with chlorine dioxide levels within the distribution system minimizes the potential risk of these violations to consumers.
86b. Chlorine dioxide, where one or more distribution system samples are above the MRDL.	0.8 (MRDLG)	0.8 (MRDL)	Some infants and young children who drink water containing chlorine dioxide in excess of the MRDL could experience nervous system effects. Similar effects may occur in fetuses of pregnant women who drink water containing chlorine dioxide in excess of the MRDL. Some people may experience anemia. Add for public notification only: The chlorine dioxide violations reported today include exceedances of the EPA standard within the distribution system which delivers water to consumers. Violations of the chlorine dioxide standard within the distribution system may harm human health based on short-term exposures. Certain groups, including fetuses, infants, and young children, may be especially susceptible to nervous system effects from excessive chlorine dioxide exposure.
87. Control of DBP precursors (TOC)	None	TT	Total organic carbon (TOC) has no health effects. However, total organic carbon provides a medium for the formation of disinfection byproducts. These byproducts include trihalomethanes (THMs) and haloacetic acids (HAAs). Drinking water containing these byproducts in excess of the MCL may lead to adverse health effects, liver or kidney problems, or nervous system effects, and may lead to an increased risk of getting cancer.
I. Other Treatment Techniques:			
88. Acrylamide	Zero	TT	Some people who drink water containing high levels of acrylamide over a long period of time could have problems with their nervous system or blood, and may have an increased risk of getting cancer.
89. Epichlorohydrin	Zero	TT	Some people who drink water containing high levels of epichlorohydrin over a long period of time could experience stomach problems, and may have an increased risk of getting cancer.

1. MCLG--Maximum contaminant level goal
2. MCL--Maximum contaminant level
3. For water systems analyzing at least 40 samples per month, no more than 5.0 percent of the monthly samples may be positive for total coliforms. For systems analyzing fewer than 40 samples per month, no more than one sample per month may be positive for total coliforms.
4. There are various regulations that set turbidity standards for different types of systems, including §206, the 1989 Surface Water Treatment Rule, and the 1998 Interim Enhanced Surface Water Treatment Rule. The MCL for the monthly turbidity average is 1 NTU; the MCL for the 2-day average is 5 NTU for systems that are required to filter but have not yet installed filtration (§206).
5. NTU--Nephelometric turbidity unit
6. There are various regulations that set turbidity standards for different types of systems, including §206, the 1989 Surface Water Treatment Rule (SWTR), and the 1998 Interim Enhanced Surface Water Treatment Rule (IESWTR). Systems subject to the Surface Water Treatment Rule (both filtered and unfiltered) may not exceed 5 NTU. In addition, in filtered systems, 95 percent of samples each month must not exceed 0.5 NTU in systems using conventional or direct filtration and must not exceed 1 NTU in systems using slow sand or diatomaceous earth filtration or other filtration technologies approved by the primacy agency.
7. TT--Treatment technique
8. There are various regulations that set turbidity standards for different types of systems, including §206, the 1989 Surface Water Treatment Rule (SWTR), and the 1998 Interim Enhanced Surface Water Treatment Rule (IESWTR). For systems subject to the IESWTR (systems serving at least 10,000 people, using surface water or ground water under the direct influence of surface water), that use conventional filtration or direct filtration, after January 1, 2002, the turbidity level of a system's combined filter effluent may not exceed 0.3 NTU in at least 95 percent of monthly measurements, and the turbidity level of a system's combined filter effluent must not exceed 1 NTU at any time. Systems

subject to the IESWTR using technologies other than conventional, direct, slow sand, or diatomaceous earth filtration must meet turbidity limits set by the primacy agency.
9. The bacteria detected by heterotrophic plate count (HPC) are not necessarily harmful. HPC is simply an alternative method of determining disinfectant residual levels. The number of such bacteria is an indicator of whether there is enough disinfectant in the distribution system.
10. SWTR and IESWTR treatment technique violations that involve turbidity exceedances may use the health effects language for turbidity instead.
11. Millions fibers per liter.
12. Action Level = 0.015 mg/L
13. Action Level = 1.3 mg/L
14. Millirems per years
15. Picocuries per liter
16. Surface water systems and ground water systems under the direct influence of surface water are regulated under Part VIII. Part VIII community and non-transient non-community systems serving ≥10,000 must comply with Part XI DBP MCLs and disinfectant maximum residual disinfectant levels (MRDLs) beginning January 1, 2002. All other community and non-transient noncommunity systems must comply with Part XI DBP MCLs and disinfectant MRDLs beginning January 1, 2005. Part VIII transient non-community systems serving ≥10,000 that use chlorine dioxide as a disinfectant or oxidant must comply with the chlorine dioxide MRDL beginning January 1, 2002. All other transient non-community systems that use chlorine dioxide as a disinfectant or oxident must comply with the chlorine dioxide MRDL beginning January 1, 2004.
17. Community and non-transient non-community systems must comply with Part XXIII TTHM and HAA5 MCLs of 0.080mg/L and 0.060mg/L respectively (with compliance calculated as a locational running annual average) on the schedule in §2301.
18. The MCL for total trihalomethanes is the sum of the concentrations of the individual trihalomethanes.
19. The MCL for haloacetic acids is the sum of the concentrations of the individual haloacetic acids.
20. MRDLG--Maximum residual disinfectant level goal.
21. MRDL--Maximum residual disinfectant level.
22. These arsenic values are effective January 23, 2006.
23. The uranium MCL is effective December 8, 2003 for all community water systems.

603-B List of Acronyms Used in Public Notification Regulation

CCR	Consumer Confidence Report	NTNCWS	Non-Transient Non-Community Water System
CWS	Community Water System	NTU	Nephelometric Turbidity Unit
DBP	Disinfection Byproduct	OGWDW	Office of Ground Water and Drinking Water
EPA	Environmental Protection Agency	OW	Office of Water
HPC	Heterotrophic Plate Count	PN	Public Notification
IESWTR	Interim Enhanced Surface Water Treatment Rule	PWS	Public Water System
IOC	Inorganic Chemical	SDWA	Safe Drinking Water Act
GWR	Ground Water Rule	SMCL	Secondary Maximum Contaminant Level
LCR	Lead and Copper Rule	SOC	Synthetic Organic Chemical
MCL	Maximum Contaminant Level	SWTR	Surface Water Treatment Rule
MCLG	Maximum Contaminant Level Goal	TCR	Total Coliform Rule
MRDL	Maximum Residual Disinfectant Level	TT	Treatment Technique
MRDLG	Maximum Residual Disinfectant Level Goal	TWS	Transient Non-Community Water System
NCWS	Non-Community Water System	VOC	Volatile Organic Chemical
NPDWR	National Primary Drinking Water Regulation		

APPENDIX C
SAMPLING AND ANALYTICAL METHODOLOGY
FOR LEAD AND COPPER

701-C ANALYTICAL METHODS

A. Analyses for lead, copper, pH, conductivity, calcium, alkalinity, orthophosphate, silica, and temperature shall be conducted with the methods in Appendix A § 403-A (A)(1).

1. Analyses for alkalinity, calcium, conductivity, orthophosphate, pH, silica, and temperature may be performed by any person acceptable to the Director. Analyses under this section for lead and copper shall only be conducted by laboratories that have been certified by the EPA. To obtain certification to conduct analyses for lead and copper, laboratories must:

a. Analyze performance evaluation samples which include lead and copper provided by EPA at least once a year by each method for which the laboratory desires certification; and

b. Achieve quantitative acceptance limits as follows:

i. Lead: ±30 % of the actual amount in the Performance Evaluation sample when the actual amount is ≥ 0.005 mg/l. The Practical Quantitation Level, or PQL for lead is 0.005 mg/l.

ii. Copper: ±10 % of the actual amount in the Performance Evaluation sample when the actual amount is ≥ 0.050 mg/l. The Practical Quantitation Level, or PQL for copper is 0.050 mg/l.

c. Achieve method detection limits for lead of 0.001 mg/L according to the procedures in Appendix B of 40 CFR Part 136. This need only be accomplished if the laboratory will be processing source water composite samples under § 712 (A)(1)(c).

d. Be currently certified by EPA to perform analyses to the specifications described in subsection (A)(2) of this section.

2. The Director has the authority to allow the use of previously collected sampling data for purposes of sampling, if the data were collected and analyzed in accordance with the requirements of this section.

3. All lead and copper levels measured between the PQL and the MDL must be either be reported as measured or they can be reported as one-half the PQL specified for lead and copper in subsection (A)(1)(b) of this section. All levels below the lead and copper MDLs must be reported as zero.
4. All copper levels measured between the PQL and the MDL must be either reported as measured or they can be reported as one-half the PQL (0.025 mg/l). All levels below the copper MDL must be reported as zero.

§702-C SAMPLING FOR CORROSIVITY CHARACTERISTICS

A-C [Reserved]

D. Community water systems shall identify whether the following construction materials are present in their distribution system and report to the Director:

Lead from piping, solder, caulking, interior lining of distribution mains, alloys and home plumbing.
Copper from piping and alloys, service lines, and home plumbing.
Galvanized piping, service lines, and home plumbing.
Ferrous piping material such as cast iron and steel.
Asbestos cement pipe.

In addition, the Director may require identification and reporting of other materials of construction present in distribution systems that may contribute contaminants to the drinking water, such as:

Vinyl lined asbestos cement pipe.
Coal tar lined pipes and tanks.

APPENDIX D
SURFACE WATER TREATMENT

801-D ANALYTICAL AND SAMPLING REQUIREMENTS

A. ANALYTICAL REQUIREMENTS. Only the analytical method(s) specified in this subsection, or otherwise approved by the EPA, may be used to demonstrate compliance with the requirements of §§ 803, 804, and 805. Measurements for pH, temperature, turbidity, and residual disinfectant concentrations must be conducted by a party approved by the Director. Measurements for total coliforms, fecal coliforms, and HPC must be conducted by a laboratory certified by the EPA to do such analysis. Until laboratory certification criteria are developed for the analysis of HPC and fecal coliforms, any laboratory certified for total coliform analysis by EPA is deemed certified for HPC and fecal coliform analysis. The following procedures shall be conducted in accordance with the publications listed in the following section. Copies of the methods published in *Standard Methods for the Examination of Water and Wastewater* may be obtained from the American Public Health Association et al., 1015 Fifteenth Street, NW., Washington, DC, 20005; copies of the Minimal Medium ONPG-MUG Method as set forth in the article "National Field Evaluation of a Defined Substrate Method for the Simultaneous Enumeration of Total Coliforms and *Escherichia coli* from Drinking Water: Comparison with the Standard Multiple Tube Fermentation Method" (Edberg et al.), Applied and Environmental Microbiology, Volume 54, PP. 1595-1601, June 1988 (as amended under Erratum, Applied and Environmental Microbiology, Volume 54 p. 3197, December, 1988), may be obtained from the American Water Works Association Research Foundation, 6666 West Quincy Avenue, Denver, Colorado, 80235; and copies of the Indigo Method as set forth in the article "Determination of Ozone in Water by the Indigo Method" (Bader and Hoigne), may be obtained from Ozone Science & Engineering, Pergamon Press Ltd., Fairview Park, Elmsford, New York, 10523. Copies may be inspected at the U.S.EPA, Room EB15, 401 M Street, SW., Washington, DC, 20460 or at the Office of the Federal Register, 800 North Capitol Street, NW., Suite 700, Washington, DC.

