Appendix A

Primacy Revision Crosswalks

The Primacy revision crosswalk for the Stage 1 Disinfectants/Disinfection Byproducts Rule (Stage 1 DBPR) is presented on the following pages and includes the amendments published on January 16, 2001. Regulatory language which was amended on January 16, 2001 appears underlined in the following table.

Under 40 CFR 142.12, states must adopt the requirements of the Stage 1 DBPR within 2 years of the final rule's publication, or by December 16, 2000. While states may find it easier to combine the amendments to the Stage 1 DBPR with the original Stage 1 DBPR, the amendments must be adopted within 2 years their publication or by January 16, 2003.

Please note there have been many changes to the Public Notice (PN) and Consumer Confidence Report (CCR) rules since the publication of Stage 1 DBPR. Additional information on these changes is available at www.epa.gov/safewater/pn.html and www.epa.gov/safewater/ccr1.html.

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PRIMACY REVISION CROSSWALK FOR THE STAGE 1 DBPR

FEDERAL REQUIREMENT	FEDERAL CITATION	STATE CITATION (DOCUMENT TITLE, PAGE NUMBER, SECTION/PARAGRAPH)	DIFFERENT FROM FED. REQUIREMENT? EXPLAIN ON SEPARATE SHEET
SUBPART A—GENERAL			
§ 141.2 DEFINITIONS			
Enhanced coagulation	§ 141.2		
Enhanced softening	§ 141.2		
GAC 10	§ 141.2		
Haloacetic acids (five) (HAA5)	§ 141.2		
Maximum Residual Disinfectant Level (MRDL)	§ 141.2		
Maximum Residual Disinfectant Level Goal (MRDLG)	§ 141.2		
Subpart H Systems	§ 141.2		
Specific Ultraviolet Absorption (SUVA)	§ 141.2		
Total Organic Carbon (TOC)	§ 141.2		
SUBPART B—MAXIMUM CONTAMINANT LEVELS			
§ 141.12 MAXIMUM CONTAMINANT LEVELS FOR TOTAL TRIHALOMETHANES			
Maximum contaminant level for TTHM applies to Subpart H CWSs that serve 10,000 or more people until December 31, 2001; level applies to ground water CWSs that serve 10,000 or more people until December 31, 2003.	§ 141.12		
SUBPART C—MONITORING AND ANALYTICAL REQUIREMENTS			
§ 141.30 TOTAL TRIHALOMETHANES SAMPLING, ANALYTICAL AND OTHER REQUIREMENTS			
Compliance with §141.12 shall be based on running annual average of quarterly samples collected by the systems as prescribed in (b)(1) or (2)	§ 141.30(d)		

FEDERAL REQUIREMENT	FEDERAL CITATION	STATE CITATION (DOCUMENT TITLE, PAGE NUMBER, SECTION/PARAGRAPH)	DIFFERENT FROM FED. REQUIREMENT? EXPLAIN ON SEPARATE SHEET
Sampling and analysis made pursuant to this section shall be conducted by one of the total trihalomethanes methods as directed in § 141.24(e), and the Technical Notes on Drinking Water Methods, EPA-600/R-94-173, October 1994	§ 141.30(e)		
Before a CWS makes any significant modifications to its existing treatment process for the purposes of achieving compliance with §141.12 the systems must submit and obtain state approval of a detailed plan setting forth its proposed modification and those safeguards that it will implement to ensure that the bateriological quality of the drinking water served by the system will not be adversely affected by the modification	§ 141.30(f)		
Requirements in (a) through (g) apply to Subpart H CWSs that serve 10,000 or more people until December 31, 2001; requirements in (a) through (g) apply to ground water CWSs that use a disinfectant and serve 10,000 or more people until December 31, 2003.	§ 141.30(h)		
SUBPART D & SUBPART Q—REPORTING, PUBLIC NOTIFICATION AND RECORDKEEPING NOTE: If the revised PN rule, published on May 4, 2000 (65 FR 25981), has already been adopted, the state is not required to adopt §141.32(e)(10). The revised PN rule supercedes §141.32. If the revised PN rule has not been adopted, the state must satisfy §141.32(e)(10).			
§ 141.32 PUBLIC NOTIFICATION			
For violations of the MCLs of contaminants and MRDLs of disinfectants that may pose an acute risk to human health, by furnishing a copy of the notice to radio and television stations serving the area served by the PWS as soon as possible but in no case later than 72 hours after the violation	§ 141.32(a)(1)(iii)		
Violation of the MRDL for chlorine dioxide as defined in §141.65 and determined according to §141.133(c)(2)	§ 141.32(a)(1)(iii)(e)		
Owner/operator of CWS must give copy of the most recent public notice for any outstanding violation of any MCL, any MRDL, or any treatment technique requirement, or any variance or exemption to all new billing units or new hookups prior to or at the time service begins	§ 141.32(c)		
Chlorine public notification language	§ 141.32(e)(76)		

FEDERAL REQUIREMENT	FEDERAL CITATION	STATE CITATION (DOCUMENT TITLE, PAGE NUMBER, SECTION/PARAGRAPH)	DIFFERENT FROM FED. REQUIREMENT? EXPLAIN ON SEPARATE SHEET
Chloramines public notification language	§ 141.32(e)(77)		
Chlorine Dioxide public notification language	§ 141.32(e)(78)		
Chlorine Dioxide Nonacute Violations public notification language	§141.32(e)(78)(i)		
Chlorine Dioxide Acute Violations public notification language	§141.32(e)(78)(ii)		
Disinfection Byproducts and Treatment Technique for DBPs public notification language	§ 141.32(e)(79)		
Bromate public notification language	§ 141.32(e)(80)		
Chlorite public notification language	§ 141.32(e)(81)		
SUBPART F—MAXIMUM CONTAMINANT LEVEL GOALS AND MAXIMUM RESIDUAL DISINFECTANT LEVEL GOALS[1]			
§ 141.53 MAXIMUM CONTAMINANT LEVEL GOALS FOR DISINFECTION BYPRODUCTS			
Bromodichloromethane: zero Bromoform: zero Bromate: zero Dichloroacetic acid: zero Trichloroacetic acid: 0.3 mg/L Chlorite: 0.8 mg/L Dibromochloromethane: 0.06 mg/L	§ 141.53		
§ 141.54 MAXIMUM RESIDUAL DISINFECTANT LEVEL GOALS FOR DISINFECTANTS			
Chlorine: 4 mg/L (as Cl_2) Chloramines: 4 mg/L (as Cl_2) Chlorine dioxide: 0.8 mg/L (as ClO_2)	§ 141.54		

[1]States need not have corresponding MCLGs and MRDLs.

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SUBPART G—MAXIMUM CONTAMINANT LEVELS AND MAXIMUM RESIDUAL DISINFECTANT LEVELS			
§ 141.64 MAXIMUM CONTAMINANT LEVELS FOR DISINFECTION BYPRODUCTS			
Total trihalomethanes: 0.080 mg/L Haloacetic acids (five): 0.060 mg/L Bromate: 0.010 mg/L Chlorite: 1.0 mg/L	§ 141.64(a)		
Subpart H systems serving 10,000 or more people must comply with this section beginning January 1, 2002; Subpart H systems serving fewer than 10,000 people and ground water systems must comply with this section beginning January 1, 2004	§ 141.64(b)(1)		
System installing GAC or membranes may apply to state for extension of up to 24 months past the compliance dates but not beyond December 31, 2003; state must set a schedule for compliance and may specify interim measures that the system must take; failure to meet the schedule or the interim requirements constitutes a violation of the NPDWRs	§ 141.64(b)(2)		
BATs for TTHMs, HAA5, Bromate, Chlorite	§ 141.64(c)		
§ 141.65 MAXIMUM RESIDUAL DISINFECTANT LEVELS			
Chlorine: 4.0 mg/L (as Cl_2) Chloramines: 4.0 mg/L (as Cl_2) Chlorine Dioxide: 0.8 mg/L (as ClO_2)	§ 141.65(a)		
CWSs and NTNCWSs: Subpart H systems serving 10,000 or more people must comply with this section beginning January 1, 2002; Subpart H systems serving fewer than 10,000 people and ground water systems must comply with this section beginning January 1, 2004	§ 141.65(b)(1)		

FEDERAL REQUIREMENT	FEDERAL CITATION	STATE CITATION (DOCUMENT TITLE, PAGE NUMBER, SECTION/PARAGRAPH)	DIFFERENT FROM FED. REQUIREMENT? EXPLAIN ON SEPARATE SHEET
TNCWSs: Subpart H systems using chlorine dioxide and serving 10,000 or more people must comply with the MRDL beginning January 1, 2002; Subpart H systems serving fewer than 10,000 people and using chlorine dioxide must comply with the chlorine dioxide MRDL beginning January 1, 2004	§ 141.65(b)(2)		
BATs for MRDLs	§ 141.65(c)		
SUBPART L—DISINFECTANT RESIDUALS, DISINFECTION BYPRODUCTS, AND DISINFECTION BYPRODUCT PRECURSORS			
§ 141.130 GENERAL REQUIREMENTS			
Requirements are NPDWR	§ 141.130(a)		
Regulations establish criteria under which CWSs and NTNCWSs which add a disinfectant to their water in any part of the treatment process must modify their practices to meet the MCLs and MRDLs in §141.64 and §141.65 and must meet treatment technique requirements for DBP precursors in §141.135	§ 141.130(a)(1)		
Regulations establish criteria under which transient NCWSs that use chlorine dioxide must modify their practices to meet the MRDL for chlorine dioxide in §141.65	§ 141.130(a)(2)		
EPA has established MCLs for TTHM and HAA5 and treatment technique requirements for DBP precursors	§ 141.130(a)(3)		
CWSs and NTNCWSs: Subpart H systems serving 10,000 or more people must comply with this subpart beginning January 1, 2002; Subpart H systems serving fewer than 10,000 persons and ground water systems must comply with this subpart beginning January 1, 2004	§ 141.130(b)(1)		
TNCWs Subpart H systems serving 10,000 or more people and using chlorine dioxide must comply with this subpart beginning January 1, 2002; Subpart H systems serving fewer than 10,000 people and ground water systems using chlorine dioxide must comply with this subpart beginning January 1, 2004	§ 141.130(b)(2)		

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CWSs and NTNCWSs must be operated by qualified personnel who meet the requirements specified by the state and are included in a state register of qualified operators	§ 141.130(c)		
Systems may increase residual disinfectant levels in the distribution system for 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	§ 141.130(d)		
§ 141.131 ANALYTICAL REQUIREMENTS			
System must only use analytical method(s) specified in this section or approved by EPA to demonstrate compliance; methods are effective February 16, 1999	§ 141.131(a)(1)		
Documents containing analytical methods are incorporated by reference	§ 141.131(a)(2)		
Systems must measure DBPs by the methods listed in (b)(1)	§ 141.131(b)(1)		
Analysis for DBPs must be conducted by EPA or state-certified labs; labs must analyze PE samples annually for certification; lab must achieve a 95% confidence interval 80% of the time to remain certified	§ 141.131(b)(2)		
EPA or state approved party must measure daily chlorite samples at the entrance to the distribution system	§ 141.131(b)(3)		
Systems must measure residual disinfectant concentrations for free chlorine, combined chlorine, and chlorine dioxide by the methods listed in (c)(1)	§ 141.131(c)(1)		
System may also measure residual disinfectant concentrations using DPD colorimetric test kits if approved by the state	§ 141.131(c)(2)		
Party approved by EPA or the state must measure residual disinfectant concentrations	§ 141.131(c)(3)		
Systems required to analyze additional parameters must use the specified methods; party approved by the state or EPA must measure the parameters	§ 141.131(d)		

FEDERAL REQUIREMENT	FEDERAL CITATION	STATE CITATION (DOCUMENT TITLE, PAGE NUMBER, SECTION/PARAGRAPH)	DIFFERENT FROM FED. REQUIREMENT? EXPLAIN ON SEPARATE SHEET
Methods for measuring alkalinity	§ 141.131(d)(1)		
Methods for measuring bromide	§ 141.131(d)(2)		
Methods for measuring TOC	§ 141.131(d)(3)		
Methods for measuring SUVA	§ 141.131(d)(4)		
Methods for measuring DOC	§ 141.131(d)(4)(i)		
Methods for measuring UV_{254}	§ 141.131(d)(4)(ii)		
Methods for measuring pH	§ 141.131(d)(5)		
§ 141.132 MONITORING REQUIREMENTS			
Systems must take all samples during normal operating conditions	§ 141.132(a)(1)		
System 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 in (h) with state approval	§ 141.132(a)(2)		
Failure to monitor in accordance with the monitoring plan is a monitoring violation	§ 141.132(a)(3)		
Failure to monitor will be treated as a violation for the entire period covered by an annual average where compliance is based on an annual average of monthly or quarterly samples or averages and a system's failure to monitor makes it impossible to determine MCL/MRDL compliance	§ 141.132(a)(4)		
Systems may use only data collected under the provisions of this subpart or Subpart M to qualify for reduced monitoring	§ 141.132(a)(5)		
Routine monitoring requirements for TTHM and HAA5	§ 141.132(b)(1)(i)		
Reduced monitoring requirements for TTHM and HAA5	§ 141.132(b)(1)(ii)		