1. Public water systems must conduct analysis of pH in accordance with one of the methods listed in Appendix A § 403-A (A)(1) Table 400-A-3. Water systems must conduct analyses of total coliforms, fecal coliforms, heterotrophic bacteria, turbidity and temperature in accordance with one of the following analytical methods and by using analytical test procedures contained in *Technical Notes on Drinking Water Methods*, EPA-600/R-94-173, October 1994, which is available at NTIS PB 95-104766.

TABLE 800-D-1 ANALYTICAL METHODS

Organism	Methodology	Citation[1]
Total Coliforms [2]	Total Coliform Fermentation technique [3,4,5] Total Coliform Membrane Filter technique [6] ONPG-MUG Test [7]	9221A, B, C 9222A, B, C 9223
Fecal Coliforms [2]	Fecal Coliform Procedure [8] Fecal Coliforms Filter Procedure	9221E 9222D
Heterotrophic bacteria [2]	Pour Plate Method	9215B
Turbidity	Nephelometric Method Nephelometric Method Great lakes instruments	2130B 180.1 [8] Method 2 [9]
Temperature		2550

The procedures shall be done in accordance with the documents listed below. Copies of the documents may be obtained from the sources listed below. Information regarding obtaining these documents can be obtained from the Safe Drinking Water Hotline at 800-426-4791. Documents may be inspected at EPA's Drinking Water Docket, 1200 Pennsylvania Ave., NW., Washington, D.C. 20460 (Telephone: 202-260-3027); or at the Office of the Federal Register, 800 North Capitol Street, NW, Suite 700, Washington, D.C. 20408.

[1] Except where noted, all methods refer to Standard Methods for the Examination of Water and Wastewater, 18th edition, 1992, and 19th edition, 1995, American Public Health Association, 1015 Fifteenth Street NW, Washington, D.C., 20005.

[2] The time from sample collection to initiation of analysis may not exceed 8 hours. Systems must hold samples below 10 °C during transit.

[3] Lactose broth, as commercially available, may be used in lieu of lauryl tryptose broth, if the system conducts at least 25 parallel tests between this medium and lauryl tryptose broth using the water normally

tested, and this comparison demonstrates that the false-positive rate and false-negative rate for total coliforms, using lactose broth, is less than 10%.

[4] Media should cover inverted tubes at least one-half to two-thirds after the sample is added.

[5] No requirement exists to run the completed phase on 10% of all total coliform-positive confirmed tubes.

[6] The ONPG-MUG test is also known as the Autoanalysis Colilert System.

[7] A-1 Broth may be held up to three months in a tightly closed screwcap tube at 4 °C.

[8] "Methods for the Determination of Inorganic Substances in Environmental Samples", EPA-600/R-93-100, August 1993. Available at NTIS, PB94-121811.

[9] GLI Method 2, "Turbidity", November 2, 1992, Great Lakes Instruments, Inc., 8855 North 55th Street, Milwaukee, Wisconsin 53223.

2. Water systems must measure residual disinfectant concentrations with one of the analytical methods in the following table. The methods are contained in the 18th, 19th, and 20th editions of Standard Methods for the Examination of Water and Wastewater, 1992 and 1995; any of these three editions may be used. Other analytical test procedures are contained in Technical Notes on Drinking Water Methods, EPA 600/R-94-173, October 1994, which is available at NTIS PB95-104766. If approved by EPA, residual disinfectant concentrations for free chlorine and combined chlorine also may be measured by using DPD colorimetric test kits. Free and total chlorine residuals may be measured continuously by adapting a specified chlorine residual method for use with a continuous monitoring instrument provided the chemistry, accuracy, and precision remain the same. Instruments used for continuous monitoring must be calibrated with a grab sample measurement at least every five days, or with a protocol approved by EPA.

Table 800-D-2 RESIDUAL DISINFECTANT CONCENTRATIONS ANALYTICAL METHODS

Residual	Methodology	Methods
Free chlorine	Amperometric Titration DPD Ferrous Titrimetric DPD Colorimetric Syringaldazine (FACTS)	4500-Cl D 4500-Cl F 4500-Cl G 4500-Cl H
Total Chlorine	Amperometric Titration Amperometric Titration (low level measurement) DPD Ferrous Titrimetric DPD Colorimetric Iodometric Electrode	4500-Cl D 4500-Cl E 4500-Cl F 4500-Cl G 4500-Cl I
Chlorine dioxide	Amperometric Titration DPD Method Amperometric Titration Spectrophotometric	4500-ClO_2 C 4500-ClO_2 D 4500-ClO_2 E EPA Method 327.0, Rev. 1.1
Ozone	Indigo Method	4500-O_3 B

[1] EPA Method 327.0, Rev. 1.1, "Determination of Chlorine Dioxide and chlorite Ion in Drinking Water using Lissamine Green B and Horseradish Peroxidase with Detection by Visible Spectrophotometry," USEPA May 2005, EPA 815-R-05-008. Available online at http;/www.epa.gov/safewater/methods/sourcalt.html.

B. Sampling requirements for systems that do not provide filtration. A public water system that uses a surface water source and does not provide filtration treatment must begin sampling unless the Director has determined in writing that filtration is required pursuant to § 2535 of the NNSDWA, in which case the Director may specify alternative sampling requirements, as appropriate, until filtration is in place. A water system that uses a groundwater source under the direct influence of surface water and does not provide filtration treatment must begin sampling 6 months after the Director determines that the groundwater source is under the direct influence of surface water, unless the Director has determined that filtration is required in writing pursuant to § 2535 of the NNSDWA, in which case the Director may specify alternative sampling requirements, as appropriate, until filtration is in place.

1. Fecal coliform or total coliform density measurements as required by § 803 (A)(1) must be performed on representative source water samples immediately prior to the first or only point of disinfectant application. The system must sample for fecal or total coliforms at the following minimum frequency each week the system serves water to the public:

TABLE 800-D-3 SAMPLE FREQUENCY

SYSTEM SIZE (persons served)	SAMPLES/WEEK[1]
≤500	1
501 TO 3,300	2
3,301 TO 10,000	3
10,001 TO 25,000	4
>25,000	5

[1]Must be taken on separate days.

Also, one fecal or total coliform density measurement must be made every day the system serves water to the public and the turbidity of the source water exceeds 1 NTU (these samples count towards the weekly coliform sampling requirement) unless the Director determines that the system, for logistical reasons outside the system's control, cannot have the sample analyzed within 30 hours of collection.

2. Turbidity measurements as required by § 803 (A)(2) must be performed on representative grab samples of source water immediately prior to the first or only point of disinfectant application every four hours (or more frequently) that the system serves water to the public. A public water system may substitute continuous turbidity sampling for grab sample sampling if it validates the continuous measurement for accuracy on a regular basis using a protocol approved by the Director.

3. The total inactivation ratio for each day that the system is in operation must be determined based on the $CT_{99.9}$ values in Tables 800-D-4 through 800-D-11 of this section, as appropriate. The parameters necessary to determine the total inactivation ratio must be monitored as follows:

   a. The temperature of the disinfected water must be measured at least once per day at each residual disinfectant concentration sampling point.

   b. If the system uses chlorine, the pH of the disinfected water must be measured at least once per day at each chlorine residual disinfectant concentration sampling point.

   c. The disinfectant contact time(s) ("T") must be determined for each day during peak hourly flow.

   d. The residual disinfectant concentration(s) ("C") of the water before or at the first customer must be measured each day during peak hourly flow.

   e. If a system uses a disinfectant other than chlorine, the system may demonstrate to the Director, through the use of a Director-approved protocol for on-site disinfection challenge studies or other information satisfactory to the Director, that $CT_{99.9}$ values other than those specified in Tables 800-D-10 and 800-D-11 in this section or other operational parameters are adequate to demonstrate that the system is achieving the minimum inactivation rates required by § 804 (A)(1).

TABLE 800-D-4 CT VALUES ($CT_{99.9}$) FOR 99.9 PERCENT INACTIVATION OF GIARDIA LAMBLIA CYSTS BY FREE CHLORINE AT 0.5 °C OR LOWER[1]

Residual mg/L	pH						
	≤6.0	6.5	7.0	7.5	8.0	8.5	≤9.0
≤0.4	137	163	195	237	277	329	390
0.6	141	168	200	239	286	342	407
0.8	145	172	205	246	295	354	422
1.0	148	176	210	253	304	365	437

1.2	152	180	215	259	313	376	451
1.4	155	184	221	266	321	387	464
1.6	157	189	226	273	329	397	477
1.8	162	193	231	279	338	407	489
2.0	165	197	236	286	346	417	500
2.2	169	201	242	297	353	426	511
2.4	172	205	247	298	361	435	522
2.6	175	209	252	304	368	444	533
2.8	178	213	257	310	375	452	543
3.0	181	217	261	316	382	460	552

[1]These CT values achieve greater than a 99.99 % inactivation of viruses. CT values between the indicated pH values may be determined by linear interpolation. CT values between the indicated temperature of different tables may be determined by linear interpolation. If no interpolation is used, use the $CT_{99.9}$ value at the lower temperature and at the higher pH.

TABLE 800-D-5 CT VALUES ($CT_{99.9}$) FOR 99.9 PERCENT INACTIVATION OF GIARDIA LAMBLIA CYSTS BY FREE CHLORINE AT 5.0 °C[1]

Free Residual mg/L	pH						
	≤6.0	6.5	7.0	7.5	8.0	8.5	≤9.0
≤0.4	97	117	139	166	198	236	279
0.6	100	120	143	171	204	244	291
0.8	103	122	146	175	210	252	301
1.0	105	125	149	179	216	260	312
1.2	107	127	152	183	221	267	320
1.4	109	130	155	187	227	274	329
1.6	111	132	158	192	232	281	337
1.8	114	135	162	196	238	287	345
2.0	116	138	165	200	243	294	353
2.2	118	140	169	204	248	300	361
2.4	120	143	172	209	253	306	368
2.6	122	146	175	213	258	312	375
2.8	124	148	178	217	263	318	382
3.0	126	151	182	221	268	324	389

[1]These CT values achieve greater than a 99.99 % inactivation of viruses. CT values between the indicated pH values may be determined by linear interpolation. CT values between the indicated temperature of different tables may be determined by linear interpolation. If no interpolation is used, use the $CT_{99.9}$ value at the lower temperature, and at the higher pH.