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System on a reduced monitoring schedule may remain on that schedule as long as annual average of all samples taken in the year or the result of the sample is no more than 0.060mg/L for TTHM and 0.045 mg/L for HAA5; systems that do not meet these levels must resume monitoring at the frequency identified in (b)(1)(i) in the quarter immediately following the monitoring period of the exceedance. For systems using only ground water not under the direct influence of surface water and serving fewer than 10,000 persons, if either theTTHM annual average is >0.080 mg/l or the HAA5 annual average is >0.060 mg/L, the system must go to increased monitoring at the frequency identified in (b)(1)(i) in the quarter immediately following the monitoring period of the exceedance.	§ 141.132(b)(1)(iii)		
Systems on increased monitoring may return to routine monitoring if TTHM annual average is #0.060 mg/L and HAA5 annual average is #0.045 mg/L	§ 141.132(b)(1)(iv)		
State may return a system to routine monitoring at the state's discretion	§ 141.132(b)(1)(v)		
Routine daily monitoring requirements for chlorite	§ 141.132(b)(2)(i)(A)		
Routine monthly monitoring requirements for chlorite	§ 141.132(b)(2)(i)(B)		
Additional monitoring requirements for chlorite	§ 141.132(b)(2)(ii)		
No reduced daily monitoring for chlorite	§ 141.132(b)(2)(iii)(A)		
Reduced monitoring in distribution system for chlorite	§ 141.132(b)(2)(iii)(B)		
Routine monitoring requirements for bromate	§ 141.132(b)(3)(i)		
Reduced monitoring requirements for bromate	§ 141.132(b)(3)(ii)		
Routine monitoring requirements for chlorine and chloramines	§ 141.132(c)(1)(i)		
No reduced monitoring for chlorine and chloramines	§ 141.132(c)(1)(ii)		
Routine monitoring requirements for chlorine dioxide	§ 141.132(c)(2)(i)		

FEDERAL REQUIREMENT	FEDERAL CITATION	STATE CITATION (DOCUMENT TITLE, PAGE NUMBER, SECTION/PARAGRAPH)	DIFFERENT FROM FED. REQUIREMENT? EXPLAIN ON SEPARATE SHEET
Additional monitoring requirements for chlorine dioxide	§ 141.132(c)(2)(ii)		
No reduced monitoring for chlorine dioxide	§ 141.132(c)(2)(iii)		
Routine monitoring requirements for DBP precursors	§ 141.132(d)(1)		
Reduced monitoring requirements for DBP precursors	§ 141.132(d)(2)		
Monitoring requirements for bromide, to remain on reduced bromate monitoring	§ 141.132(e)		
Each system required to monitor must develop and implement a monitoring plan; system must maintain the plan and make it available to the state and the general public no later than 30 days following applicable compliance dates; Subpart H systems serving more than 3,300 must submit a copy of the monitoring plan to the state no later than the date of the first report required under §141.134; state may require any system to submit its monitoring plan; state may require changes in any plan element	§ 141.132(f)		
Monitoring plan: locations and schedules for collecting samples for any parameters	§ 141.132(f)(1)		
Monitoring plan: how system will calculate compliance with MCL, MRDLs, treatment techniques	§ 141.132(f)(2)		
Monitoring plan: sampling plan must reflect the entire distribution system if approved for monitoring as a consecutive system or if providing water to a consecutive system	§ 141.132(f)(3)		
§141.133 COMPLIANCE REQUIREMENTS			
System fails to monitor that makes it impossible to determine compliance with the MCLs or MRDLs will be treated as a violation for entire period covered by an annual average	§ 141.133(a)(1)		
All samples taken and analyzed under this subpart must be included in determining compliance even if the number is greater than the minimum required	§ 141.133(a)(2)		

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If, during the first year of monitoring, any individual quarter's average will cause the annual average of that system to exceed the MCL the system is out of compliance at end of that quarter	§ 141.133(a)(3)		
Compliance requirements for TTHM and HAA5 MCLs for systems monitoring quarterly	§ 141.133(b)(1)(i)		
Compliance requirements for TTHM and HAA5 MCLs for systems monitoring less than quarterly; system must increase monitoring to once per quarter if MCL exceeded	§ 141.133(b)(1)(ii)		
Compliance requirements for TTHM and HAA5 MCLs, if running annual arithmetic average of quarterly averages covering any four-quarter period exceeds the MCL, the system is in violation of the MCL.	§ 141.133(b)(1)(iii)		
Compliance requirements for TTHM and HAA5 MCLs, if a PWS fails to complete four consecutive quarters of monitoring, compliance with the MCL for the last four-quarters compliance period must be based on an average of the available data.	§ 141.133(b)(1)(iv)		
Compliance requirements for bromate	§ 141.133(b)(2)		
Compliance requirements for chlorite	§ 141.133(b)(3)		
Compliance requirements for chlorine and chloramines; if the MRDL is exceeded the system must notify the public and report to the state	§ 141.133(c)(1)(i)		
Compliance requirements for systems switching between the use of chlorine and chloramines	§ 141.133(c)(1)(ii)		
Compliance requirements for chlorine dioxide acute violations	§ 141.133(c)(2)(i)		
Compliance requirements for chlorine dioxide nonacute violations	§ 141.133(c)(2)(ii)		
Compliance requirements for DBP precursors	§ 141.133(d)		

FEDERAL REQUIREMENT	FEDERAL CITATION	STATE CITATION (DOCUMENT TITLE, PAGE NUMBER, SECTION/PARAGRAPH)	DIFFERENT FROM FED. REQUIREMENT? EXPLAIN ON SEPARATE SHEET
§ 141.134 REPORTING AND RECORDKEEPING REQUIREMENTS			
Systems required to sample at least quarterly must report to the state within 10 days after the end of each quarter in which samples were collected; systems required to sample less frequently than quarterly must report to the state within 10 days after the end of each monitoring period in which samples were collected	§ 141.134(a)		
Reporting Requirements for DBPs	§ 141.134(b)		
Reporting Requirements for TTHM and HAA5	§ 141.134(b)		
Reporting Requirements for Chlorite	§ 141.134(b)		
Reporting Requirements for Bromate	§ 141.134(b)		
Reporting Requirements for Disinfectants	§ 141.134(c)		
Reporting Requirements for Chlorine and Chloramines	§ 141.134(c)		
Reporting Requirements for Chlorine Dioxide	§ 141.134(c)		
Reporting Requirements for DBP precursors	§ 141.134(d)		
§ 141.135 TREATMENT TECHNIQUE FOR CONTROL OF DBP PRECURSORS			
Subpart H systems using conventional filtration (as defined in §141.2) must operate with enhanced coagulation or enhanced softening to achieve the TOC percent removal levels specified in (b) unless the system meets at least one of alternative compliance criteria in (a)(2) or (a)(3)	§ 141.135(a)(1)		
Subpart H systems using conventional filtration treatment may use alternative compliance criteria to comply with this section; systems must still comply with the monitoring requirements in §141.132(d)	§ 141.135(a)(2)		
Alternative compliance criterion: source water running annual average TOC < 2.0 mg/L	§ 141.135(a)(2)(i)		
Alternative compliance criterion: treated water running annual average TOC < 2.0 mg/L	§ 141.135(a)(2)(ii)		

FEDERAL REQUIREMENT	FEDERAL CITATION	STATE CITATION (DOCUMENT TITLE, PAGE NUMBER, SECTION/PARAGRAPH)	DIFFERENT FROM FED. REQUIREMENT? EXPLAIN ON SEPARATE SHEET
Alternative compliance criterion: source water running annual average TOC < 4.0 mg/L; alkalinity > 60 mg/L; TTHM # 0.040 mg/L and HAA5 # 0.030 mg/L or system has made a clear and irrevocable financial commitment to use technologies that will limit the levels of TTHMs and HAA5s	§ 141.135(a)(2)(iii)		
Alternative compliance criterion: running annual average TTHM < 0.040 mg/L and annual average HAA5 < 0.030 mg/L; system uses only chlorine for primary disinfection and maintenance of a residual in the distribution system	§ 141.135(a)(2)(iv)		
Alternative compliance criterion: source water SUVA # 2.0 L/mg-m	§ 141.135(a)(2)(v)		
Alternative compliance criterion: finished water SUVA # 2.0 L/mg-m	§ 141.135(a)(2)(vi)		
Systems practicing enhanced softening that cannot achieve TOC removals in (b)(2) may use alternative compliance criteria; system must still comply with monitoring requirements in §141.132(d)	§ 141.135(a)(3)		
Alternative compliance criterion: softening that results in lowering treated water running annual average alkalinity to < 60 mg/L (as $CaCO_3$)	§ 141.135(a)(3)(i)		
Alternative compliance criterion: softening that results in removing running annual average of at least 10 mg/L magnesium hardness (as $CaCO_3$)	§ 141.135(a)(3)(ii)		
Systems must achieve the percent reductions of TOC specified in (b)(2) between the raw water source and CFE unless the state approves a system's request for alternative minimum TOC (Step 2) requirements under (b)(3)	§ 141.135(b)(1)		
Required TOC (Step 1) reductions are based on specified source water parameters; systems that use enhanced softening must meet the percent removal requirements for alkalinity > 120 mg/L for specified source water TOC	§ 141.135(b)(2)		
Subpart H systems that cannot achieve the TOC removals in (b)(2) must apply to state within 3 months of failure to achieve the removals for the approval of alternative minimum TOC removal requirements	§ 141.135(b)(3)		

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Applications to the state for alternative minimum TOC removals under (b)(3) must include the results of bench- or pilot-scale testing under (b)(4)(i) used to determine an alternate enhanced coagulation level	§ 141.135(b)(4)		
Definition of alternate enhanced coagulation level	§ 141.135(b)(4)(i)		
Requirements for bench- or pilot-scale testing	§ 141.135(b)(4)(ii)		
Requirements for waters with alkalinities < 60 mg/L for which small amounts of alum or equivalent addition of iron coagulant drive the pH below 5.5 before significant TOC removal occurs	§ 141.135(b)(4)(iii)		
System may operate at any coagulant dose of pH necessary (consistent with other NPDWRs) to achieve the minimum TOC percent removal approved in (b)(3)	§ 141.135(b)(4)(iv)		
System may apply to the state for a waiver of enhanced coagulation requirements if water is deemed non-amenable to enhanced coagulation (if the TOC removal is consistently less than 0.3 mg/L of TOC per 10mg/L of incremental alum dose at all dosages of alum, the water is deemed to contain TOC not amenable to enhanced coagulation)	§ 141.135(b)(4)(v)		
Systems must calculate compliance quarterly beginning after the system has collected 12 months of data	§ 141.135(c)(1)		
Determine actual monthly TOC percent removal	§ 141.135(c)(1)(i)		
Determine required monthly TOC percent removal from (b)(2) or (b)(3)	§ 141.135(c)(1)(ii)		
Divide value from (c)(1)(i) by value from (c)(1)(ii)	§ 141.135(c)(1)(iii)		
Add results for (c)(1)(iii) for last 12 months and divide by 12	§ 141.135(c)(1)(iv)		
If value from (c)(1)(iv) < 1.00 the system is not in compliance with the TOC percent removal requirements	§ 141.135(c)(1)(v)		
Systems may use provisions in (c)(2)(i) through (v) in lieu of the calculations in (c)(1)(i) through (v) to determine compliance with TOC percent removal requirements	§ 141.135(c)(2)		

FEDERAL REQUIREMENT	FEDERAL CITATION	STATE CITATION (DOCUMENT TITLE, PAGE NUMBER, SECTION/PARAGRAPH)	DIFFERENT FROM FED. REQUIREMENT? EXPLAIN ON SEPARATE SHEET
If in any month treated or source water TOC < 2.0 mg/L the system may assign a monthly value of 1.0	§ 141.135(c)(2)(i)		
In any month the system practicing softening removed at least 10 mg/L of magnesium hardness (as $CaCO_3$) the system may assign a monthly value of 1.0	§ 141.135(c)(2)(ii)		
In any month source water SUVA prior to treatment # 2.0 L/mg-m the system may assign a monthly value of 1.0	§ 141.135(c)(2)(iii)		
In any month finished water SUVA prior to treatment # 2.0 L/mg-m the system may assign a monthly value of 1.0	§ 141.135(c)(2)(iv)		
In any month a system practicing enhanced softening lowers alkalinity below 60 mg/L (as $CaCO_3$) the system may assign a monthly value of 1.0	§ 141.135(c)(2)(v)		
Subpart H systems using conventional treatment may also comply with the requirements of this section by meeting the criteria in (a)(2) or (3)	§ 141.135(c)(3)		
Agency identifies treatment techniques for DBP precursors: enhanced coagulation or enhanced softening	§ 141.135(d)		
SUBPART O—CONSUMER CONFIDENCE REPORTS NOTE: If the CCR rule has not been adopted, is it not expected that the Subpart O provision will be adopted with the IESWTR			
§ 141.154 REQUIRED ADDITIONAL HEALTH INFORMATION			
CWSs that detect TTHM above 0.080 mg/L but below the MCL in §141.12 as an annual average monitored and calculated under §141.30 must include health effects language prescribed by paragraph (73) of Appendix C to Subpart O	§ 141.154(e)		

PRIMACY REVISION CROSSWALK FOR THE STAGE 1 DBPR		
Federal Requirement	**Federal Citation**	**Explanation of State Policies and Procedures**
SUBPART B—PRIMARY ENFORCEMENT RESPONSIBILITY		
§ 142.14 RECORDS KEPT BY STATES		
Records of currently applicable or most recent state determinations; explanation of technical basis for each decision; interim measures toward installation	§ 142.14(d)(12)	
States must keep records of systems installing GAC or membrane technology; date by which system is required to have completed installation	§ 142.14(d)(12)(i)	
State must keep records of systems that are required to meet alternative minimum TOC removal requirements or for whom state has determined that source water is not amenable to enhanced coagulation; alternative limits and rationale for establishing alternative limits	§ 142.14(d)(12)(ii)	
States must keep records of Subpart H systems using conventional treatment meeting any of the alternative compliance criteria in §141.135(a)(2) or (3)	§ 142.14(d)(12)(iii)	
States must keep a register of qualified operators that have met state requirements under §141.16(f)(2)	§ 142.14(d)(12)(iv)	
Records of systems with multiple wells considered to be 1 treatment plant	§ 142.14(d)(13)	
Monitoring plans for Subpart H systems serving more than 3,300 people	§ 142.14(d)(14)	
List of laboratories approved for analyses	§ 142.14(d)(15)	
List of systems required to monitor for disinfectants and DBPs; indicate what disinfectants and DBPs (other than chlorine, TTHM, and HAA5) are measured	§ 142.14(d)(16)	
§ 142.16 SPECIAL PRIMACY REQUIREMENTS		
Requirements for states to adopt 40 CFR part 141, Subpart L (state regs must be at least as stringent)	§ 142.16(h)	
Application must contain description of how state will accomplish program requirements	§ 142.16(h)	
Program requirement: determine any interim treatment requirements for systems electing to install GAC or membranes and are granted additional time to comply with §141.64 (state does not have to respond if it utilizes authority under § 1412(b)(10) to extend schedule)	§ 142.16(h)(1)	

Federal Requirement	Federal Citation	Explanation of State Policies and Procedures
Program requirement: qualify operators of PWSs	§ 142.16(h)(2)	
Program requirement: approve DPD colorimetric test kits for free and total chlorine measurements	§ 142.16(h)(3)	
Program requirement: approve parties to conduct pH, bromide, alkalinity, and residual disinfectant concentration measurements	§ 142.16(h)(4)	
Program requirement: define criteria to use to determine if multiple wells are being drawn from a single aquifer and may be considered a single source for compliance with monitoring requirements.	§ 142.16(h)(5)	
Program requirement: approve alternative TOC (Step 2) removal levels allowed under §141.135(b)	§ 142.16(h)(6)	

Appendix B

Sample Extension Agreement

Under 40 CFR 142.12, states must adopt the requirements of the Stage 1 Disinfectants/Disinfection Byproducts Rule (Stage 1 DBPR) within 2 years of the final rules' publication or by December 16, 2000.

An extension agreement will be necessary **only** when states have not submitted a complete and final primacy revision application package by December 16, 2000. For further detail, please refer to Section III B.

A sample extension agreement is presented on the following pages.

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Extension Agreement

Name of State Agency
U.S. Environmental Protection Agency Region ____
Extension Agreement
for Implementation of the
Stage 1 Disinfectants/Disinfection Byproducts Rule (Stage 1 DBPR)

On December 16, 1998, the U.S. Environmental Protection Agency (EPA) published the final Stage 1 Disinfectants/Disinfection Byproducts Rule (Stage 1 DBPR). This rule amends the National Primary Drinking Water Regulations, 40 CFR Part 141 and the regulations for implementation of the National Primary Drinking Water Regulations, 40 CFR Part 142. Provisions of this rule take effect 36 to 60 months after publication.

The April 28, 1998 revisions to the Primacy Rule extend the time allowed for States to adopt new Federal regulations from 18 months to 2 years. Therefore, the State must adopt regulations pertaining to the Stage 1 DBPR and submit a complete and final primacy revision application by December 16, 2000 unless it requests an extension of up to 2 years to adopt the new or revised regulations.

This document records the terms of a Primacy Extension Agreement between the (**Name of State Agency**) (the State) and the EPA, Region ____ for the Stage 1 Disinfectants/Disinfection Byproducts Rule, and shall remain effective from the date (for State's eligible for interim primacy) this extension agreement is signed until either December 16, 2002 or the date the State's primacy application is submitted under 40 C.F.R. §142.12. To retain primacy the State must submit a final and approvable Primacy Revision Application incorporating the above-referenced provisions of the Federal Register to EPA, Region ____ by December 16, 2000, or no later than December 16, 2002, if the State has been granted an extension.

Until the State Primacy Revision Application has been submitted, for States eligible for interim primacy, or approved, the State and EPA, Region ____ will share responsibility for implementing the primary program elements as indicated below.

This Extension Agreement outlines the responsibilities of (**Name of State Agency**) and EPA, Region ____ as partners in this effort, working toward two very specific public health-related goals. The first goal is to achieve a high level of compliance with the regulation. The second goal is to facilitate successful implementation of the regulation during the transition period before the State has interim primacy for the rule. In order to accomplish these goals, education and training will need to be provided to water suppliers on their responsibilities under the Stage 1 DBPR.

Activities to be carried out by the State or Region:

- Notify PWSs within 60 days of signing this extension agreement of the requirements of the Stage 1 DBPR;
- Identify other State agencies that should receive copies of the Stage 1 DBPR. Within 60 days of signing this extension agreement, provide EPA Region with the names, addresses, and phone numbers of contacts identified within those agencies;
- Train State staff and PWSs on the requirements of the Stage 1 DBPR;
- Devise a tracking system for PWSs' monitoring and reporting performed pursuant to the Stage 1 DBPR;
- Issue notices to PWSs that fail to meet requirements of the Stage 1 DBPR;
- Provide copies of the Stage 1 DBPR in response to public inquiries;
- Report Stage 1 DBPR violation and enforcement information to SDWIS as required;
- Coordinate with water associations to increase awareness of requirements;
- Assist with public outreach efforts to inform and educate PWSs;
- Prepare guidance as needed, or forward national guidance to the States;
- Keep States informed of SDWIS reporting requirements during development and implementation;
- Compliance assistance; and,
- Notify States of all Federal enforcement actions.

This Extension Agreement will take effect upon the date of the last signature.

Dated this_____day of _____, 2000

_____

Agency Director or Secretary

_____

Name of State Agency

Dated this_____day of _____, 2000

_____

Regional Administrator
EPA, Region_____

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Appendix C

Statement of Principles—Guidance on Audit Law Issues

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

FEB 14 1997

MEMORANDUM

SUBJECT: Statement of Principles
Effect of State Audit Immunity/Privilege Laws
On Enforcement Authority for Federal Programs

TO: Regional Administrators

FROM: Steven A. Herman
Assistant Administrator, OECA

Robert Perciasepe
Assistant Administrator, OPPE

Mary Nichols
Assistant Administrator, OAR

Timothy Fields
Acting Assistant Administrator, OSWER

Under federal law, states must have adequate authority to enforce the requirements of any federal programs they are authorized to administer. Some state audit immunity/privilege laws place restrictions on the ability of states to obtain penalties and injunctive relief for violations of federal program requirements, or to obtain information that may be needed to determine compliance status. This statement of principles reflects EPA's orientation to approving new state programs or program modifications in the face of state audit laws that restrict state enforcement and information gathering authority. While such state laws may raise questions about other federal program requirements, this statement is limited to the question of when enforcement and information gathering authority may be considered adequate for the purpose of approving or delegating programs in states with audit privilege or immunity laws.

I. Audit Immunity Laws

Federal law and regulation requires states to have authority to obtain injunctive relief, and civil and criminal penalties for any violation of program requirements. In determining whether to authorize or approve a program or program modification in a state with an audit immunity law, EPA must consider whether the state's enforcement authority meets federal program requirements. To maintain such authority while at the same time providing incentives for self-policing in appropriate circumstances, states should rely on policies rather than enact statutory immunities for any violations. However, in determining whether these requirements are met in states with laws pertaining to voluntary auditing, EPA will be particularly concerned, among other factors, with whether the state has the ability to:

1) Obtain immediate and complete injunctive relief;

2) Recover civil penalties for:

i) significant economic benefit;

ii) repeat violations and violations of judicial or administrative orders;

iii) serious harm;

iv) activities that may present imminent & substantial endangerment.

3) Obtain criminal fines/sanctions for wilful and knowing violations of federal law, and in addition for violations that result from gross negligence under the Clean Water Act.

The presumption is that each of these authorities must be present at a minimum before the state's enforcement authority may be considered adequate. However, other factors in the statute may eliminate or so narrow the scope of penalty immunity to the point where EPA's concerns are met. For example:

1) The immunity provided by the statute may be limited to minor violations and contain other restrictions that sharply limit its applicability to federal programs.

2) The statute may include explicit provisions that make it inapplicable to federal programs.

II. Audit Privilege Laws

Adequate civil and criminal enforcement authority means that the state must have the ability to obtain information needed to identify noncompliance and criminal conduct. In

determining whether to authorize or approve a program or program modification in a state with an audit privilege law, EPA expects the state to:

1) retain information gathering authority it is required to have under the specific requirements of regulations governing authorized or delegated programs;

2) avoid making the privilege applicable to criminal investigations, grand jury proceedings, and prosecutions, or exempt evidence of criminal conduct from the scope of privilege;

3) preserve the right of the public to obtain information about noncompliance, report violations and bring enforcement actions for violations of federal environmental law. For example, sanctions for whistleblowers or state laws that prevent citizens from obtaining information about noncompliance to which they are entitled under federal law appear to be inconsistent with this requirement.

III. Applicability of Principles

It is important for EPA to clearly communicate its position to states and to interpret the requirements for enforcement authority consistently. Accordingly, these principles will be applied in reviewing whether enforcement authority is adequate under the following programs:

1) National Pollutant Discharge Elimination System (NPDES), Pretreatment and Wetlands programs under the Clean Water Act;

2) Public Water Supply Systems and Underground Injection Control programs under the Safe Drinking Water Act;

3) Hazardous Waste (Subtitle C) and Underground Storage Tank (Subtitle I) programs under the Resource Conservation Recovery Act;

4) Title V, New Source Performance Standards, National Emission Standards for Hazardous Air Pollutants, and New Source Review Programs under the Clean Air Act.

These principles are subject to three important qualifications:

1) While these principles will be consistently applied in reviewing state enforcement authority under federal programs, state laws vary in their detail. It will be important to scrutinize the provisions of such statutes closely in determining whether enforcement authority is provided.

2) Many provisions of state law may be ambiguous, and it will generally be important to obtain an opinion from the state Attorney General regarding the meaning of the state law

and the effect of the state's law on its enforcement authority as it is outlined in these principles. Depending on its conclusions, EPA may determine that the Attorney General's opinion is sufficient to establish that the state has the required enforcement authority.

3) These principles are broadly applicable to the requirements for penalty and information gathering authority for each of the programs cited above. To the extent that different or more specific requirements for enforcement authority may be found in federal law or regulations, EPA will take these into account in conducting its review of state programs. In addition, this memorandum does not address other issues that could be raised by state audit laws, such as the scope of public participation or the availability to the public of information within the state's possession.

IV. Next Steps

Regional offices should, in consultation with OECA and national program offices, develop a state-by-state plan to work with states to remedy any problems identified pursuant to application of these principles. As a first step, regions should contact state attorneys general for an opinion regarding the effect of any audit privilege or immunity law on enforcement authority as discussed in these principles.

Appendix D

Stage 1 DBPR Plain English Summary

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United States
Environmental Protection
Agency

Office of Water
(4606)

EPA 816-R-01-014
June 2001

The Stage 1 Disinfectants and Disinfection Byproducts Rule

What Does it Mean to You?

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Contents

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Definitions and Abbreviations

Definitions

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.

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.

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.

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).

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.