TABLE 800-D-6 CT VALUES ($CT_{99.9}$) FOR 99.9 PERCENT INACTIVATION OF GIARDIA LAMBLIA CYSTS BY FREE CHLORINE AT 10.0 °C[1]

Free Residual mg/L	pH						
	≤6.0	6.5	7.0	7.5	8.0	8.5	≤9.0

≤0.4	73	88	104	125	149	177	209
0.6	75	90	107	128	153	183	218
0.8	78	92	110	131	158	189	226
1.0	79	94	112	134	162	195	234
1.2	80	95	114	137	166	200	240
1.4	82	98	116	140	170	206	247
1.6	83	99	119	144	174	211	253
1.8	86	101	122	147	179	215	259
2.0	87	104	124	150	182	221	265
2.2	89	105	127	153	186	225	271
2.4	90	107	129	157	190	230	276
2.6	92	110	131	160	194	234	281
2.8	93	111	134	163	197	239	287
3.0	95	113	137	166	201	243	292

[1]These CT values achieve greater than a 99.99 % inactivation of viruses. CT values between the indicated pH values may be determined by linear interpolation. CT values between the indicated temperatures of different tables may be determined by linear interpolation. If no interpolation is used, use the $CT_{99.9}$ value at the lower temperature, and at the higher pH.

TABLE 800-D-7 CT VALUES ($CT_{99.9}$) FOR 99.9 PERCENT INACTIVATION OF GIARDIA LAMBLIA CYSTS BY FREE CHLORINE AT 15.0 °C[1]

Free Residual mg/L	pH						
	≤6.0	6.5	7.0	7.5	8.0	8.5	≤9.0
≤0.4	49	59	70	83	99	118	140
0.6	50	60	72	86	102	122	146
0.8	52	61	73	88	105	126	151
1.0	53	63	75	90	108	130	156
1.2	54	64	76	92	111	134	160
1.4	55	65	78	94	114	137	165
1.6	56	66	79	96	116	141	169
1.8	57	68	81	98	119	144	173
2.0	58	69	83	100	122	147	177
2.2	59	70	85	102	124	150	181
2.4	60	72	86	105	127	153	184
2.6	61	73	88	107	129	156	188
2.8	62	74	89	109	132	159	191
3.0	63	76	91	111	134	162	195

[1]These CT values achieve greater than a 99.99 % inactivation of viruses. CT values between the indicated pH values may be determined by linear interpolation. CT values between the indicated temperatures of different tables may be determined by linear interpolation. If no interpolation is used, use the $CT_{99.9}$ value at the lower temperature, and at the higher pH.

TABLE 800-D-8 CT VALUES ($CT_{99.9}$) FOR 99.9 PERCENT INACTIVATION OF GIARDIA LAMBLIA CYSTS BY FREE CHLORINE AT 20.0 °C[1]

Free Residual mg/L	pH						
	≤6.0	6.5	7.0	7.5	8.0	8.5	≤9.0
≤0.4	36	44	52	62	74	89	105
0.6	38	45	54	64	77	92	109
0.8	39	46	55	66	79	95	113
1.0	39	47	56	67	81	98	117
1.2	40	48	57	69	83	100	120
1.4	41	49	58	70	85	103	123
1.6	42	50	59	72	87	105	126
1.8	43	51	61	74	89	108	129
2.0	44	52	62	75	91	110	132
2.2	44	53	63	77	93	113	135
2.4	45	54	65	78	95	115	138
2.6	46	55	66	80	97	117	141
2.8	47	56	67	81	99	119	143
3.0	47	57	68	83	101	122	146

[1]These CT values achieve greater than a 99.99 % inactivation of viruses. CT values between the indicated pH values may be determined by linear interpolation. CT values between the indicated temperatures of different tables may be determined by linear interpolation. If no interpolation is used, use the $CT_{99.9}$ value at the lower temperature, and at the higher pH.

TABLE 800-D-9 CT VALUES ($CT_{99.9}$) FOR 99.9 PERCENT INACTIVATION OF GIARDIA LAMBLIA CYSTS BY FREE CHLORINE AT 25.0 °C[1] AND HIGHER

Free Residual mg/L	pH						
	≤6.0	6.5	7.0	7.5	8.0	8.5	≤9.0
≤0.4	24	29	35	42	50	59	70
0.6	25	30	36	43	51	61	73
0.8	26	31	37	44	53	63	75
1.0	26	31	37	45	54	65	78
1.2	27	32	38	46	55	67	80
1.4	27	33	39	47	57	69	82
1.6	28	33	40	48	58	70	84
1.8	29	34	41	49	60	72	86
2.0	29	35	41	50	61	74	88
2.2	30	35	42	51	62	75	90
2.4	30	36	43	52	63	77	92
2.6	31	37	44	53	65	78	94
2.8	31	37	45	54	66	80	96

3.0	32	38	46	55	67	81	97

[1]These CT values achieve greater than a 99.99 % inactivation of viruses. CT values between the indicated pH values may be determined by linear interpolation. CT values between the indicated temperatures of different tables may be determined by linear interpolation. If no interpolation is used, use the $CT_{99.9}$ value at the lower temperature, and at the higher pH.

TABLE 800-D-10 CT VALUES ($CT_{99.9}$) FOR 99.9 PERCENT INACTIVATION OF GIARDIA LAMBLIA CYSTS BY CHLORINE DIOXIDE AND OZONE[1]

Temperature	≤1°C	5 °C	10 °C	15 °C	20 °C	≥25 °C
Chlorine Dioxide	63	26	23	19	15	11
Ozone	2.9	1.9	1.4	0.95	0.72	0.48

[1]These CT values achieve greater than 99.99 % inactivation of viruses. CT values between the indicated temperatures may be determined by linear interpolation. If no interpolation is used, use the $CT_{99.9}$ value at the lower temperature for determining $CT_{99.9}$ values between indicated temperatures.

TABLE 800-D-11 CT VALUES ($CT_{99.9}$) FOR 99.9 PERCENT INACTIVATION OF GIARDIA LAMBLIA CYSTS BY CHLORAMINES[1]

Temperature					
≤1 °C	5 °C	10 °C	15 °C	20 °C	25 °C
3,800	2,200	1,850	1,500	1,100	750

[1]These values are for pH values of 6 to 9. These CT values may be assumed to achieve greater than 99.99 % inactivation of viruses only if chlorine is added and mixed in the water prior to the addition of ammonia. If this condition is not met, the system must demonstrate, based on on-site studies or other information, as approved by the Director, that the system is achieving at least 99.99 % inactivation of viruses. CT values between the indicated temperatures may be determined by linear interpolation. If no interpolation is used, use the $CT_{99.9}$ value at the lower temperature for determining $CT_{99.9}$ values between indicated temperatures.

4. The total inactivation ratio must be calculated as follows:

   a. If the system uses only one point of disinfectant application, the system may determine the total inactivation ratio based on either of the following two methods:

      1. One inactivation ratio ($CTcalc/CT_{99.9}$) is determined before or at the first customer during peak hourly flow and if the $CTcalc/CT_{99.9} \geq 1.0$, the 99.9 % *Giardia lamblia* inactivation requirement has been achieved; or

      2. Successive $CTcalc/CT_{99.9}$ values, representing sequential inactivation ratios, are determined between the point of disinfectant application and a point before or at the first customer during peak hourly flow. Under this alternative, the following method must be used to calculate the total inactivation ratio:

(1) Determine $\frac{CTcalc}{CT_{99.9}}$ for each sequence.

(2) Add the $\frac{CTcalc}{CT_{99.9}}$ values together $\left(\sum \frac{(CTcalc)}{CT_{99.9}}\right)$

(3) *If* $\sum \left(\frac{CTcalc}{CT_{99.9}}\right) \geq 1.0$, the 99.9 percent Giardia *Lamblia* inactivation requirement has been achieved.

b. If the system uses more than one point of disinfectant application before or at the first customer, the system must determine the CT value of each disinfection sequence immediately prior to the next point of disinfectant application during peak hourly flow. The CTcalc/$CT_{99.9}$ value of each sequence and

$$\sum \frac{CTcalc}{CT_{99.9}}$$

must be calculated using the method in subsection (B)(4)(a)(2) of this section to determine if the system is in compliance with § 804 (A).

c. Although not required, the total percent inactivation for a system with one or more points of residual disinfectant concentration sampling may be calculated by solving the following equation:

$$\text{Percent inactivation} = 100 - \frac{100}{10^{z}}$$

$$\text{where } z = 3 \times \sum \left(\frac{CTcalc}{CT_{99.9}} \right)$$

5. The residual disinfectant concentration of the water entering the distribution system must be monitored continuously, and the lowest value must be recorded each day, except that if there is a failure in the continuous sampling equipment, grab sampling every 4 hours may be conducted in lieu of continuous sampling, but for no more than 5 working days following the failure of the equipment, and systems serving 3,300 or fewer persons may take grab samples in lieu of providing continuous sampling on an ongoing basis at the frequencies prescribed below:

TABLE 800 -D- 12 SAMPLING INTERVALS

SYSTEM SIZE BY POPULATION	SAMPLES/DAY[1]
<500	1
501 to 1,000	2
1,001 to 2,500	3
2,501 to 3,300	4

[1]The day's samples cannot be taken at the same time. The sampling intervals are subject to the Director's review and approval.

If at any time the residual disinfectant concentration falls below 0.2 mg/l in a system using grab sampling in lieu of continuous sampling, the system must take a grab sample every 4 hours until the residual concentration is equal to or greater than 0.2 mg/l.

6. a. The residual disinfectant concentration must be measured at least at the same points in the distribution system and at the same time as total coliforms are sampled, as specified in § 404, except that the Director may allow a public water system which uses both a surface water source or a groundwater source under direct influence of surface water, and a groundwater source, to take disinfectant residual samples at points other than the total coliform sampling points if the Director determines that such points are more representative of treated (disinfected) water quality within the distribution system. Heterotrophic bacteria, measured as heterotrophic plate count (HPC) as specified in subsection (A)(1) of this section, may be measured in lieu of residual disinfectant concentration.

b. If the Director determines, based on site-specific considerations, that a system has no means for having a sample transported and analyzed for HPC by a certified laboratory under the requisite time and temperature conditions specified by subsection (A)(1) of this section and that the system is providing adequate disinfection in the distribution system, the requirements of subsection (B)(6)(a)

of this section do not apply to that system.

C. Sampling requirements for systems using filtration treatment.

A public water system that uses a surface water source or a groundwater source under the influence of surface water and provides filtration treatment must monitor in accordance with this subsection (C) when filtration is installed.

1. Turbidity measurements as required by § 805 must be performed on representative samples of the system's filtered water every four hours (or more frequently) that the system serves water to the public. A water system may substitute continuous turbidity sampling for grab sampling if it validates the continuous measurement for accuracy on a regular basis using a protocol approved by the Director. For any systems using slow sand filtration or filtration treatment other than conventional treatment, direct filtration, or diatomaceous earth filtration, the Director may reduce the sampling frequency to once per day if it determines that less frequent sampling is sufficient to indicate effective filtration performance. For systems serving 500 or fewer persons, the Director may reduce the turbidity sampling frequency to once per day, regardless of the type of filtration treatment used, if the Director determines that less frequent sampling is sufficient to indicate effective filtration performance.