Abbreviations Used in This Document

BAT: Best Available Technology

CDC: Centers for Disease Control and Prevention

CWS: Community Water System

DBP: Disinfection Byproducts

DBPP: Disinfection Byproducts Precursors

EC: Enhanced Coagulation

EPA: United States Environmental Protection Agency

ES: Enhanced Softening

ESWTR: Enhanced Surface Water Treatment Rule

FACA: Federal Advisory Committee Act

FR: Federal Register

GAC10: Granular Activated Carbon with ten minute empty bed contact time and 180 day reactivation frequency

GWR: Ground Water Rule

GWUDI: Ground Water Under the Direct Influence of Surface Water

HAA5: Haloacetic Acids (five)(chloroacetic acid, dichloroacetic acid, trichloroacetic acid, bromoacetic acid and dibromoacetic acid)

ICR: Information Collection Rule (issued under section 1412(b) of the SDWA)

IESWTR: Interim Enhanced Surface Water Treatment Rule

Log Inactivation: Logarithm of (N_0/N_T)

Log: Logarithm (common, base 10)
LT1ESTWR: Long-Term 1 Enhanced Surface Water Treatment Rule
LT2ESWTR: Long-Term 2 Enhanced Surface Water Treatment Rule
MCL: Maximum Contaminant Level
MCLG: Maximum Contaminant Level Goal
M–DBP: Microbial and Disinfectants/Disinfection Byproducts
mg/L: Milligrams per Liter
MR: Monitoring/Reporting
MRDL: Maximum Residual Disinfectant Level
MRDLG: Maximum Residual Disinfectant Level Goal
NIPDWR: National Interim Primary Drinking Water Regulation
NSCEP: National Service for Environmental Publications
NTIS: National Technical Information Service
NTNCWS: Non-Transient Non-Community Water System
PWS: Public Water System
PWSS: Public Water Supply Supervision Program
Reg. Neg.: Regulatory Negotiation
SDWA: Safe Drinking Water Act, or the ''Act,'' as amended 1996
SDWIS: Safe Drinking Water Information System
Subpart H: PWS using surface water or ground water under the direct influence of surface water
SUVA: Specific Ultraviolet Absorbance
SWTR: Surface Water Treatment Rule
TCR: Total Coliform Rule
TNCWS: Transient Non-Community Water Systems
TOC: Total Organic Carbon
TTHM: Total Trihalomethanes (chloroform, bromdichloromethane, dibromochloromethane, and bromoform)

1. Introduction

Purpose of the Guide

The purpose of this guide is to detail the regulatory requirements of the Stage 1 Disinfectants/Disinfection Byproducts Rule (Stage 1 DBPR). The Stage 1 DBPR, published in the Federal Register on December 16, 1998 (63 FR 69390; www.epa.gov/OGWDW/mdbp/dbpfr.html; 66 FR 3770; www.epa.gov/safewater/mdbp/iesfr.html), is the first part of a series of rules, the "Microbial-Disinfectants/Disinfection Byproducts Cluster" (M-DBP Cluster), to be published over the next several years that are intended to control microbial pathogens while minimizing the public health risks of disinfectants and disinfection byproducts (DBPs). The Stage 1 DBPR specifically addresses risks associated with disinfectants and DBPs. This rule was published concurrently with the Interim Enhanced Surface Water Treatment Rule (IESWTR), which addresses control of microbial pathogens.

Background

The 1974 Safe Drinking Water Act (SDWA) called for EPA to regulate drinking water by creating the national interim primary drinking water regulations (NIPDWR). In 1979, the first interim standard addressing DBPs was set for total trihalomethanes (TTHMs), a group of four volatile organic chemicals which form when disinfectants react with natural organic matter in the water.

Although SDWA was amended slightly in 1977, 1979, and 1980, the most significant changes to the 1974 law occurred when SDWA was reauthorized in 1986. Disease-causing microbial contamination had not been sufficiently controlled under the original Act. To safeguard public health, the 1986 Amendments required EPA to set health goals, or maximum contaminant level goals (MCLGs) and maximum contaminant levels (MCLs) for 83 named contaminants. EPA was also required to establish regulations within certain time frames, require disinfection of all public water supplies, specify filtration requirements for nearly all water systems that draw their water from surface sources, and develop additional programs to protect ground water supplies.

In 1989, EPA issued two important National Primary Drinking Water Regulations (NPDWR): The Total Coliform Rule (TCR) and the Surface Water Treatment Rule (SWTR). The TCR and SWTR provide the foundation for the M-DBP Cluster and are summarized below.

The TCR covers all public water systems. Since coliforms are easily detected in water, they are used to indicate a water system's vulnerability to pathogens in the water. In the TCR, EPA set a MCLG of zero for total coliforms. EPA also set a MCL for total coliforms. If more than 5.0 percent of the samples contain coliforms within a month, water system operators must report this violation to the state and the public. In addition, sanitary surveys are required every five or ten years (depending on the quality of the source water) for every system that collects fewer than five samples per month (typically systems that serve less than 4,100 people).

EPA issued the SWTR in response to Congress' mandate requiring disinfection, and where necessary, filtration of systems that draw their water from surface sources before distribution. The SWTR applies to all systems that use surface water or ground water under the direct influence of surface water (GWUDI). The rule sets MCLGs for *Legionella*, *Giardia lamblia*, and viruses at zero since any exposure to these contaminants presents some level of health risk.

Specifically, the rule requires that a surface water system have sufficient treatment to reduce the source water concentration of *Giardia lamblia* and viruses by at least 99.9 percent (3 log) and 99.99 percent (4 log), respectively. A detectable disinfection residual must be maintained throughout the entire distribution system. For systems that filter, the adequacy of the filtration process is determined by measuring the turbidity of the treated water since high levels of turbidity often indicate that the filtration process is not working properly. The goal of the SWTR is to reduce risk to less than one infection per

year per 10,000 people. However, the SWTR does not account for systems with high pathogen concentrations that, when treated at the levels required under the rule, still may not meet this health goal, and the rule does not specifically control for the protozoan *Cryptosporidium*.

In 1990, EPA's Science Advisory Board, an independent panel of experts established by Congress, cited drinking water contamination as one of the most important environmental risks and indicated that disease-causing microbial contaminants (*i.e.*, bacteria, protozoa, and viruses) are probably the greatest remaining health-risk management challenge for drinking water suppliers. Data from the Centers for Disease Control (CDC) confirm this concern and indicate that between 1980 and 1994, 379 waterborne disease outbreaks were reported, with over 500,000 cases of disease. During this period, a number of agents were implicated as the cause, including protozoa, viruses, bacteria, and several chemicals. Most of the cases (but not the outbreaks) were associated with surface water, including a single outbreak of cryptosporidiosis in Milwaukee (over 400,000 cases).

In response to these findings, the SDWA was further amended in 1996 to improve public health protection by incorporating new data on the adverse health effects of contaminants, the occurrence of contaminants in public water systems, and the estimated reduction in health risks that would result from further regulation. The Act also increased scientific research requirements and emphasized cost-benefit analyses in the regulatory decision process.

Based on prevailing scientific data, the M-DBP Cluster is intended to control microbial pathogens while minimizing the public health risk from disinfectants and DBPs. Since multiple threats require multiple barriers, the IESWTR and Stage 1 DBPR expand on the foundation of the TCR, SWTR, and TTHM standards to target health risk outliers unaddressed by prior regulations.

The TTHM NPDWR of 1979 set a standard for TTHMs only for public water systems (PWSs) serving 10,000 or more people. The Stage 1 DBPR builds on the TTHM Rule by lowering the MCL and widening the range of affected systems to include all PWSs that add a disinfectant. Therefore, EPA believes that the promulgation of the Stage 1 DBPR will significantly decrease the risks posed by DBPs and disinfectants by covering many PWSs not currently regulated for TTHM or other DBPs.

Many water systems treat their water with a chemical disinfectant in order to inactivate pathogens that cause disease. The public health benefits of common disinfection practices are significant and well-recognized; however, disinfection poses risks of its own. While disinfectants are effective in controlling many harmful microorganisms, they react with organic and inorganic matter (disinfection byproduct precursors—DBPPs) in the water and form DBPs, some of which pose health risks at certain levels. Since the discovery of chlorination byproducts in drinking water in 1974, numerous toxicological studies have been conducted that show some DBPs to be carcinogenic and/or cause reproductive or developmental effects in laboratory animals. Additionally, exposure to high levels of disinfectants over long periods of time may cause health problems, including damage to blood and kidneys. While many of these studies have been conducted at high doses, the weight-of-evidence indicates that DBPs present a potential public health problem that must be addressed. One of the most complex questions facing water supply professionals is how to reduce risks from disinfectants and DBPs while providing increased protection against microbial contaminants. Much of the population is exposed to these risks; therefore, a substantial concern exists.

To address this concern, the Stage 1 DBP Rule updates and supersedes the 1979 TTHM standard by lowering the MCL for TTHMs and establishing maximum residual disinfection level (MRDL) limits for chlorine, chloramines, and chlorine dioxide and new MCLs for chlorite, bromate, and haloacetic acids (HAA5) for all community water systems and nontransient noncommunity water systems that add a chemical disinfectant for either primary or residual treatment. In addition, the Stage 1 DBP Rule requires conventional filtration systems to remove specified percentages of organic materials measured as total organic carbon (TOC) that may react with disinfectants to form DBPs.

By building on the foundation set forth by the original SDWA, the quality of drinking water has improved and public health protection has increased. The IESWTR and Stage 1 DBP Rules are part of a series of rules designed to expand on the foundation of prior rulemaking efforts. By encompassing previously unaddressed health risks from microbials and disinfection byproducts, the M-DBP Cluster continues to maximize drinking water quality and public health protection.

Development of the Rule

The new rules are a product of 6 years of collaboration among the water supply industry, environmental and public health groups, and local, state, and federal governments. EPA first launched a rule-making process in 1992 and convened a Regulatory Negotiation (RegNeg) Advisory Committee under the Federal Advisory Committee Act (FACA), representing a range of stakeholders affected by possible regulation. The 1996 SDWA Amendments required EPA to develop rules to balance the risks between microbial pathogens and disinfection byproducts.

In 1997, a similar FACA process was implemented with the Microbial-Disinfectants/Disinfection Byproducts (M-DBP) Advisory Committee. The M-DBP Committee convened to collect, share, and analyze new information available since 1994, review previous assumptions made during the RegNeg process, as well as build consensus on the regulatory implications of this new information. Negotiations resulted in the following three proposals:

- A staged approach to regulation of DBPs (referred to as the Stage 1 and Stage 2 DBPRs) incorporating Maximum Contaminant Levels (MCLs), Maximum Residual Disinfectant Levels (MRDLs), and treatment technique requirements;

- A companion Interim Enhanced Surface Water Treatment Rule (IESWTR) designed to improve control of microbial pathogens and prevent inadvertent reductions in microbial safety as a result of DBP control efforts; and,

- An Information Collection Rule (ICR) to collect information necessary to reduce many key uncertainties prior to subsequent negotiations for the Stage 2 DBPR.

Benefits of the Rule

The Stage 1 DBPR is expected to reduce the risks associated with exposure to disinfectants and DBPs. The MCLs will reduce exposure to specific DBPs from the use of ozone (byproduct: bromate), chlorine dioxide (byproduct: chlorite), and chlorine (byproducts: TTHM and five Haloacetic Acids—(HAA5)). In addition, the implementation of a treatment technique (enhanced coagulation/ enhanced softening) will reduce overall exposure to the broad range of non-specified DBPs. In the Regulatory Impact Analysis for the Stage 1 DBPR, EPA estimated that the rule will result in a national annual average reduction in TTHM levels of 24 percent. As many as 140 million people will have increased protection from DBPs and their potential health risks, including bladder cancer and adverse developmental and reproductive health effects.

2. Applicability and Compliance Dates

The 1979 Total Trihalomethane (TTHM) Rule requirements apply only to systems serving 10,000 or more people. The Stage 1 Disinfectants and Disinfection Byproducts Rule (DBPR) covers a larger number of PWSs, applying to *all* community water systems (CWSs) and nontransient noncommunity water systems (NTNCWSs) *which add a chemical disinfectant to the water in any part of the drinking water treatment process*. In addition, certain requirements apply to transient noncommunity water systems (TNCWSs) that use chlorine dioxide.

Subpart H systems (PWSs that use that use surface water or ground water under the direct influence of surface water—GWUDI—as a source) serving 10,000 or more people must comply with the requirements of the Stage 1 DBPR no later than January 2002. Subpart H systems that serve fewer than 10,000 people, and all affected ground water systems, must comply with the requirements no later than January 2004.

The timetable for the Stage 1 DBPR is presented in Table 1. The Stage 1 DBPR and the IESWTR were published simultaneously to address the inherent tradeoffs between protection from microbial contamination and the potential health effects from disinfectants and their byproducts. These rules are the first in a series of rules that will continue to address the public health concerns associated with microbial pathogens and chemical disinfectants.

Table 1: Timetable for the Stage 1 DBPR Requirements

Date	DBPR Requirement
December 16, 1998	Rule is published in Federal Register [63 FR 241 69390].
February 16, 1999	60-day legal challenge period ends.
February 16, 1999	Methods specified in 40 CFR 141.131 for analyzing disinfection byproducts, disinfection residuals, and DBP precursors are approved for use [40 CFR 141.131(a)].
January 1, 2001	Large Subpart H systems should begin monitoring to determine Step 1 TOC removal before the compliance date.
January 1, 2002	Large Subpart H CWSs and NTNCWSs must comply with the MCLs for TTHM, HAA5, bromate, and chlorite [40 CFR 141.64(b)(1)].
January 1, 2002	Large Subpart H CWSs and NTNCWSs must comply with the MRDLs for chlorine, chloramines, and chlorine dioxide [40 CFR 141.65(b)(1)].
January 1, 2002	Large Subpart H TNCWSs that use chlorine dioxide must comply with the MRDL for chlorine dioxide [40 CFR 141.65(b)(2)].
January 1, 2002	Requirements of Subpart L generally apply to large Subpart H CWSs and NTNCWs [40 CFR 141.130(b)(1)]. • Monitoring requirements. • Reporting and recordkeeping requirements. • Compliance. • Treatment technique for control of DBP precursors.
January 1, 2003	Small Subpart H systems should begin monitoring to determine Step 1 TOC removal before the compliance date.
December 31, 2003	Systems which received an extension from the state to install GAC or membranes must comply with the Stage 1 DBPR [40 CFR 141.64(b)(2)].
January 1, 2004	Small Subpart H and all ground water CWSs and NTNCWSs must comply with the MCLs for TTHM, HAA5, bromate, and chlorite [40 CFR 141.64(b)(1)].
January 1, 2004	Small Subpart H and all ground water CWSs and NTNCWSs must comply with the MRDLs for chlorine, chloramines, and chlorine dioxide [40 CFR 141.65(b)(1)].
January 1, 2004	Small Subpart H and all ground water TNCWSs that use chlorine dioxide must comply with the MRDL for chlorine dioxide [40 CFR 141.65 (b)(2)].