2. The residual disinfectant concentration of the water entering the distribution system must be monitored continuously, and the lowest value must be recorded each day, except that if there is a failure in the continuous sampling equipment, grab sampling every 4 hours may be conducted in lieu of continuous sampling, but for no more than 5 working days following the failure of the equipment, and systems serving 3,300 of fewer persons may take grab samples in lieu of providing continuous sampling on an ongoing basis at the frequencies each day prescribed below:

TABLE 800-D-13 SAMPLING FREQUENCIES

SYSTEM SIZE BY POPULATION	SAMPLES/DAY[1]
±500	1
501 to 1,000	2
1,001 to 2,500	3
2,501 to 3,300	4

[1]The day's samples cannot be taken at the same time. The sampling intervals are subject to the Director's review and approval.

If at any time the residual disinfectant concentration falls below 0.2 mg/l in a system using grab sampling in lieu of continuous sampling, the system must take a grab sample every 4 hours until the residual disinfectant concentration is equal to or greater than 0.2 mg/l.

3. a. The residual disinfectant concentration must be measured at least at the same points in the distribution system and at the same time as total coliforms are sampled, as specified in § 404, except that the Director may allow a public water system which uses both a surface water source or a groundwater source under direct influence of surface water, and a groundwater source to take disinfectant residual samples at points other than the total coliform sampling points if the Director determines that such points are more representative of treated (disinfected) water quality within the distribution system. Heterotrophic bacteria, measured as heterotrophic plate count (HPC) as specified in subsection (A)(1) of this section, may be measured in lieu of residual disinfectant concentration.

b. If the Director determines, based on site-specific considerations, that a system has no means for having a sample transported and analyzed for HPC by a certified laboratory under the requisite time and temperature conditions specified by subsection (A)(1) of this section and that the system is providing adequate disinfection in the distribution system, the requirements of subsection (C)(3)(a) of this section do not apply to that system.

Addendum: Baffling Classification-*Guidance Manual for Compliance with the Filtration and Disinfection*

Requirements for Public Water Systems using Surface Water Sources, March, 1991 Edition, Science and Technology Branch Criteria and Standards Division, Office of Drinking Water, U.S. Environmental Protection Agency, Washington, D.C.

TABLE 800 -D- 14 BAFFLING CLASSIFICATION

BAFFLING CONDITION	T_{10}/T	BAFFLING DESCRIPTION
Unbaffled (mixed flow)	0.1	None, agitated basin, very low length to width ratio, high inlet and outlet flow velocities.
Poor	0.3	Single or multiple unbaffled inlets and outlets, no intra-basin baffles.
Average	0.5	Baffled inlet or outlet with some intra-basin baffles.
Superior	0.7	Perforated inlet baffle, serpentine or perforated intra-basin baffles, outlet weir or perforated launders.
Perfect (plug flow)	1.0	Very high length to width ratio (pipeline flow), perforated inlet, outlet, and intra-basin baffles.

APPENDIX E
DISINFECTANT RESIDUALS, DISINFECTION BYPRODUCTS AND DISINFECTION BYPRODUCT PRECURSORS

1101-E ANALYTICAL REQUIREMENTS

A. General

1. Systems must use only the analytical method(s) specified in Part 1100 and Appendix E, or otherwise approved by EPA in the federal register, to demonstrate compliance with the requirements under Part 1100 or Appendix E. These methods are effective for compliance monitoring February 16, 1999, unless a different date is specified in this section or by this Director.

2. The following documents are incorporated by reference. Copies may be inspected at EPA's Drinking Water Docket, 1301 Constitutional Avenue, NW, EPA West, Room B102, Washington, DC, 20460, or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202-741-6030, or go to: http://www.archives.gov/federal_register/code_or_federal_regulations/ibr_locations.htm 1. EPA Method 552.1 is in Methods for the Determination of Organic Compounds in Drinking Water-Supplement II, USEPA, August 1992, EPA/600/R-92/129 (available through National Information Technical Service (NTIS), PB92-207703). EPA Methods 502.2, 524.2, 551.1, and 552.2 are in Methods for the Determination of Organic Compounds in Drinking Water-Supplement III, USEPA, August 1995, EPA/600/R-95/131 (available through NTIS, PB95-261616). EPA Method 300.0 is in Methods for Determination of Inorganic Substances in Environmental Samples, USEPA, August 1993, EPA/600/R-93/100 (available through NTIS, PB94-121811). EPA Methods 300.1 and 321.8 are in Methods for the Determination of Organic and Inorganic Compounds in Drinking Water, Volume 1, USEPA, August 2000, EPA 815-R-00-014 (Available through NTIS, PB2000-106981). EPA Method 317.0, Revision 2.0, "Determination of Inorganic Oxyhalide Disinfection By-Products in Drinking Water Using Ion Chromatography with the Addition of a Postcolumn Reagent for Trace Bromate Analysis," USEPA, July 2001, EPA 815-B-01-001, EPA Method 326.0, Revision 1.0, "Determination of Inorganic Oxyhalide Disinfection By-Products in Drinking Water Using Ion Chromatography Incorporating the Addition of a Suppressor Acidified Postcolumn Reagent for Trace Bromate Analysis," USEPA, June 2002, EPA 815-R-03-007, EPA Method 327.0, Revision 1.1, "Determination of Chlorite Ion in Drinking Water Using Lissamine Green B and Horseradish Peroxidase with Detection by Visible Spectrophotometry," USEPA, May 2005, EPA 815-R-05-008 and EPA Method 552.3, Revision 1.0, "Determination of Haloacetic Acids and Dalapon in Drinking Water by Liquid-liquid Microextraction, Derivatization, and Gas Chromatography with Electron Capture Detection," USEPA, July 2003, EPA-815-B-03-002 can be accessed and downloaded directly on-line at http://www.epa/gov/safewater/methods/sourcalt.html. EPA Method 415.3, Revision 1.1, "Determination of Total Organic Carbon and Specific UV Absorbance at 254nm in Source Water and Drinking Water," USEPA, February 2005, EPA/600/R-05/055 can be accessed and downloaded directly online at www.epa.gov/nerlcwww/ordmeth.htm. Standard Methods 4500-Cl D, 4500-Cl E, 4500-Cl F, 4500-Cl G, 4500-Cl H, 4500-Cl I, 4500-ClO_2 D, 4500-ClO_2 E, 6251 B, and 5910 B shall be followed in accordance with Standard Methods for the Examination of Water and Wastewater, 19th or 20th Editions, American Public Health Association, 1995 and 1998, respectively. The cited methods published in either edition may be used. Standard Methods shall be followed in accordance with the Supplement to the 19th Edition of Standard methods for the Examination of Water and Wastewater, or the Standard Methods for the Examination of Water and Wastewater, 20th Edition, American Public Health Association, 1996 and 1998, respectively. The cited methods published in either edition may be used. Copies may be obtained from the American Public Health Association, 1015 Fifteenth Street, NW, Washington, DC, 20005. Standard Methods 4500-Cl D-00, 4500-Cl E-00, 4500-Cl F-00, 4500-Cl G-00, 4500-Cl H-00, 4500-Cl I-00, 4500-ClO_2 E-00, 6251 B-94, 5310 B-00, 5310 C-00, and 5310 D-00, and 5910 B-00 are available at http://www.standardmethods.org or at EPA's Water Docket. The year in which each method was approved by the Standard Methods Committee is designated by the last two digits in the method number. The methods listed are the only Online versions that are IBR-approved. ASTM Methods D 1253-86 and D1253-86 (Reapproved 1996) shall be followed in accordance with the Annual Book of ASTM Standards, Volume 11.01, American Society for Testing and Materials International, 1996 or any ASTM edition containing the IBR-approved version of the method may be used. ASTM Standards, Volume 11.01, American Society for Testing and Materials International, 2004 or any ASTM edition containing the IBR-approved version of the method may be used. ASTM Method D 6581-00 shall be followed in accordance with the Annual Book Of ASTM Standards, Volume 11.01, American Society for Testing and Materials International, 2001 or any ASTM edition containing the IBR-approved version of the method may be used; copies may be obtained from the American Society for

Testing and Materials International, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959

B. Disinfection byproducts

1. Systems must measure disinfection byproducts by the methods (as modified by the footnotes) listed in the following table:

Table 1101-E-1 Approved Methods for Disinfection Byproduct Compliance Monitoring

Contaminant and methodology[1]	EPA method	Standard method[2]	SM Online[9]	ASTM method[3]
TTHM				
P&T/GC/EICD & PID	502.2[4]	.....	.....	
P&T/GC/MS	524.2	.....	.....	
LLE/GC/ECD	551.1	.....	.....	
HAA5				
LLE(diamenthane)/GC/ECD	.....	6251 B[5]	6251 B-94	
SPE(acidic methanol)/GC/ECD	552.1[5]	.....	.....	
LLE(acidic methanol)/GC/ECD	552.2, 552.3	.....	.....	
Bromate				
Ion chromatography	300.1	.....	.....	D 6581-00
Ion chromatography & post column reaction	317.0 Rev 2.0[6], 326.0[6]	.....	.....	
IC/ICP-MS	321.8[6,7]	.....	.....	
Chlorite				
Amperometric titration	.....	4500-ClO_2E[8]	4500-ClO_2 E-00[8]	
Spectrophotometry	327.0 Rev 1.1[8]	.....	.....	
Ion chromatography	300.0, 300.1, 317.0, Rev 2.0, 326.0	.....	.....	D 6581-00

[1]P&T = purge and trap; GC=gas chromatography;EICD=electrolytic conductivity detector; PID=photoionization detector; MS=mass spectrometer; LLE=liquid/liquid extraction; ECD=electron capture detector;SPE=solid phase extraction; ICP-MS= inductively coupled plasma/mass spectrometer.
[2]19th and 20th editions of Standard Methods for the Examination of Water and Wastewater, 1995 and 1998, respectively, American Public Health Association; either of these editions may be used.
[3]Annual Book of ASTM Standards, 2001or any year containing the cited version of the method, Vol 11.01.
[4]If TTHMs are the only analytes being measured in the sample, then a PID is not required.
[5]The samples must be extracted within 14 days of sample collection.
[6]Ion chromatography & post column reaction or IC/ICP-MS must be used for monitoring of bromate for purposes of demonstrating eligibility or reduced monitoring, as prescribed in §1103(B)(3)(b).
[7]Samples must be preserved at the time of sampling with 50 mg ethylenediamine (EDA)/L of sample and must be analyzed within 28 days.
[8]Amperometric titration or spectrophotometry may be used for routine daily monitoring of chlorite at the entrance to the distribution system, as prescribed in §1103(B)(2)(a)(1). Ion chromatography must be used for routine monthly monitoring of chlorite and additional monitoring of chlorite in the distribution system, as prescribed in §1103(B)(2)(a)(2) and (B)(2)(b).
[9]The Standard Methods Online version that is approved is indicated by the last two digits in the method number which is the year of approval by the Standard Method Committee. Standard Methods Online are available at http://www.standardmethods.org.

2. Analyses under this section for disinfection byproducts must be conducted by laboratories that have received certification by EPA or the Director, except as specified under paragraph(D)(3)of this section. To receive certification to conduct analyses for the DBP contaminants in §§207, and Parts XXII and XXIII or this part, the laboratory must:

a. Analyze Performance Evaluation (PE) samples that are acceptable to EPA at least once during each consecutive 12 month period by each method for which the laboratory desires certification.

b. Until March 31, 2007, in these analyses of PE samples, the laboratory must achieve quantitative results within the acceptance limit on a minimum of 80% of the analytes included in each PE sample. The acceptance limit is defined as the 95% confidence interval calculated around the mean of the PE study between a maximum and minimum acceptance limit of +/-50% and +/-15% of the study mean.

c. Beginning April 1, 2007, the laboratory must achieve quantitative results on the PE sample analyses that are within the following acceptance limits:

Table 1101-E-2 - Acceptance limits for Disinfection Byproducts

DBP	Acceptance limits (percent of true value)	Comments
TTHM		
Chloroform	±20	Laboratory must meet all 4 individual THM acceptance limits in order to successfully pass a PE sample for TTHM
Bromodichloromethane	±20	
Dibromochloromethane	±20	
Bromoform	±20	
HAA5		
Monochloroacetic Acid	±40	Laboratory must meet the acceptance limits for 4 out of 5 of the HAA5 compounds in order to successfully pass a PE sample of HAA5
Dichloroacetic Acid	±40	
Trichloroacetic Acid	±40	
Monobromoacetic Acid	±40	
Dibromoacetic Acid	±40	
Chlorite	±30	
Bromate	±30	

d. Beginning April 1, 2007, report quantitative data for concentrations at least as low as the ones listed in the following table for all DBP samples analyzed for compliance with §§208, and Parts XXII and XXIII of this part:

Table 1103-E-3 Minimum Reporting Level for Disinfection Byproducts

DBP	Minimum reporting level (mg/L)[1]	Comments
TTHM[2]		
Chloroform	0.0010	
Bromodichloromethane	0.0010	

Dibromochloromethane	0.0010	
Bromoform	0.0010	
HAA5[2]		
Monochloroacetic Acid	0.0020	
Dichloroacetic Acid	0.0010	
Trichloroacetic Acid	0.0010	
Monobromoacetic Acid	0.0010	
Dibromoacetic Acid	0.0010	
Chlorite	0.020	Applicable to monitoring as prescribed in §1103 (B)(2)(a)(ii) and (B)(2)(b)
Bromate	0.0050 or 0.0010	Laboratories that use EPA Methods 317.0 Revision 2.0, 326.0, or 312.8 must meet a 0.0010mg/L MRL for bromate

[1]The calibration curve must encompass the regulatory minimum reporting level (MRL) concentrations lower than the regulatory MRL as long as the precision and accuracy criteria are met by analyzing an MRL check standard at the lowest reporting limit chosen by the laboratory. The laboratory must verify the accuracy of the calibration curve at the MRL concentration by analyzing an MRL check standard with a concentration less than or equal to 110% of the MRL with each batch of samples. The measured concentration for the MRL check standard must be ±50% of the expected value, if any field sample in the batch has a concentration less than 5 times the regulatory MRL. Method requirements to analyze higher concentration check standards and meet tighter acceptance criteria for them must be met in addition to the MRL check standard requirement.
[2]When adding the individual trihalomethane or haloacetic acid concentration to calculate the TTHM or HAA5 concentrations, respectively, a zero is used for any analytical results that is less than the MRL concentration for that DBP, unless otherwise specified by the Director.

3. A party approved by EPA or NNEPA must measure daily chlorite samples at the entrance to the distribution system.

C. Disinfectant residuals.

1. Systems must measure residual disinfectant concentrations for free chlorine, combined chlorine (chloramines), and chlorine dioxide by the methods listed in the following table:

Table 1101-E-4 Approved Methods for Disinfectant Residual Compliance Monitoring

Methodology	Standard Method (19^{th} or 20^{th} ED)	SM Online[2]	ASTM method	EPA method	Residual Measured [1]			
					Free Chlorine	Combined Chlorine	Total Chlorine	Chlorine dioxide
Amperometric Titration	4500-C D	4500-C D-00	D 1253-86 (96), 03		X	X	X	
Low Level Amperometric Titration	4500-C E	4500-C E-00					X	
DPD Ferrous Titrimetric	4500-C F	4500-C F-00			X	X	X	
DPD Colorimetric	4500-C G	4500-C G-00			X	X	X	
Syringaldazine	4500-C H	4500-C			X			

(FACTS)		H-00						
Iodometric Electrode	4500-C I	4500-C I-00					X	
DPD	4500-C O_2 D							X
Amperometric Method II	4500 C O_2 E	4500-C O_2 E-00						X
Lissamine Green Spectrophotometric.				327.0 Rev				X

[1]X indicates method is approved for measuring specified disinfectant residual. Free chlorine or total chlorine may be measured for demonstrating compliance with the chlorine MRDL and combined chlorine, or total chlorine may be measured for demonstrating compliance with the chloramine MRDL.
[2]The standard Methods Online version that is approved is indicated by the last two digits in the method number which is the year of approval by the Standard Method Committee. Standard Methods Online are available at http://www.standardmethods.org.

2. If approved by the NNEPA, systems may also measure residual disinfectant concentrations for chlorine, chloramines, and chlorine dioxide by using DPD colorimetric test kits.

3. A party approved by EPA or NNEPA must measure residual disinfectant concentration.

D. Additional analytical methods. Systems required to analyze parameters not included in paragraphs (B) and (C) of this section must use the following methods. A party approved by EPA or NNEPA must measure these parameters.

1. Alkalinity. All methods allowed in Appendix C § 701-C (A) for measuring alkalinity.

2. Bromide. EPA Method 300.0, 300.1, 317.0 Revision 2.0, 326.0, or ASTM D 6581-00.

3. Total Organic Carbon (TOC). Standard Method 5310 B or 5310 B-00 (High-Temperature Combustion Method) or Standard Method 5310 C or 5210 C-00 (Persulfate-Ultraviolet or Heated-Persulfate Oxidation Method) or Standard Method 5310 D or 5310 D-00(Wet-Oxidation Method)or EPA Method 415.3 Revision 1.1. Inorganic carbon must be removed from the samples prior to analyses. TOC samples may not be filtered prior to analysis. TOC samples must be acidified at the time of sample collection to achieve pH less than or equal to 2 with minimal addition of the acid specified in the method or by the instrument manufacturer. Acidified TOC samples must be analyzed within 28 days.

4. Specific Ultraviolet Absorbance (SUVA). SUVA is equal to the UV absorption at 254nm (UV_{254}) (measured in m^{-1} divided by the dissolved organic carbon (DOC) concentration (measured as mg/L). In order to determine SUVA, it is necessary to separately measure UV_{254} and DOC. When determining SUVA, systems must use the methods stipulated in paragraph (D)(4)(i) of this section to measure DOC and the method stipulated in paragraph (D)(4)(ii) of this section to measure (UV_{254}). SUVA must be determined on water prior to the addition of disinfectants/oxidants by the system. DOC and (UV_{254}) samples used to determine a SUVA value must be taken at the same time and at the same location.

a. Dissolved Organic Carbon (DOC). Standard Method 5310 B or 5310 B-00(High- Temperature Combustion Method) or Standard Method 5310 C or 5310 C-00(Persulfate- Ultraviolet or Heated-Persulfate Oxidation Method) or Standard Method 5310 D or 5310 D-00(Wet-Oxidation Method) or EPA method 415.3 Revision 1.1. DOC samples must be filtered through the 0.45 μm pore diameter filter as soon as practical after sampling, not to exceed 48 hours. After filtration, DOC samples must be acidified to achieve pH less than or equal to 2 with minimal addition of the acid specified in the method or by the instrument manufacturer. Acidified DOC samples must be analyzed within 28 days of sample collection. Inorganic carbon must be removed from the samples prior to analysis. Water passed through the filter prior to filtration of the sample must serve as the filtered blank. This filtered blank must be analyzed using procedures identical to those used for analysis of the samples and must meet the following criteria: DOC <0.5mg/L.

b. Ultraviolet Absorption at 254 nm (UV_{254}). Method 5910 B or 5910 B-00 (Ultraviolet Absorption Method) or EPA Method 415.3 Revision 1.1. UV absorption must be measured at 253.7 nm (may be rounded off to 254 nm). Prior to analysis, UV_{254} samples must be filtered through a 0.45 μm pore-diameter filter. The pH of UV_{254} samples may not be adjusted. Samples must be analyzed as soon as practical after sampling, not to exceed 48 hours.

5. pH. All methods allowed in Appendix A § 403-A (A) for measuring pH.

6. Magnesium. All methods allowed in Appendix A-403-A (A)(1.)

Appendix F
CONSUMER CONFIDENCE REPORT

Regulated Contaminants

Contaminant (units)	Traditional MCL mg/L	To convert for CCR, multiply by..	MCL in CCR units	MCLG	Major Sources in Drinking Water	Health Effects Language
Microbiological Contaminants						
Total Coliform Bacteria	MCL: (systems that collect ≥40 samples/month) 5% of monthly samples are positive; (systems that collect <40 samples/month) 1 positive monthly sample.		MCL: (systems that collect ≥40 samples/month) 5% of monthly samples are positive; (systems that collect <40 samples/month) 1 positive monthly sample.	0	Naturally present in the environment.	Coliforms are bacteria that are naturally present in the environment and are used as a indicator that other, potentially-harmful, bacteria may be present. Coliforms were found in more samples than allowed and this was a warning of potential problems.
Fecal Coliform and E.coli	0		0	0	Human and animal fecal waste	Fecal coliforms and E. coli are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely compromised immune systems.
Fecal Indicators (enterococci or coliphage)	TT		TT	N/A	Human and animal fecal waste.	Fecal indicators are microbes whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term health effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely compromised immune systems.
Total organic					Naturally present in	Total organic carbon (TOC) has no health effects.

carbon (ppm)	TT		TT	N/A	the environment.	However, total organic carbon provides a medium for the formation of disinfection by products. These byproducts include trihalomethanes (THMs) and haloacetic acids (HAAs). Drinking water containing these by products in excess of the MCL may lead to adverse health effects, liver or kidney problems or nervous system effects, and may lead to an increased risk of getting cancer.
Turbidity (NTU)	TT			N/A	Soil runoff.	Turbidity has no health effects. However, turbidity can interfere with disinfection and provide a medium for microbial growth. Turbidity may indicate the presence of disease-causing organisms. These organisms include bacteria, viruses, and parasites that can cause symptoms such as nausea, cramps, diarrhea and associated headaches.
Radioactive Contaminants						
Beta/photon emitters (mrem/year)	4 mrem/year		4	0	Decay of natural and man-made deposits.	Certain minerals are radioactive and may emit forms of radiation known as photons and beta radiation. Some people who drink water containing beta and photon emitters in excess of the MCL over many years may have an increased risk of getting cancer.
Alpha emitters (pCi/l)	15 pCi/l		15	0	Erosion of natural deposits.	Certain minerals are radioactive and may emit a form of radiation known as alpha radiation. Some people who drink water containing alpha emitters in excess of the MCL over many years may have an increased risk of getting cancer.
Combined radium (pCi/l)	5 pCi/l		5	0	Erosion of natural deposits.	Some people who drink water containing radium 226 or 228 in excess of the MCL over many years may have an increase risk of getting cancer.
Uranium	30μg/L		30	0	Erosion of natural deposits	Some people who drink water containing uranium in excess of the MCL over many years may have an increased risk of getting cancer and kidney toxicity.
Inorganic Contaminants						
Antimony (ppb)	0.006	1000	6	6	Discharge from petroleum refineries; fire retardants; ceramics; electronics, solder.	Some people who drink water containing antimony well in excess of the MCL over many years could experience increases in blood cholesterol and decreases in blood sugar.