Date	DBPR Requirement
January 1, 2004	Requirements of Subpart L generally apply to small Subpart H and all ground water CWSs and NTNCWs [40 CFR 141.130(b)(1)]. • Monitoring requirements. • Reporting and recordkeeping requirements. • Compliance. • Treatment technique for control of DBP precursors.
June 30, 2005	Systems that made a clear and irrevocable financial commitment before the applicable compliance date to install technologies that limit TTHM and HAA5 to 0.040 mg/L and 0.030 mg/L, respectively, must have these technologies installed and operating. [40 CFR 141.135(a)(2)(iii)].

3. Summary of regulatory requirements

MCLGs and MCLs for disinfection byproducts

The Stage 1 DBPR sets maximum contaminant level goals (MCLGs) for some of the regulated DBPs, a more stringent maximum contaminant level (MCL) for TTHM, and new MCLs for HAA5, bromate, and chlorite. MCLGs are set at concentrations at which no known or anticipated adverse health effects are expected to occur. They are non-enforceable public health goals. MCLs are enforceable contaminant standards that are feasible to achieve and measure.

These MCLs, along with the MRDLs and treatment technique explained in the following paragraphs, will help reduce exposure to DBPs and disinfectants and their associated health risks.

Disinfection Byproduct	MCLG (mg/L)	MCL (mg/L)
Total Trihalomethanes (TTHM)		**0.080**
Chloroform		
Bromodichloromethane	zero	
Bromoform	zero	
Dibromochloromethane	0.06	
Five Haloacetic Acids (HAA5)		**0.060**
Monochloroacetic Acid		
Dichloroacetic Acid	zero	
Trichloroacetic Acid	0.3	
Monobromoacetic Acid		
Dibromoacetic Acid		
Chlorite	**0.8**	**1.0**
Bromate	**zero**	**0.010**

Compliance for TTHM and HAA5 MCLs is based on a running annual arithmetic average, computed quarterly, of quarterly averages of all samples. Compliance for the chlorite MCL is based on an arithmetic average of each three sample set taken in the distribution system. Compliance for the bromate MCL is based on a running annual arithmetic average, computed quarterly, of monthly samples.

MRDLGs and MRDLs for disinfectant residuals

To protect against potential health risks caused by high levels of residual disinfectants, the Stage 1 DBPR sets the following maximum residual disinfectant level goals (MRDLGs) and maximum residual disinfectant levels (MRDLs). Like MCLGs and MCLs, respectively, MRDLGs are non-enforceable, while MRDLs are enforceable.

Disinfectant	MRDLG (mg/L)	MRDL (mg/L)
Chlorine	4 (as Cl_2)	4.0 (as Cl_2)
Chloramines	4 (as Cl_2)	4.0 (as Cl_2)
Chlorine Dioxide	0.8	0.8

Systems using chlorine or chloramines may temporarily increase residual disinfectant levels to an appropriate level protect to public health in order to address specific microbiological contamination problems. These problems may be caused by circumstances such as, but not limited to, distribution line breaks, storm run-off events, source water contamination events, or cross-connection events. This option is NOT available for the use of chlorine dioxide.

Compliance for chlorine and chloramine MRDLs is based on a running annual arithmetic average, computed quarterly, of monthly averages of all samples. Compliance for the chlorine dioxide MRDL is based on consecutive daily samples.

Treatment technique for disinfection byproduct precursors

The rule includes a treatment technique that applies to Subpart H systems using conventional filtration treatment. The treatment technique was established because disinfectants can react with disinfection byproduct precursors (DBPPs) to form both regulated and non-regulated DBPs. The treatment technique requirements in the rule are designed to provide public health protection by minimizing the production of all DBPs. Compliance with the treatment technique can be achieved by removing specified percentages of Total Organic Carbon (TOC) using enhanced coagulation or enhanced softening. Alternatively, systems may comply by showing they meet alternative compliance criteria. For example, systems which have a low level of TOC in their source or treated water (less than 2.0 mg/L) meet alternative compliance criteria.

Best available technology (BAT)

EPA has specified the Best Available Technology (BAT) for each MCL and MRDL established in the rule. These technologies and methods are believed to be effective in controlling chemicals in drinking water while remaining economically feasible for PWSs to employ. PWSs must use the specified BAT if they wish to qualify for variances. Otherwise, systems are not required to install BAT and may use any technology to achieve compliance.

Chemical		Best Available Technology
DBPs	TTHM and HAA5	Enhanced coagulation or granular activated carbon (GAC 10), with chlorine as the primary and residual disinfectant
	Chlorite	Control of treatment processes to reduce disinfectant demand and control of disinfection treatment processes to reduce disinfectant levels
	Bromate	Control of ozone treatment process to reduce production of bromate
Disinfectants	Chlorine, chloramine, and chlorine dioxide	Control of treatment processes to reduce disinfectant demand and control of disinfection treatment processes to reduce disinfectant levels

Public water system recordkeeping and reporting requirements

For each disinfectant, contaminant, contaminant group, and treatment technique, EPA has developed routine compliance monitoring schemes to be protective of acute and chronic health concerns. The compliance monitoring requirements vary by the size and type of system, the treatment employed, and the disinfectant used. In many cases, systems may reduce monitoring frequencies after establishing a baseline.

Systems required to sample quarterly or more frequently must report to the state within 10 days after the end of each quarter in which the samples were collected. Those required to sample less frequently than quarterly must report to the state within 10 days after the end of each monitoring period in which samples were collected. Systems that are required to conduct additional monitoring because of the disinfectant used (e.g., chlorine dioxide) are subject to additional reporting requirements if certain chemical levels are measured.

Laboratory methods and certification

The rule specifies analytical methods for measuring each relevant water quality parameter, disinfectant, contaminant, and DBPP. Consistent with current regulations, only certified laboratories can analyze samples for compliance with the MCLs. However, chlorite measured at the entrance to the distribution systems is a trigger, not an MCL compliance sample, and may be analyzed by a party approved by the state. For disinfectants and other specified parameters that EPA believes can be adequately measured by other than certified laboratories, and for which there is good reason to allow on-site analysis (e.g., for samples that may deteriorate before reaching a certified laboratory), EPA is requiring that analyses be conducted by a party approved by the state.

4. Additional information

A series of guidance manuals have been developed to support the Interim Enhanced Surface Water Treatment Rule and the Stage 1 Disinfectants/Disinfection Byproducts Rule. The manuals will aid EPA, state agencies and affected public water systems in implementing the two interrelated rules, and will help to ensure that implementation among these groups is consistent. The manuals are available on EPA's website at www.epa.gov/safewater/mdbp/implement.html. Additional information on ordering these manuals is provided below.

Guidance Manual for Enhanced Coagulation and Enhanced Precipitative Softening (EPA 815-R-99-012)

Objective: To assist utilities in implementing, monitoring, and complying with the treatment technique requirements in the final Stage 1 Disinfectants and Disinfection Byproducts Rule and to provide guidance to state staff responsible for implementing the treatment requirements.

Contents: The manual provides detailed information on the total organic carbon (TOC) removal requirement; explains how to set an alternative TOC removal percentage under the Step 2 procedure; details monitoring, reporting, and compliance requirements; and discusses strategies that can be employed to mitigate the potential secondary effects on plant performance due to implementation of the treatment technique.

Alternative Disinfectants and Oxidants Guidance Manual (EPA 815-R-99-014)

Objective: To provide technical data and engineering information on disinfectants and oxidants that are not as commonly used as chlorine, so that systems can evaluate their options for developing disinfection schemes to control water quality problems such as zebra mussels and Asiatic clams, and oxidation to control water quality problems associated with iron and manganese.

Contents: The manual discusses six disinfectants and oxidants: ozone, chlorine dioxide, potassium permanganate, chloramines, ozone/hydrogen peroxide combinations, and ultraviolet light. A decision tree is provided to assist in evaluating which disinfectant(s) is most appropriate given certain site-specific conditions (e.g., water quality conditions, existing treatment and operator skill). The manual also contains a summary of existing alternative disinfectants used in the United states and cost estimates for the use of alternative disinfectants.

M/DBP Simultaneous Compliance Manual (EPA 815-R-99-015)

Objective: To assist public water systems on complying simultaneously with various drinking water regulations (e.g., Stage 1 Disinfectants and Disinfection Byproducts Rule, Interim Enhanced Surface Water Treatment Rule, Lead and Copper Rule and the Total Coliform Rule). The manual discusses operational problems systems may encounter when implementing these rules.

Contents: The manual provides detailed information on the requirements in the Stage 1 Disinfectants and Disinfection Byproducts Rule and the Interim Enhanced Surface Water Treatment Rule.

To order copies of these guidance manuals you may contact the Safe Drinking Water Hotline at (800) 426-4791 or you may download an electronic version from the OGWDW website at:

www.epa.gov/safewater/mdbp/implement.html

Guidance manuals are also available through the National Service Center for Environmental Publications (NSCEP) (free of charge). These documents may also be purchased through National Technical Information Service (NTIS)

NSCEP: 1.800.490.9198
NTIS: 1.800.553.6847

5. Detailed regulatory requirements

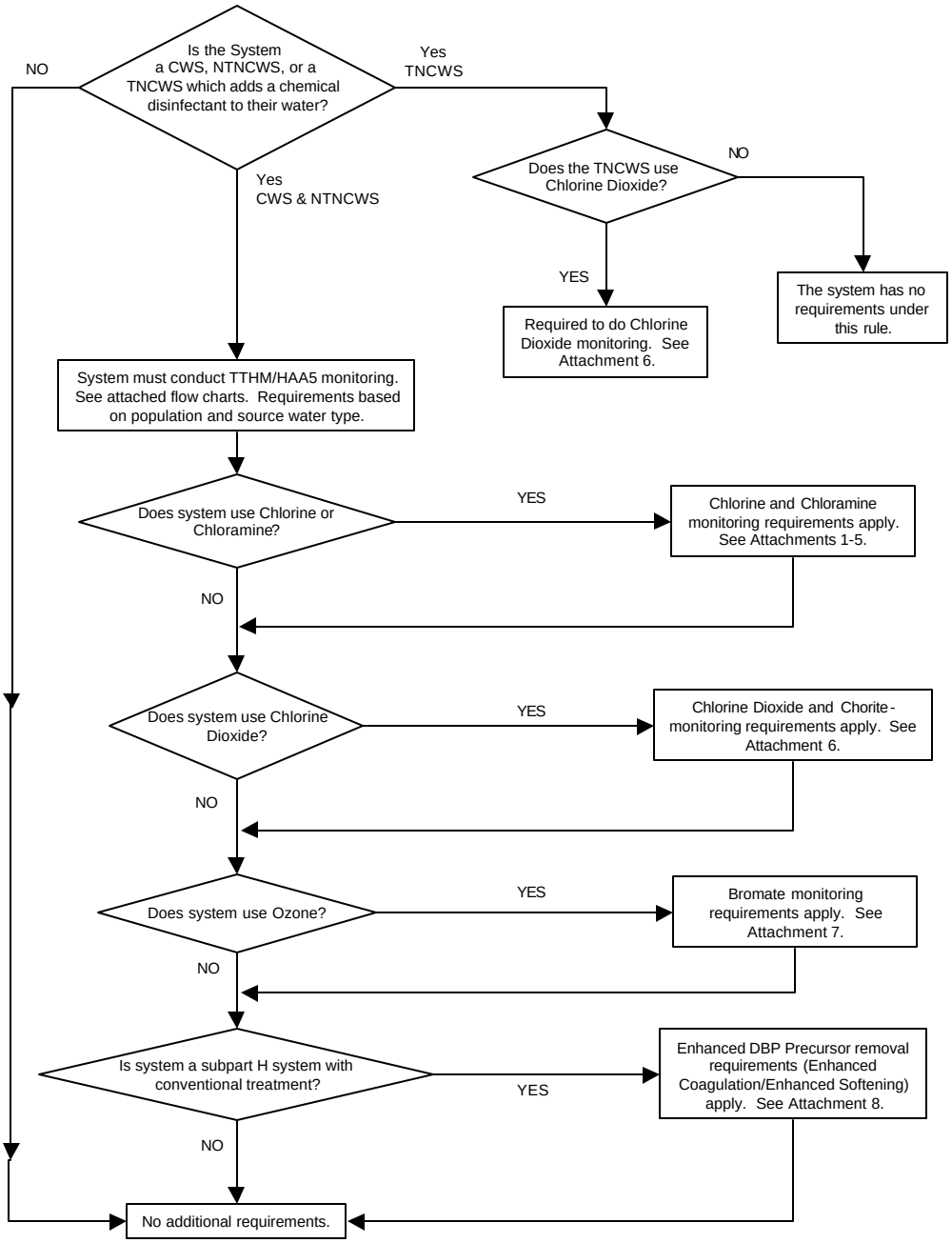
Detailed descriptions of the monitoring and reporting requirements for public water systems (PWSs) are presented in the following section. The Stage 1 DBPR applies to all community water systems and nontransient noncommunity water systems that add a chemical disinfectant or oxidant, as well as transient noncommunity water systems that treat their water with chlorine dioxide. However, systems will monitor at various frequencies depending on type (Subpart H and ground water) and size. Additionally, the type of chemical monitored will also vary depending on system type and the primary disinfectant used. For this reason, tables that outline the monitoring and reporting requirements are presented for each system size and type.

This section is organized so that specific categories of systems can turn right to where their specific requirements are. Keep in mind that some systems may fall into more than one category listed below. The categories of systems are:

- Subpart H systems serving at least 10,000 people (Attachment 1)
- Subpart H systems serving 500-9,999 people (Attachment 2)
- Subpart H systems serving fewer than 500 people (Attachment 3)
- Ground water systems serving at least 10,000 people (Attachment 4)
- Ground water systems serving fewer than 10,000 people (Attachment 5)
- Systems using chlorine dioxide (Attachment 6)
- Systems using ozone (Attachment 7)
- Subpart H systems using conventional filtration treatment (Attachment 8)

Systems should review all the attachments which apply to them to gain a full understanding of how the Stage 1 DBPR will affect them. For example, a surface water system serving 7,000 people using conventional filtration and chlorine dioxide as an oxidant should review Attachments 2, 6, and 8.

Stage 1 DPBR General Requirements



I operate a surface water system or ground water system under the direct influence of surface water that serves at least 10,000 people . . .

(Attachment 1) I operate a surface water system or ground water system under the direct influence of surface water that serves at least 10,000 people . . .

You must conduct the monitoring, compliance determinations, reporting, and recordkeeping specified in this section. In addition, you are required to conduct additional monitoring, compliance determinations, reporting and recordkeeping if you meet any of the following criteria:

- You use chlorine dioxide in treating your water. This includes any use of chlorine dioxide, not just chlorine dioxide used for meeting disinfection requirements. Additional requirements are found in Attachment 6.

- You use ozone in treating your water. This includes any use of ozone, not just ozone used for meeting disinfection requirements. Additional requirements are found in Attachment 7.

- You operate a treatment plant that uses conventional filtration treatment. Additional requirements are found in Attachment 8.

In addition, you must develop and implement a monitoring plan that specifies 1) location and schedules for collecting all required samples, 2) procedures for calculating compliance with MCLs, MRDLs, and treatment techniques, and 3) if receiving water as a consecutive system, or supplying water to a consecutive system, how the entire distribution system is represented. The monitoring plan must be submitted to the state.

(Attachment 1) I operate a surface water system or ground water system under the direct influence of surface water that serves at least 10,000 people . . .

What* ROUTINE MONITORING *must I conduct under the Stage 1 DBPR?

Chemical	Frequency	Where monitoring must be conducted
TTHM and HAA5	4 samples per plant per quarter	At least 25% of samples must be at locations representing maximum residence time. Remaining samples must represent average residence time and the entire distribution system (account for number of people served, different sources of water, different treatment methods).
Chlorine and Chloramines	Same time as total coliform samples are taken	Same locations as total coliform samples are taken.

Notes:

1. If a system elects to sample more frequently than the minimum required, at least 25% 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.

What* REDUCED MONITORING *may I conduct under the Stage 1 DBPR?

Chemical	Frequency	Where monitoring must be conducted	Conditions for reduced monitoring
TTHM and HAA5	One sample per plant per quarter	In the distribution system at a location representing maximum residence time.	• Source water annual average TOC before any treatment # 4.0 mg/L and • Annual average TTHM # 0.040 mg/L and • Annual average HAA5 # 0.030 mg/L
Chlorine and Chloramines	No reduced monitoring	NA	NA

(Attachment 1) I operate a surface water system or ground water system under the direct influence of surface water that serves at least 10,000 people . . .

How do I* DETERMINE IF MY SYSTEM IS IN COMPLIANCE *with the MCLs and MRDLs in the Stage 1 DBPR?

Chemical	Compliance is based on . . .
TTHM and HAA5	**Running annual arithmetic average, computed quarterly, of quarterly arithmetic averages of all samples collected.** • If annual arithmetic average of quarterly averages covering any consecutive 4-quarter period exceeds the MCL, then the system is in violation. • The system must notify the public and report to the state if in violation. • If an annual average exceeds the MCL and the system is on reduced monitoring, it must revert to routine monitoring immediately.
Chlorine and Chloramines	**Running annual arithmetic average, computed quarterly, of quarterly averages of all samples collected.** • If annual arithmetic average of quarterly averages covering any consecutive 4-quarter period exceeds the MRDL, then the system is in violation. • The system must notify the public and report to the state if in violation. • If system switches between chlorine and chloramines for residual disinfection during the year, compliance must be determined by including together all monitoring results of both chlorine and chloramines.

NOTES:

1. 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 the MCLs or MRDLs, this failure to monitor will be treated as a violation for the entire period covered by the annual average.

2. All samples taken and analyzed under the provisions of the monitoring plan must be included in determining compliance, even if that number is greater than the minimum required.

3. If during the first year of monitoring, 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.

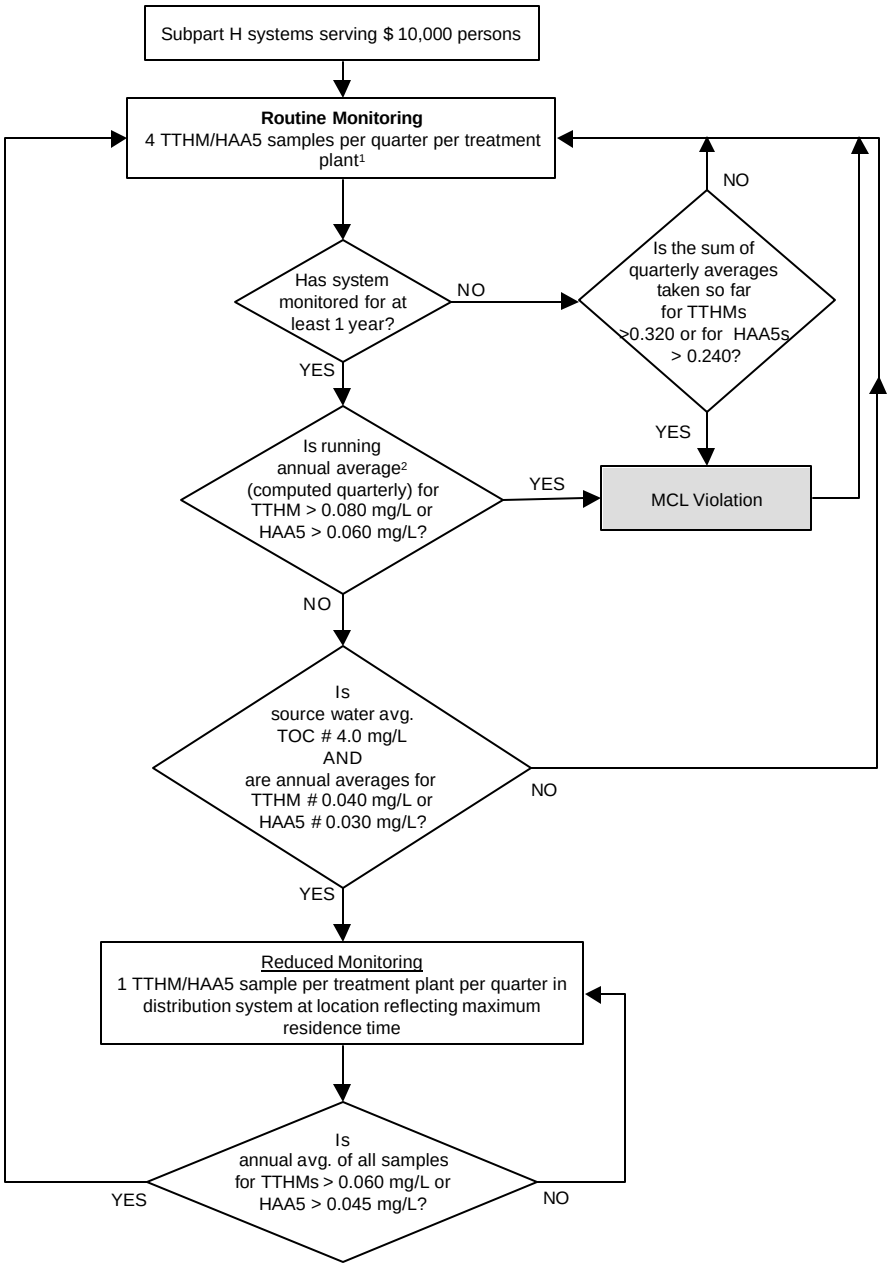
What do I have to* REPORT *to the State under the Stage 1 DBPR?

Chemical	What must be reported
TTHM and HAA5	If conducting routine or reduced monitoring: • Number of samples taken during last quarter • Location, date, result of each sample taken during last quarter • Arithmetic average of all samples taken in last quarter • Annual arithmetic average of quarterly averages for last 4 quarters • Whether MCL was exceeded (Report violation of the MCL)
Chlorine and Chloramines	• Number of samples taken during each month of last quarter • Monthly arithmetic average of all samples taken in each month • Arithmetic average of all monthly averages for last 12 months • Whether MRDL was exceeded (Report violation of MRDL)

NOTES:

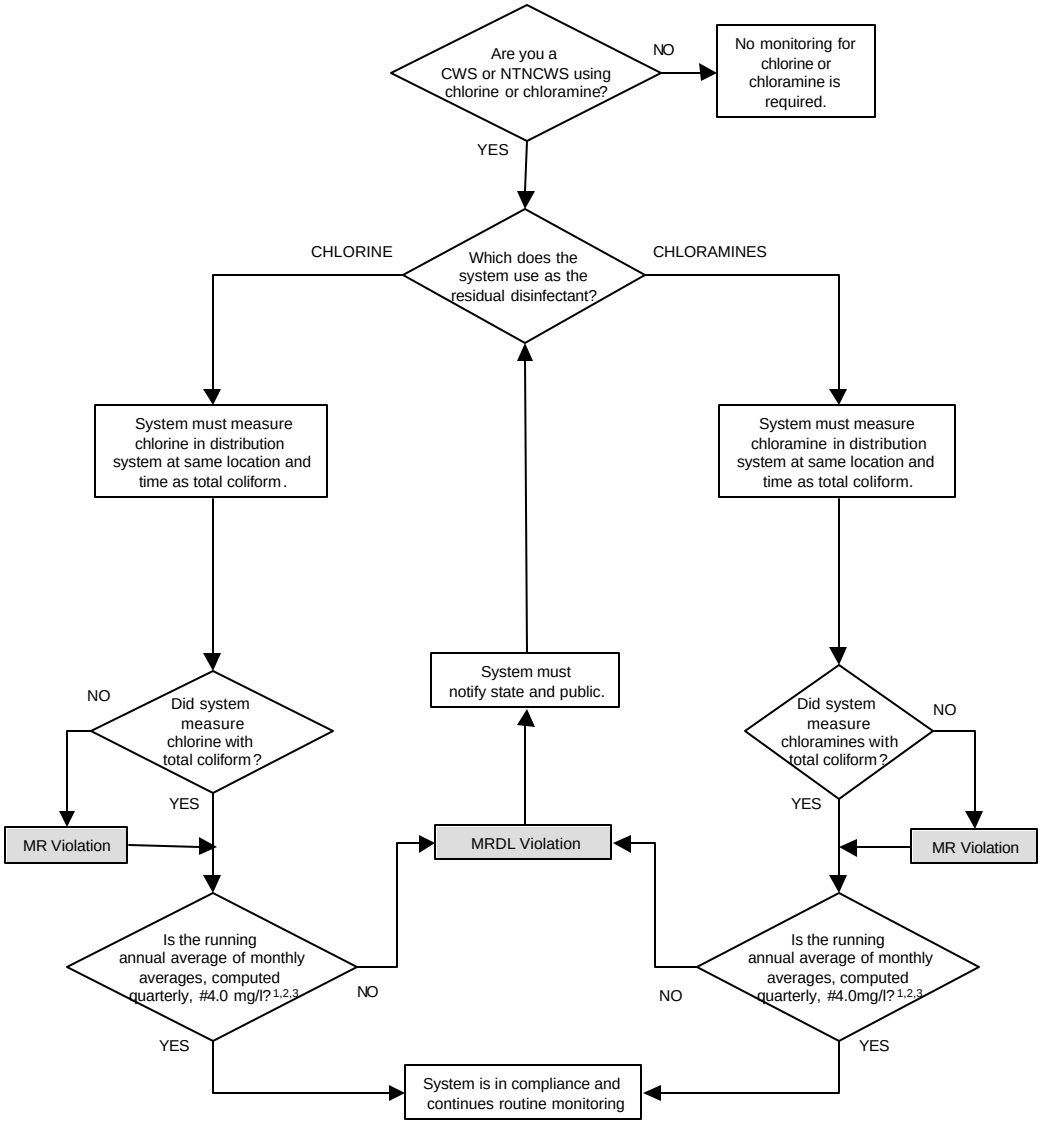
1. Systems required to sample quarterly or more frequently must report to the state within 10 days after the end of each quarter in which samples were collected.