Arsenic (ppb)	[1]0.010	1000	[1]10	[1]0	Erosion of natural deposits; runoff from orchards; runoff from glass and electronics production wastes.	Some people who drink water containing arsenic in excess of the MCL over many years could experience skin damage or problems with their circulatory system, and may have in increased risk of getting cancer.
Asbestos (MFL)	7 MFL		7	7	Decay of asbestos cement water mains; erosion of natural deposits.	Some people who drink water containing asbestos in excess of the MCL over many years may have an increased risk of developing benign intestinal polyps.
Barium (ppm)	2		2	2	Discharge of drilling wastes; discharge from metal refineries; erosion of natural deposits.	Some people who drink water containing barium in excess of the MCL over many years could experience an increase in their blood pressure.
Beryllium (ppb)	0.004	1000	4	4	Discharge from metal refineries and coal-burning factories; discharge from electrical, aerospace, and defense industries.	Some people who drink water containing beryllium well in excess of the MCL over many years could develop intestinal lesions.
Bromate (ppb)	0.01	1000	10	0	By-product of drinking water chlorination.	Some people who drink water containing bromate in excess of the MCL over many years may have an increased risk of getting cancer.
Cadmium (ppb)	0.005	1000	5	5	Corrosion of galvanized pipes; erosion of natural deposits; discharge from metal refineries; runoff from waste batteries and paints.	Some people who drink water containing cadmium in excess of the MCL over many years could experience kidney damage.
Chloramines (ppm)	MRDL = 4		MRDL = 4	MRDL G =4	Water additive used to control microbes	Some people who use water containing chloramines well in excess of the MRDL could experience irritating effects to their eyes and nose. Some people who drink water containing chloramines well in excess of the MRDL could experience stomach discomfort or anemia.
Chlorine (ppm)	MRDL =4		MRDL = 4	MRDL G =4	Water additive used to control microbes	Some people who use water containing chlorine well in excess of the MRDL could experience irritating effects to their eyes and nose. Some people who drink water containing chlorine well in excess of the MRDL could experience stomach

						discomfort.
Chlorite (ppm)	1		1	0.8	By-product of drinking water chlorination.	Some infants and young children who drink water containing chlorite in excess of the MCL could experience nervous system effects. Similar effects may occur in fetuses of pregnant women who drink water containing chlorite in excess of the MCL. Some people may experience anemia.
Chloride dioxide (ppb)	MRDL = 0.8	1000	MRDL =800	MRDL G = 800	Water additive used to control microbes.	Some infants and young children who drink water containing chlorine dioxide in excess of the MRDL could experience nervous system effects. Similar effects may occur in fetuses of pregnant women who drink water containing chlorine dioxide in excess of the MRDL. Some people may experience anemia.
Chromium (ppb)	0.1	1000	100	100	Discharge from steel and pulp mills; erosion of natural deposits.	Some people who use water containing chromium well in excess of the MCL over many years could experience allergic dermatitis.
Copper (ppm)	AL=1.3		AL=1.3	1.3	Corrosion of household plumbing systems; erosion of natural deposits;. Leaching from wood preservatives.	Copper is an essential nutrient, but some people who drink water containing copper in excess of the action level over a relatively short amount of time could experience gastrointestinal distress. Some people who drink water containing copper in excess of the action level over many years could suffer liver or kidney damage. People with Wilson's Disease should consult their personal doctor.
Cyanide (ppb)	0.2	1000	200	200	Discharge from steel/metal factories; discharge from plastic and fertilizer factories.	Some people who drink water containing cyanide well in excess of the MCL over many years could experience nerve damage or problems with their thyroid.
Fluoride (ppm)	4		4	4	Erosion of natural deposits; water additive which promotes strong teeth; discharge from fertilizer and aluminum factories.	Some people who drink water containing fluoride in excess of the MCL over many years could get bone disease, including pain and tenderness of the bones. Fluoride in drinking water at half of the MCL or more may cause mottling of children's teeth, usually in children less than nine years old. Mottling, also known as dental fluorosis, may include brown staining and/or pitting of the teeth, and occurs only in developing teeth before they erupt from the gums.

Lead (ppb)	AL=0.015	1000	AL=15	0	Corrosion of household plumbing systems; erosion of natural deposits.	Infants and children who drink water containing lead in excess of the action level could experience delays in their physical or mental development. Children could show slight deficits in attention span and learning abilities. Adults who drink this water over many years could develop kidney problems or high blood pressure.
Mercury [inorganic] (ppb)	0.002	1000	2	2	Erosion of natural deposits; discharge from refineries and factories; runoff from landfills; runoff from cropland.	Some people who drink water containing inorganic mercury well in excess of the MCL over many years could experience kidney damage.
Nitrate (ppm)	10		10	10	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits.	Infants below the age of six months who drink water containing nitrate in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue baby syndrome.
Nitrite (ppm)	1		1	1	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits.	Infants below the age of six months who drink water containing nitrite in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue baby syndrome.
Selenium (ppb)	0.05	1000	50	50	Discharge from petroleum and metal refineries; erosion of natural deposits; discharge from mines.	Selenium is an essential nutrient. However, some people who drink water containing selenium in excess of the MCL over many years could experience hair or fingernail losses, numbness in fingers or toes, or problems with their circulation.
Thallium (ppb)	0.002	1000	2	0.5	Leaching from ore-processing sites; discharge from electronic, glass and drug factories.	Some people who drink water containing thallium in excess of the MCL over many years could experience hair loss, changes in their blood, or problems with their kidneys, intestines, or liver.
Synthetic Organic contaminants including Pesticides and Herbacides						
2,4-D (ppb)	0.07	1000	70	70	Runoff from herbicide used on row crops.	Some people who drink water containing the weed killer 2,4-D well in excess of the MCL over many years could experience problems with their kidneys, liver, or adrenal glands.

2,4,5-TP [Silvex] (ppb)	0.05	1000	50	50	Residue of banned herbicide.	Some people who drink water containing silvex in excess of the MCL over many years could experience liver problems.
Acrylamide	TT		TT	0	Added to water during sewage/wastewater treatment.	Some people who drink water containing high levels of acrylamide over a long period of time could have problems with their nervous system or blood, and may have an increased risk of getting cancer.
Alachlor (ppb)	0.002	1000	2	0	Runoff from herbicide used on row crops.	Some people who drink water containing alachlor in excess of the MCL over many years could have problems with their eyes, liver, kidneys or spleen, or experience anemia, and may have an increased risk of getting cancer.
Atrazine (ppb)	0.003	1000	3	3	Runoff from herbicide used on row crops.	Some people who drink water containing atrazine well in excess of the MCL over many years could experience problems with their cardiovascular system or reproductive difficulties.
Benzo(a)pyrene [PAH] (nanograms/l)	0.0002	1,000,000	200	0	Leaching from linings of water storage tanks and distribution lines.	Some people who drink water containing benzo(a)pyrene in excess of the MCL over many years may experience reproductive difficulties and may have an increased risk of getting cancer.
Carbofuran (ppb)	0.04	1000	40	40	Leaching of soil fumigant used on rice and alfalfa.	Some people who drink water containing carbofuran in excess of the MCL over many years could experience problems with their blood, or nervous or reproductive systems.
Chlordane (ppb)	0.002	1000	2	0	Residue of banned termiticide	Some people who drink water containing chlordane in excess of the MCL over many years could experience problems with their liver or nervous system, and may have an increased risk of getting cancer.
Dalapon (ppb)	0.2	1000	200	200	Runoff from herbicide used on rights of way.	Some people who drink water containing dalapon well in excess of the MCL over many years could experience minor kidney changes.
Di(2-ethylhexyl)adipate (ppb)	0.4	1000	400	400	Discharge from chemical factories.	Some people who drink water containing di(2-ethylhexyl)adipate in excess of the MCL over many years could experience general toxic effects such as weight loss, liver enlargement, or possible reproductive difficulties.
Di(2-ethylhexyl)phthalate (ppb)	0.006	1000	6	0	Discharge from rubber and chemical factories.	Some people who drink water containing di(2-ethylhexyl)phthalate in excess of the MCL over many years may have problems with their

						liver, or experience reproductive difficulties and may have an increased risk of getting cancer.
Dibromochloropropane (ppt)	0.0002	1,000,000	200	0	Runoff/leaching from soil fumigant used on soybeans, cotton, pineapples, and orchards.	Some people who drink water containing DBCP in excess of the MCL over many years could experience reproductive problems and may have an increased risk of getting cancer.
Dinoseb (ppb)	0.007	1000	7	7	Runoff from herbicide used on soybeans and vegetables.	Some people who drink water containing dinoseb well in excess of the MCL over many years could experience reproductive difficulties.
Diquat (ppb)	0.02	1000	20	20	Runoff from herbicide use.	Some people who drink water containing diquat in excess of the MCL over many years could get cataracts.
Dioxin [2,3,7,8-TCDD] (ppq)	0.00000003	1,000,000,000	30	0	Emissions from waste incineration and other combustion; discharge from chemical factories.	Some people who drink water containing dioxin in excess of the MCL over many years could experience difficulties and may have an increased risk of getting cancer.
Endothall (ppb)	0.1	1000	100	100	Runoff from herbicide use.	Some people who drink water containing endothall in excess of the MCL over many years could experience problems with their stomach or intestines.
Endrin (ppb)	0.002	1000	2	2	Residue of banned insecticide.	Some people who drink water containing endrin in excess of the MCL over many years could experience liver problems.
Epichlorohydrin	TT		TT	0	Discharge from industrial chemical factories; an impurity of some water treatment chemicals.	Some people who drink water containing high levels of epichlorohydrin over a long period of time could experience stomach problems, and may have an increased risk of getting cancer.
Ethylene dibromide (ppt)	0.00005	1,000,000	50	0	Discharge from petroleum refineries.	Some people who drink water containing ethylene dibromide in excess of the MCL over many years could experience problems with their liver, stomach, reproductive system, or kidneys, and may have an increased risk of getting cancer.
Glyphosate (ppb)	0.7	1000	700	700	Runoff from herbicide use.	Some people who drink water containing glyphosate in excess of the MCL over many years could experience problems with their kidneys or reproductive difficulties.