TTHMs & HAA5 Monitoring Requirements for Subpart H Systems Serving $10,000 Persons



NOTES
[1] 3 samples reflect average residence time and 1 sample reflects maximum residence time (at least 25% of samples must reflect maximum residence time).
[2] If PWS fails to complete 4 consecutive quarters of monitoring, compliance with the MCL for the last 4 quarter period must be based on average of available data.

Monitoring Requirements for Chlorine and Chloramine



NOTES
1. Notwithstanding the MRDLs for chlorine and chloramines, systems may increase residual disinfectant levels of chlorine or chloramines in the distribution system to a level and for a time necessary to protect publich health to address specific microbiological contamination problems.
2. If system switches between use of chlorine and chloramines, compliance must be determined by including together all monitoring results of both chlorine and chloramines in calculating compliance.
3. Running annual average is first calculated after first 12 months of monitoring.

I operate a surface water system or ground water system under the direct influence of surface water that serves 500 to 9,999 people . . .

(Attachment 2) I operate a surface water system or ground water system under the direct influence of surface water that serves 500 to 9,999 people . . .

You must conduct the monitoring, compliance determinations, reporting , and recordkeeping specified in this section. In addition, you are required to conduct additional monitoring, compliance determinations, reporting and recordkeeping if you meet either of the following criteria:

- You use chlorine dioxide in treating your water. This includes any use of chlorine dioxide, not just chlorine dioxide used for meeting disinfection requirements. Additional requirements are found in Attachment 6.

- You use ozone in treating your water. This includes any use of ozone, not just ozone used for meeting disinfection requirements. Additional requirements are found in Attachment 7.

- You operate a treatment plant that uses conventional filtration treatment. Additional requirements are found in Attachment 8.

In addition, you must develop and implement a monitoring plan that specifies 1) location and schedules for collecting all required samples, 2) procedures for calculating compliance with MCLs, MRDLs, and treatment techniques, and 3) if receiving water as a consecutive system, or supplying water to a consecutive system, how the entire distribution system is represented. For systems serving more than 3,300 people the monitoring plan must be submitted to the state.

(Attachment 2) I operate a surface water system or ground water system under the direct influence of surface water that serves 500 to 9,999 people . . .

What* ROUTINE MONITORING *must I conduct under the Stage 1 DBPR?

Chemical	Frequency	Where monitoring must be conducted
TTHM and HAA5	One sample per plant per quarter	Location representing maximum residence time.
Chlorine and Chloramines	Same time as total coliform samples are taken	Same points as total coliform samples are taken.

NOTES

1. If a system elects to sample more frequently than the minimum required, at least 25% 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 entire distribution system (account for number of people served, different sources of water, different treatment methods)

What* REDUCED MONITORING *may I conduct under the Stage 1 DBPR?

Chemical	Frequency	Where monitoring must be conducted	Conditions for reduced monitoring
TTHM and HAA5	One sample per plant per year during month of warmest temperature	In the distribution system at a location representing maximum residence time.	• Source water annual average TOC before any treatment # 4.0 mg/L and • Annual average TTHM # 0.040 mg/L and • Annual average HAA5 # 0.030 mg/L
Chlorine and Chloramines	No reduced monitoring	NA	NA

How do I* DETERMINE IF MY SYSTEM IS IN COMPLIANCE *with the MCLs and MRDLs in the Stage 1 DBPR?

Chemical	Compliance is based on . . .
TTHM and HAA5	**Running annual arithmetic average, computed quarterly, of quarterly arithmetic averages of all samples collected (routine monitoring).** • If annual arithmetic average of quarterly averages covering any consecutive 4-quarter period exceeds the MCL, then the system is in violation. • The system must notify the public and report to the state if in violation. • If an annual average exceeds the MCL and the system is on reduced monitoring, it must revert to routine monitoring immediately.
Chlorine and Chloramines	**Running annual arithmetic average, computed quarterly, of quarterly averages of all samples collected.** • If annual arithmetic average of quarterly averages covering any consecutive 4-quarter period exceeds the MRDL, then the system is in violation. • The system must notify the public and report to the state if in violation. • If system switches between chlorine and chloramines for residual disinfection during the year, compliance must be determined by including together all monitoring results of both chlorine and chloramines.

NOTES:

1. 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 the MCLs or MRDLs, this failure to monitor will be treated as a violation for the entire period covered by the annual average.

2. All samples taken and analyzed under the provisions of the monitoring plan must be included in determining compliance, even if that number is greater than the minimum required.

3. If during the first year of monitoring, 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.

What do I have to* REPORT *to the State under the Stage 1 DBPR?

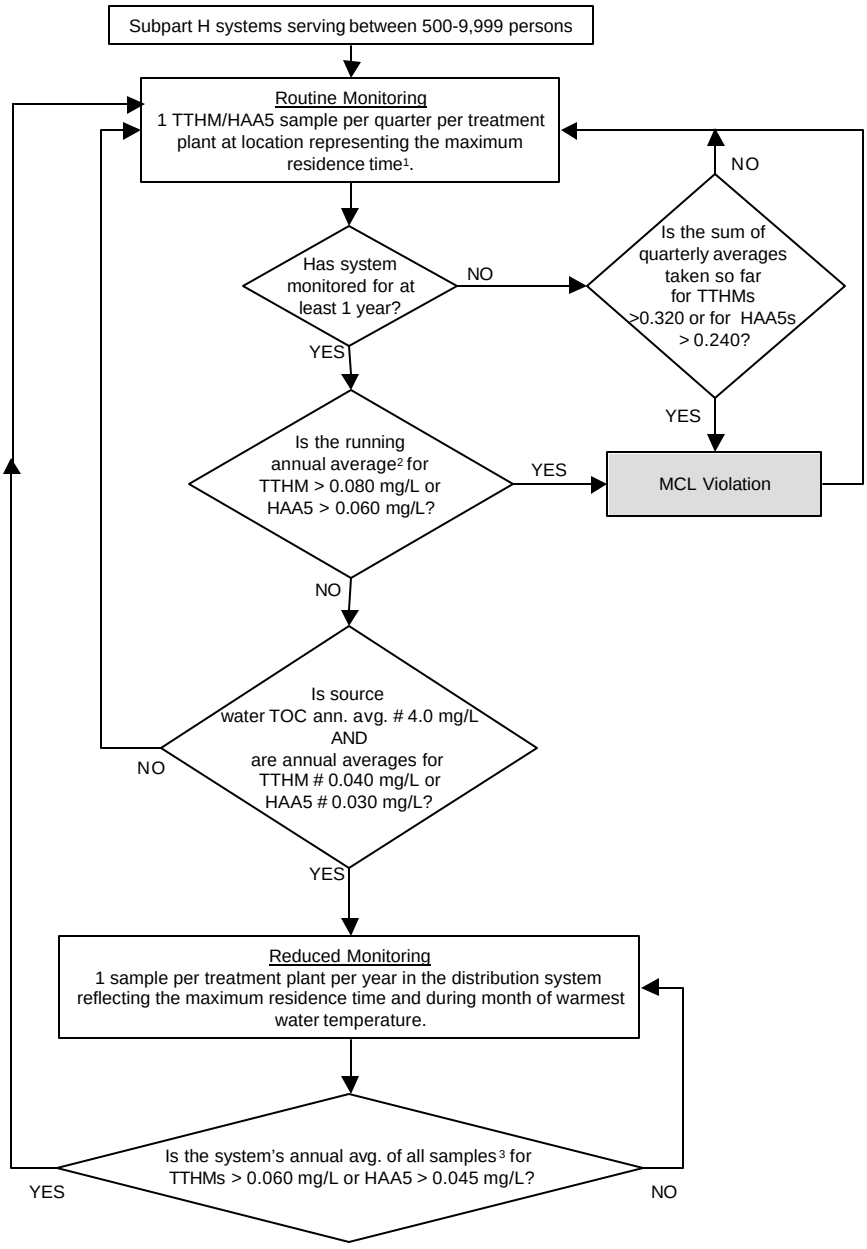
Chemical	What must be reported
TTHM and HAA5	• Number of samples taken during last quarter (routine monitoring) • Location, date, result of each sample taken during last quarter • Arithmetic average of all samples taken in last quarter • Annual arithmetic average of quarterly averages for last 4 quarters • Whether MCL was exceeded *If conducting reduced monitoring:* • Number of samples taken during last year • Location, date, result of each sample taken during last year • Arithmetic average of all samples taken over last year • Whether MCL was exceeded
Chlorine and Chloramines	• Number of samples taken during each month of last quarter • Monthly arithmetic average of all samples taken in each month • Arithmetic average of all monthly averages for last 12 months • Whether MRDL was exceeded

NOTES:

1. Systems required to sample quarterly or more frequently must report to the state within 10 days after the end of each quarter in which samples were collected.

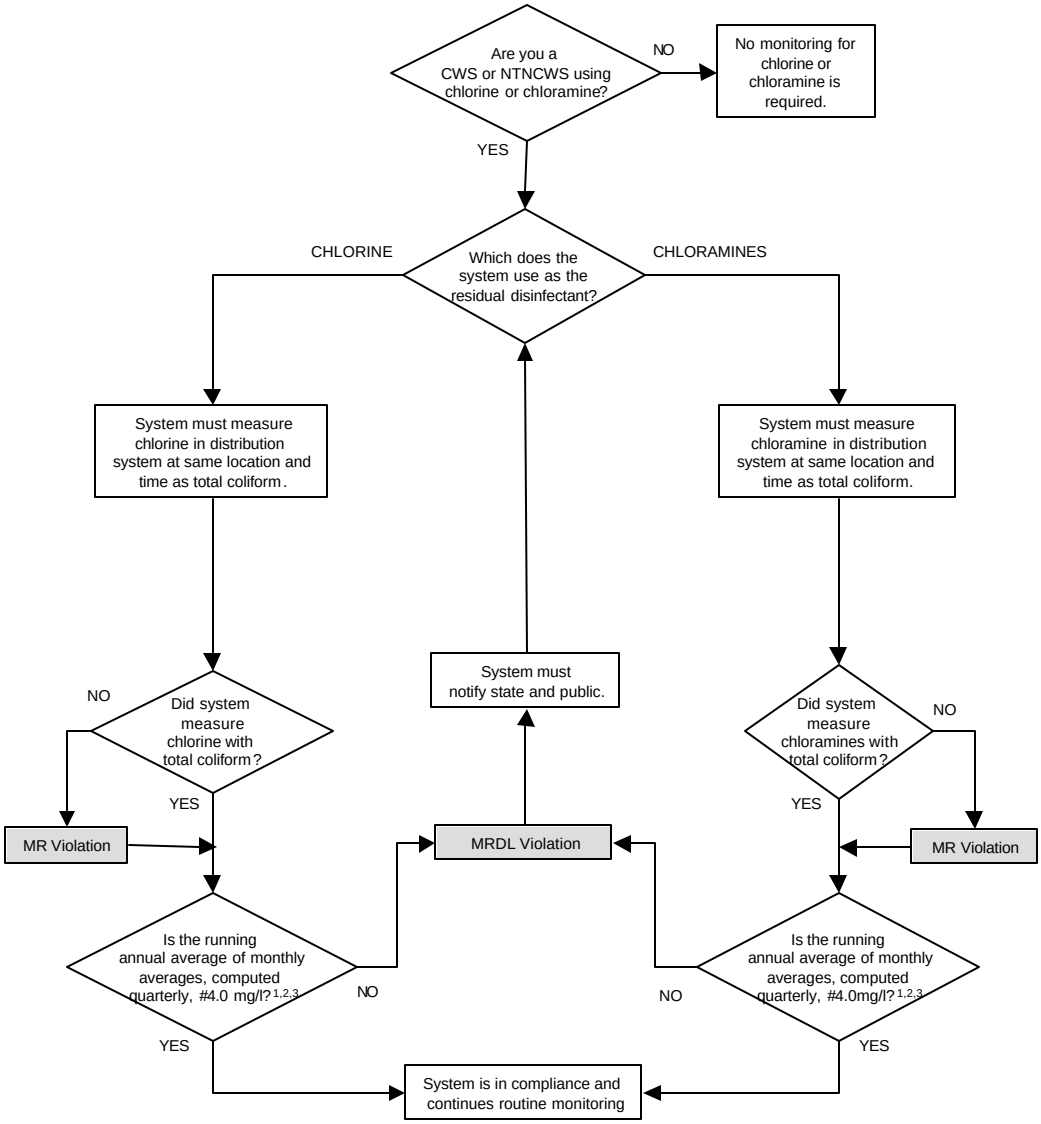
2. Systems required to sample less frequently than quarterly must report to the state within 10 days after the end of each monitoring period in which samples were collected. The state may choose to perform calculations and determine whether the MCL, MRDL, or treatment technique was met in lieu of having the system report that information.