Heptachlor (ppt)	0.0004	1,000,000	400	0	Residue of banned pesticide.	Some people who drink water containing heptachlor in excess of the MCL over many years could experience liver damage and may have an increase risk of getting cancer.
Heptachlor epoxide (ppt)	0.0002	1,000,000	200	0	Breakdown of heptachlor.	Some people who drink water containing heptachlor epoxide in excess of the MCL over many years could experience liver damage, and may have an increased risk of getting cancer.
Hexachlorobenzene (ppb)	0.001	1000	1	0	Discharge from metal refineries and agricultural chemical factories.	Some people who drink water containing hexachlorobenzene in excess of the MCL over many years could experience problems with their liver or kidneys, or adverse reproductive effects, and may have an increased risk of getting cancer.
Hexachlorocyclopenta-diene (ppb)	0.05	1000	50	50	Discharge from chemical factories.	Some people who drink water containing hexachlorocyclopentadiene well in excess of the MCL over many years could experience problems with their kidneys or stomach.
Lindane (ppt)	0.0002	1,000,000	200	200	Runoff/leaching from insecticide used on cattle, lumber, gardens.	Some people who drink water containing lindane in excess of the MCL over many years could experience problems with their kidneys or liver.
Methoxychlor (ppb)	0.04	1000	40	40	Runoff/leaching from insecticide used on fruits, vegetables, alfalfa, livestock.	Some people who drink water containing methoxychlor in excess of the MCL over many years could experience reproductive difficulties.
Oxamyl [Vydate] (ppb)	0.2	1000	200	200	Runoff/leaching from insecticide used on apples, potatoes and tomatoes.	Some people who drink water containing oxamyl in excess of the MCL over many years could experience slight nervous system effects.
PCB [Polychlorinated bi-phenyls] (ppt)	0.0005	1,000,000	500	0	Runoff from landfills; discharge of waste chemicals	Some people who drink water containing PCBs in excess of the MCL over many years could experience changes in their skin problems with their thymus gland, immune deficiencies, or reproductive or nervous system difficulties, and may have an increased risk of getting cancer.
Pentachlorophenol (ppb)	0.001	1000	1	0	Discharge from wood preserving factories.	Some people who drink water containing pentachlorophenol in excess of the MCL over many years could experience problems with their liver or kidneys, and may have an increased risk of getting cancer.
Picloram (ppb)	0.5	1000	500	500	Herbicide runoff	Some people who drink water containing picloram

						in excess of the MCL over many years could experience problems with their liver.
Simazine (ppb)	0.004	1000	4	4	Herbicide runoff	Some people who drink water containing simazine in excess of the MCL over many years could experience problems with their blood.
Toxaphene (ppb)	0.003	1000	3	0	Runoff/leaching from insecticide used in cotton and cattle.	Some people who drink water containing toxaphene in excess of the MCL over many years could have problems with their kidneys, liver, or thyroid, and may have an increased risk of getting cancer.
Volatile organic contaminants:						
Benzene (ppb)	0.005	1000	5	0	Discharge from factories; Leaching from gas storage tanks and landfills.	Some people who drink water containing benzene in excess of the MCL over many years could experience anemia or a decrease in blood platelets, and may have an increase risk of getting cancer.
Carbon tetrachloride (ppb)	0.005	1000	5	0	Discharge from chemical plants and other industrial activities	Some people who drink water containing carbon tetrachloride in excess of the MCL over many years could experience problems with their liver and may have an increased risk of getting cancer.
Chlorobenzene (ppb)	0.10	1000	100	100	Discharge from chemical and agricultural chemical factories.	Some people who drink water containing chlorobenzene in excess of the MCL over many years could experience problems with their liver or kidneys.
o-Dichlorobenzene (ppb)	0.60	1000	600	600	Discharge from industrial chemical factories.	Some people who drink water containing o-dichlorobenzene well in excess of the MCL over many years could experience problems with their liver, kidneys or circulatory systems.
p-Dichlorobenzene (ppb)	0.075	1000	75	75	Discharge from industrial chemical factories.	Some people who drink water containing p-dichlorobenzene well in excess of the MCL over many years could experience problems with their liver, kidneys, or circulatory sytems.
1,2-Dichloroethane (ppb)	0.005	1000	5	0	Discharge from industrial chemical factories.	Some people who drink water containing 1,2-dichloroethane in excess of the MCL over many years may have an increased risk of getting cancer.
1,1-Dichloroethylene (ppb)	0.007	1000	7	7	Discharge from industrial chemical factories.	Some people who drink water containing 1,1-dichloroethylene in excess of the MCL over many years could experience problems with their liver.

cis-1,2,-Dichloroethylene (ppb)	0.07	1000	70	70	Discharge from industrial chemical factories.	Some people who drink water containing cis-1,2-dichloroethylene in excess of the MCL over many years could experience problems with their liver.
trans-1,2-Dichloroethylene (ppb)	0.10	1000	100	100	Discharge from industrial chemical factories.	Some people who drink water containing trans-1,2-dichloroethylene well in excess of the MCL over many years could experience problems with their liver.
Dichloromethane (ppb)	0.005	1000	5	0	Discharge from pharmaceutical and chemical factories.	Some people who drink water containing dichloromethane in excess of the MCL over many years could have liver problems and may have an increased risk of getting cancer.
1,2-Dichloropropane (ppb)	0.005	1000	5	0	Discharge from industrial chemical factories.	Some people who drink water containing 1,2-dichloropropane in excess of the MCL over many years may have an increased risk of getting cancer.
Ethylbenzene (ppb)	0.7	1000	700	700	Discharge from petroleum refineries.	Some people who drink water containing ethylbenzene well in excess of the MCL over many years could experience problems with their liver or kidneys.
Haloacetic Acids (HAA) (ppb)	0.06	1000	60	N/A	By-product of drinking water disinfection.	Some people who drink water containing haloacetic acids in excess of the MCL over many years may have an increase risk of getting cancer.
Styrene (ppb)	0.1	1000	100	100	Discharge from rubber and plastic factories; leaching from landfills.	Some people who drink water containing styrene well in excess of the MCL over many years could have problems with their liver, kidneys, or circulatory system.
Tetrachloroethylene (ppb)	0.005	1000	5	0	Discharge from factories and dry cleaners.	Some people who drink water containing tetrachlorotheylene in excess of the MCL over many years could have problems with their liver, and may have an increased risk of getting cancer.
1,2,4-Trichlorobenzene (ppb)	0.07	1000	70	70	Discharge from textile-finishing factories.	Some people who drink water containing 1,2,4-trichlorobenzene well in excess of the MCL over many years could experience changes in their adrenal glands.
1,1,1,-Trichloroethane (ppb)	0.2	1000	200	200	Discharge from metal degreasing sites and other factories.	Some people who drink water containing 1,1,1-trichloroethane in excess of the MCL over many years could experience problems with their liver, nervous system, or circulatory system.

1,1,2-Trichloroethane (ppb)	0.005	1000	5	3	Discharge from industrial chemical factories.	Some people who drink water containing 1,1,2-trichloroethane well in excess of the MCL over many years could have problems with their liver, kidneys or immune systems.
Trichloroethylene (ppb)	0.005	1000	5	0	Discharge from metal degreasing sites and other factories.	Some people who drink water containing trichloroethylene in excess of the MCL over many years could experience problems with their liver and may have an increased risk of getting cancer.
TTHMs [Total trihalomethanes] (ppb)	0.10/0.08	1000	100/80	N/A	By-product of drinking water chlorination.	Some people who drink water containing trihalomethanes in excess of the MCL over many years may experience problems with their liver, kidneys or central nervous systems, and may have an increased risk of getting cancer.
Toluene (ppm)	1		1	1	Discharge from petroleum factories.	Some people who drink water containing toluene well in excess of the MCL over many years could have problems with their nervous system, kidneys or liver.
Vinyl Chloride (ppb)	0.002	1000	2	0	Leaching from PVC piping; discharge from plastics factories.	Some people who drink water containing vinyl chloride in excess of the MCL over many years may have an increased risk of getting cancer.
Xylenes (ppm)	10		10	10	Discharge from petroleum factories; discharge from chemical factories.	Some people who drink water containing xylenes in excess of the MCL over many years could experience damage to their nervous system.
Radioactive Contaminants:						
Beta/photon emitters (mrem/yr)	4 mrem/yr		4	0	Decay of natural and man-made deposits.	Certain minerals are radioactive and may emit forms of radiation known as photons and beta radiation. Some people who drink water containing beta particle and photon radioactivity in excess of the MCL over many years may have an increased risk of getting cancer.
Alpha emitters (pCi/L)	15 pCi/L		15	0	Erosion of natural deposits.	Certain minerals are radioactive and may emit forms of radiation known as alpha radiation. Some people who drink water containing alpha emitters in excess of the MCL over many years may have an increased risk of getting cancer.
Combined radium (pCi/L)	5 pCi/L		5	0	Erosion of natural deposits.	Some people who drink water containing radium-226 or -228 in excess of the MCL over many years may have an increased risk of getting

						cancer.
Uranium (μg/L)	30 μg/L		30	0	Erosion of natural deposits.	Some people who drink water containing uranium in excess of the MCL over many years may have an increased risk of getting cancer and kidney toxicity.

[1] These arsenic values are effective January 23, 2006. Until then, the MCL is 0.05 mg/L and there is no MCLG.

Key	
AL	Action Level
MCL	Maximum Contaminant Level
MCLG	Maximum Contaminant Level Goal
MFL	Million fibers per liter
MRDL	Maximum Residual Disinfectant Level
MRDLG	Maximum Residual Disinfectant Level Goal
mrem/year	Millirems per year (a measure of radiation absorbed by the body)
N/A	Not Applicable
NTU	Nephelometric Turbidity (a measure of water clarity)
pCI/L	Picocuries per liter (a measure radioactivity)
ppm	Parts per million or milligrams per liter (mg/L)
ppb	Parts per billion or micrograms per liter (μg/L)
ppt	Parts per trillion or nanograms per liter
ppq	Parts per quadrillion or picograms per liter
TT	Treatment Technique

APPENDIX G
ENHANCED TREATMENT FOR *CRYPTOSPORIDIUM*

2401-G

A. ANALYTICAL METHODS

1. CRYPTOSPORIDIUM Systems must analyze for Cryptosporidium using *Method 1623: Cryptosporidium and Giardia in Water by Filtration/IMS/FA, 2005*, United States Environmental Protection Agency, EPA-815-R-05-002 or *Method 1622: Cryptosporidium in Water by Filtration/IMS/FA, 2005*, United States Environmental Protection Agency, EPA-815-R-05-001, which are incorporated by reference. You may obtain a copy of these methods online from *http://www.epa.gov/safewater/disinfection/lt2* or from the United States Environmental Protection Agency, Office of Ground Water and Drinking Water, 1201 Constitution Ave., NW, Washington, DC 20460 (Telephone: 800-426-4791). You may inspect a copy at the Water Docket in the EPA Docket Center, 1301 Constitution Ave., NW, Washington, DC, (Telephone: 202-566-2426) or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202-741-6030, or go to: http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html.

   a Systems must analyze at least a 10 L sample or a packed pellet volume of at least 2 mL as generated by the methods listed in paragraph (A) of this section. Systems unable to process a 10 L sample must analyze as much sample volume as can be filtered by two filters approved by EPA for the methods listed in paragraph (A) of this section, up to a packed pellet volume of at least 2 mL.

   b
      1. Matrix spike (MS) samples, as required by the methods in paragraph (A) of this section, must be spiked and filtered by a laboratory approved for Cryptosporidium analysis under §2406.

      2. If the volume of the MS sample is greater than 10 L, the system may filter all but 10 L of the MS sample in the field, and ship the filtered sample and the remaining 10 L of source water to the laboratory. In this case, the laboratory must spike the remaining 10 L of water and filter it through the filter used to collect the balance of the sample in the field.

   c Flow cytometer-counted spiking suspensions must be used for MS samples and ongoing precision and recovery (OPR) samples.

2. **E. COLI.** Systems must use methods for enumeration of E. coli in source water approved in 40 CFR §136.3(a) of this title.

   a The time from sample collection to initiation of analysis may not exceed 30 hours unless the system meets the condition of paragraph (B)(2) of this section.

   b The Director may approve on a case-by-case basis the holding of an E. coli sample for up to 48 hours between sample collection and initiation of analysis if the Director determines that analyzing an E. coli sample within 30 hours is not feasible. E. coli samples held between 30 to 48 hours must be analyzed by the Colilert reagent version of Standard Method 9223B as listed in 40 CFR §136.3(a) of this title.

3. Systems must maintain samples between 0°C and 10°C during storage and transit to the laboratory.

4. **TURBIDITY.** Systems must use methods for turbidity measurement approved in Appendix D - 800-D (A)(1).

2402-G

A. **Approved laboratories.**

1. Cryptosporidium. Systems must have Cryptosporidium samples analyzed by a laboratory that is approved under EPA's Laboratory Quality Assurance Evaluation Program for Analysis of Cryptosporidium in Water or a laboratory that has been certified for Cryptosporidium analysis by an equivalent State laboratory certification program.

2. E. coli. Any laboratory certified by the EPA, the National Environmental Laboratory

Accreditation Conference or the State for total coliform or fecal coliform analysis under Appendix D - 800-D is approved for E. coli analysis under this subpart when the laboratory uses the same technique for E. coli that the laboratory uses for Appendix D - 800-D.

3. Turbidity. Measurements of turbidity must be made by a party approved by the Director.

2403 - G

A. **E. coli sample analysis.**

1. The analysis of E. coli samples must meet the analytical method and approved laboratory requirements of Appendix G -2401 - G through 2402 - G.

2404 -G

A. **Cryptosporidium sample analysis.** The analysis of Cryptosporidium samples must meet the criteria in this paragraph.

1. Laboratories analyzed Cryptosporidium samples using one of the analytical methods in paragraphs (C)(1)(a) through (f) of this section, which are incorporated by reference. You may obtain a copy of these methods on-line from the United States Environmental Protection Agency, Office of Ground Water and Drinking Water, 1201 Constitution Ave, NW, Washington, DC 20460 (Telephone: 800-426-4791). You may inspect a copy at the Water Docket in the EPA Docket Center, 1301 Constitution Ave., NW, Washington, DC, (Telephone: 202-566-2426) or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202-741-6030, or go to: http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html.

a *Method 1623: Cryptosporidium and Giardia in Water by Filtration/IMS/FA, 2005*, United States Environmental Protection Agency, EPA-815-R-05-002.

b *Method 1622: Cryptosporidium in Water by Filtration/IMS/FA, 2005*, United States Environmental Protection Agency, EPA-815-R-05-001.

c *Method 1623: Cryptosporidium and Giardia in Water by Filtration/IMS/FA, 2001*, United States Environmental Protection Agency, EPA-821-R-01-025.

d *Method 1622: Cryptosporidium in Water by Filtration/IMS/FA, 2001*, United States Environmental Protection Agency, EPA-821-R-01-026.

e *Method 1623: Cryptosporidium and Giardia in Water by Filtration/IMS/FA, 1999*, United States Environmental Protection Agency, EPA-821-R-99-006.

f *Method 1622: Cryptosporidium in Water by Filtration/IMS/FA, 1999*, United States Environmental Protection Agency, EPA-821-R-99-001.

2. For each Cryptosporidium sample, the laboratory analyzed at least 10 L of sample or at least 2 mL of packed pellet or as much volume as could be filtered by 2 filters that EPA approved for the methods listed in paragraph (C)(1) of this section.

APPENDIX H
GROUNDWATER ANALYTICAL METHODS

2501-A GROUNDWATER SOURCE MICROBIAL MONITORING AND ANALYTICAL METHODS

A. A groundwater system subject to the source water monitoring requirements of must collect a standard sample volume of at least 100 mL for fecal indicator analysis regardless of the fecal indicator or analytical method used.

B. A groundwater system must analyze all ground water source samples using one of the analytical methods listed in the following table for the presence of E. coli, enterococci, or coliphage:

Table 2501-A-1 ANALYTICAL METHODS FOR SOURCE WATER MONITORING

Fecal Indicator[1]	Methodology	Method Citation
E.coli	Colilert[3] Colisure[3] Membrane Filter Method with MI Agar m-ColiBlue24 Test [5] E*Colite Test[6] EC-MUG[7] NA-MUG[7]	9223B.[2] 9223B.[2] EPA Method 1604.[4] 9221F.[2] 9222G.[2]
Enterococci	Multiple-Tube Technique	9230B.[2]
Coliphage	Two-Step Enrichment Presence-Absence Proce	EPA Method 1601.[10] EPA Method 1602.[11]

Analyses must be conducted in accordance with the documents listed below. Copies of the documents may be obtained from the sources listed below. Copies may be inspected in EPA's Drinking Water Docket, EPA West, 1301 Constitution Avenue, NW., EPA West, Room B102, Washington DC 20460 (Telephone: 202-566-2426); or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202-741-6030, or go to:
http://www.archives.gov/federal register/code of federal regulations/ibr locations.html.

[1] The time from sample collection to initiation of analysis may not exceed 30 hours. The ground water system is encouraged but is not required to hold samples below 10°C during transit.
[2] Methods are described in Standard Methods for the Examination of Water and Wastewater 20th edition (1998) and copies may be obtained from the American Public Health Association, 1015 Fifteenth Street, NW., Washington, DC, 20005-2605.
[3] Medium is available through IDEXX Laboratories, Inc., One IDEXX Drive, Westbrook, Maine 04092.
[4] EPA Method 1604: Total Coliforms and Escherichia coli in Water by Membrane Filtration Using a Simultaneous Detection Technique (MI Medium); September 2002, EPA 821-R-02-024. Method is available at http://www.epa.gov/nerlcwww/1604sp02.pdf or EPA's Water Resource Center (RC-4100T), 1200 Pennsylvania Avenue, NW., Washington, DC 20460.
[5] A description of the mColiBlue24 Test, "Total Coliforms and E.coli Membrane Filtration Method with m-ColiBlue24® Broth," Method No. 10029 Revision 2, August 17, 1999, is available from Hach Company, 100 Dayton Ave., Ames, IA 50010 or from EPA's Water Resource Center (RC-4100T), 1200 Pennsylvania Avenue, NW., Washington, DC 20460.
[6] A description of the E*Colite Test, "Charm E*Colite Presence/Absence Test for Detection and Identification of Coliform Bacteria and Escherichia coli in Drinking Water, January 9, 1998, is available from Charm Sciences, Inc., 659 Andover St., Lawrence, MA 01843-1032 or from EPA's Water Resource Center (RC-4100T), 1200 Pennsylvania Avenue, NW., Washington, DC 20460.
[7] EC-MUG(Method 9221F) or NA-MUG (9222G) can be used for E.coli testing step as described in §141.21(F)(6)(i) or (ii) after use of Standard Methods 9221 B, 9222 B, or 9222 C.
[8] EPA Method 1600: Enterococci in Water by Membrane Filtration Using membrane-Enterococcus Indoxyl-β-D-Glucoside Agar (mEI) EPA 821-R-02-022 (September 2002) is an approved variation of Standard Method 9230C. The method is available at http://www.epa.gov/nerlcwww/1600so02.pdf or from EPA's Water Resource Center (RC-4100T), 1200 Pennsylvania Avenue, NW., Washington, DC 20460. The holding time and temperature for ground water samples are specified in footnote 1 above, rather than as specified in Section 8 of EPA Method 1600.
[9] Medium is available through IDEXX Laboratories, Inc., One IDEXX Drive, Westbrook, Maine 04092. Preparation and use of the medium is set forth in the article "Evaluation of Enterolert for Enumeration of Enterococci in Recreational Waters," by Budnick, G.E., Howard, R.T., and Mayo, D.R., 1996, Applied and Environmental Microbiology, 62:3881-3884.

[10] EPA Method 1601: Male-specific (F+) and Somatic Coliphage in Water by Two-step Enrichment Procedure; April 2001, EPA 821-R-01-030. Method is available at http://www.epa.gov/nerlcwww/1601ap01.pdf or from EPA's Water Resource Center (RC-4100T), 1200 Pennsylvania Avenue, NW., Washington, DC 20460.

[11] EPA Method 1602: Male-specific (+) and Somatic Coliphage in Water by Single Agar Layer (SAL) Procedure; April 2001, EPA 821-R-01-029. Method is available at http://www.epa.gov/nerlcwww/1601ap01.pdf or from EPA's Water Resource Center (RC-4100T), 1200 Pennsylvania Avenue, NW., Washington, DC 20460.

The Navajo Nation
Window Rock, Arizona 86515

SECTION 164 REVIEW PROCESS

No:27720

Dept. Surface/Ground Water Protection Name Yolanda Barney Phone No. 871-7755/7715

DOCUMENT:

REVIEW and FORMAL ADOPTION by the Resources and Development Committee of the Navajo Nation Council: Proposed Navajo Nation Primary Drinking Water Regulations amendments to prepare the regulations for primacy of the sanitary survey provisions, lead and copper provisions, consumer confidence report provisions, enhanced surface water treatment provisions, operator certification provisions, enhanced filtration and disinfection provisions, stage 2-disinfection by-products provisions, groundwater provisions, and the appendices (A, B, D, E, G, and H). Primacy states (including the Navajo Nation Public Water Systems Supervision Program) are required to amend the regulations and submit primacy applications for each regulation pursuant to 40 CFR 142.12. The Navajo Public Water Systems Supervision Program is seeking formal adoption by the Resources and Development Committee of these amendments.

REVIEWERS

1. Sponsor/Program : _____ Date: 2-14-13
2. Division : _____ Date: 2/25/13
3. Office of Management & Budget : _____ Date: _____
4. Office of the Controller : _____ Date: _____
5. Office of Attorney General : _____ Date: 1/6/14
6. Office of the President : _____ Date: 1/10/15
7. Legislative Counsel : _____ Date: _____
8. Committee Chairperson : _____ Date: _____

CONTRACTS/AGREEMENTS/GRANTS: RETURN ENTIRE DOCUMENTS TO O.M.B. FOR ADMINISTRATIVE IMPLEMENTATION.

Business Regulatory Dept., DED: _____ Date: _____

COMMENTS:

WHITE - OPVP CANARY - OCG PINK - CONTROLLER GOLDENROD - [illegible] DIV.