TTHM & HAA5 Monitoring for Subpart H Systems Serving Between 500-9,999 Persons



NOTES
[1] If more than1 sample,at least 25% of samples must reflect max residence time.
[2] If PWS fails to complete 4 consecutive quarters of monitoring, compliance with the MCL for the last 4 quarter period must be based on average of available data.
[3] Average of all samples taken in the year or the result of the sample for systems which must monitor no more frequently than annually.

Monitoring Requirements for Chlorine and Chloramine



NOTES
1. Notwithstanding the MRDLs for chlorine and chloramines, systems may increase residual disinfectant levels of chlorine or chloramines in the distribution system to a level and for a time necessary to protect publich health to address specific microbiological contamination problems.
2. If system switches between use of chlorine and chloramines, compliance must be determined by including together all monitoring results of both chlorine and chloramines in calculating compliance.
3. Running annual average is first calculated after first 12 months of monitoring.

I operate a surface water system or ground water system under the direct influence of surface water that serves fewer than 500 people . . .

(Attachment 3) I operate a surface water system or ground water system under the direct influence of surface water that serves fewer than 500 people . . .

You must conduct the monitoring, compliance determinations, reporting , and recordkeeping specified in this section. In addition, you are required to conduct additional monitoring, compliance determinations, reporting and recordkeeping if you meet either of the following criteria:

- You use chlorine dioxide in treating your water. This includes any use of chlorine dioxide, not just chlorine dioxide used for meeting disinfection requirements. Additional requirements are found in Attachment 6.

- You use ozone in treating your water. This includes any use of ozone, not just ozone used for meeting disinfection requirements. Additional requirements are found in Attachment 7.

- You operate a treatment plant that uses conventional filtration treatment. Additional requirements are found in Attachment 8.

In addition, you must develop and implement a monitoring plan that specifies 1) location and schedules for collecting all required samples, 2) procedures for calculating compliance with MCLs, MRDLs, and treatment techniques, and 3) if receiving water as a consecutive system, or supplying water to a consecutive system, how the entire distribution system is represented. The monitoring plan must be kept on hand and readily available to the state and public.

(Attachment 3) I operate a surface water system or ground water system under the direct influence of surface water that serves fewer than 500 people . . .

What* ROUTINE MONITORING *must I conduct under the Stage 1 DBPR?

Chemical	Frequency	Where monitoring must be conducted
TTHM and HAA5	• One sample per plant per year during month of warmest water temperature - if MCL is exceeded in yearly sample, system goes to increased monitoring of 1 sample per plant per quarter	Location representing maximum residence time.
Chlorine and Chloramines	Same time as total coliform samples are taken	Same points as total coliform samples are taken.

NOTES

1. The system may revert to annual monitoring if the annual average is #40/30 based on at least four quarters of monitoring.

2. If a system elects to sample more frequently than the minimum required, at least 25% 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.

What* REDUCED MONITORING *may I conduct under the Stage 1 DBPR?

Chemical	Frequency	Where monitoring must be conducted	Conditions for reduced monitoring
TTHM and HAA5	No reduced monitoring	NA	NA
Chlorine and Chloramines	No reduced monitoring	NA	NA

(Attachment 3) I operate a surface water system or ground water system under the direct influence of surface water that serves fewer than 500 people . . .

How do I* DETERMINE IF MY SYSTEM IS IN COMPLIANCE *with the MCLs and MRDLs in the Stage 1 DBPR?

Chemical	Compliance is based on . . .
TTHM and HAA5	**Average of samples taken in the year.** • If the average of these samples exceeds the MCL, the system must increase monitoring to once per quarter per treatment plant. Compliance will be based on 4 quarters of monitoring. • The system must notify the public and report to the state if in violation. • If an annual average exceeds the MCL and the system is on reduced monitoring, it must go to increased monitoring immediately. If a system on increased monitoring exceeds the MCL, it is in violation.
Chlorine and Chloramines	**Running annual arithmetic average, computed quarterly, of quarterly averages of all samples collected.** • If annual arithmetic average of quarterly averages covering any consecutive 4-quarter period exceeds the MRDL, then the system is in violation. • The system must notify the public and report to the state if in violation. • If system switches between chlorine and chloramines for residual disinfection during the year, compliance must be determined by including together all monitoring results of both chlorine and chloramines.

NOTES:

1. 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 the MCLs or MRDLs, this failure to monitor will be treated as a violation for the entire period covered by the annual average.

2. All samples taken and analyzed under the provisions of the monitoring plan must be included in determining compliance, even if that number is greater than the minimum required.

3. If during the first year of monitoring, 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.

What do I have to* REPORT *to the State under the Stage 1 DBPR?

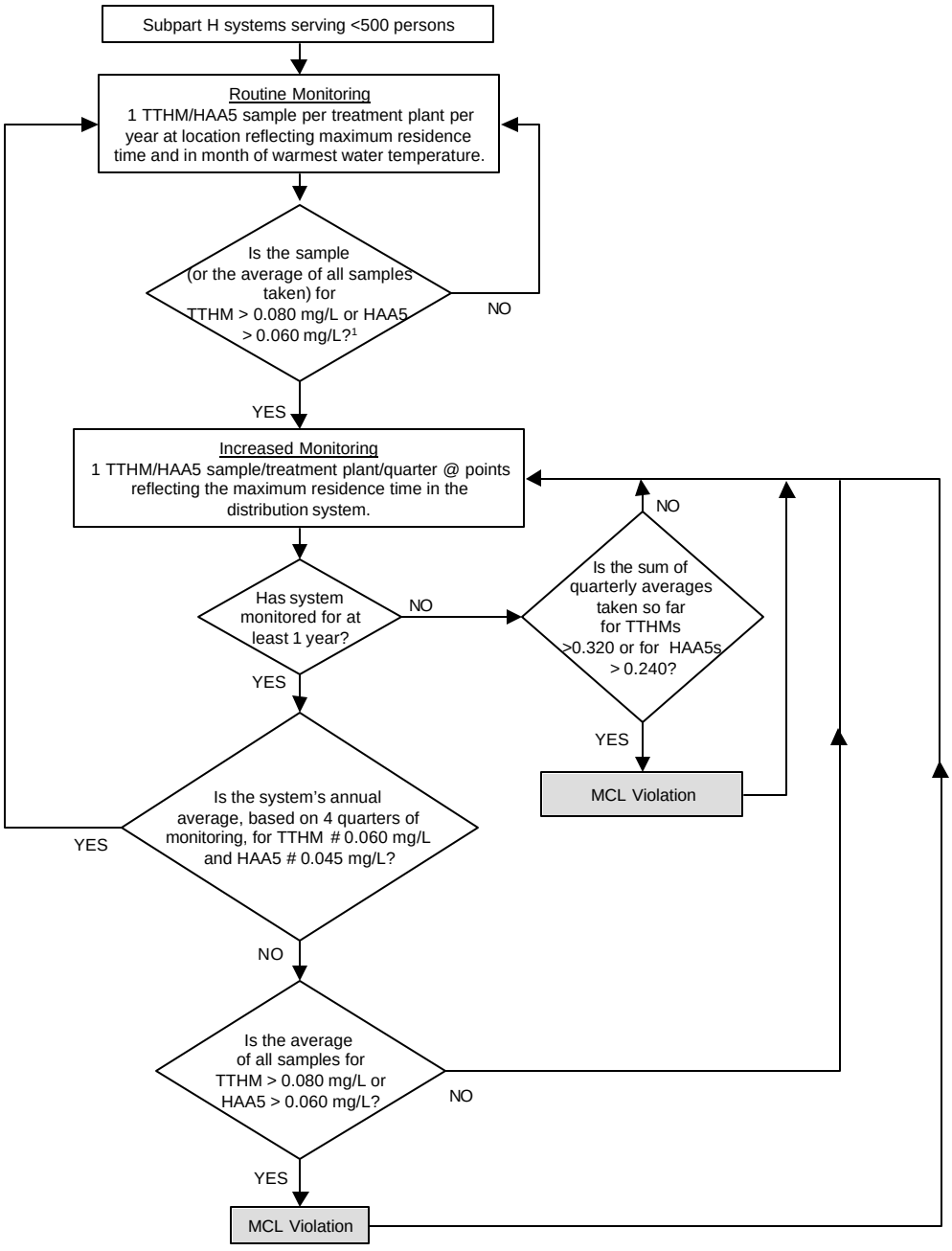
Chemical	What must be reported
TTHM and HAA5	• Number of samples taken during last year (or in last quarter if on increased monitoring) • Location, date, result of each sample taken during last year • Arithmetic average of all samples taken over last year • Whether MCL was exceeded
Chlorine and Chloramines	• Number of samples taken during each month of last quarter • Monthly arithmetic average of all samples taken in each month • Arithmetic average of all monthly averages for last 12 months • Whether MRDL was exceeded

NOTES:

1. Systems required to sample quarterly or more frequently must report to the state within 10 days after the end of each quarter in which samples were collected.

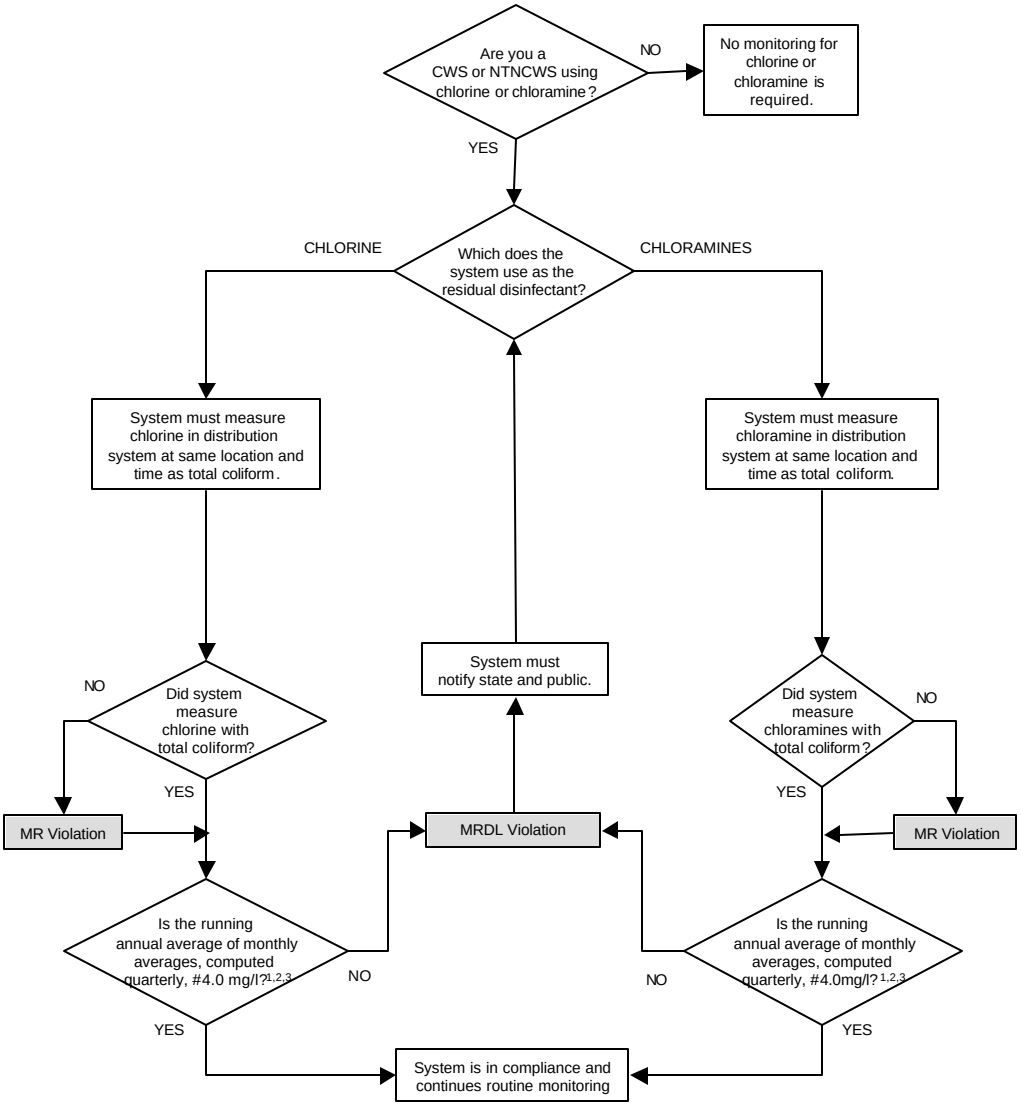
2. Systems required to sample less frequently than quarterly must report to the state within 10 days after the end of each monitoring period in which samples were collected. The state may choose to perform calculations and determine whether the MCL, MRDL, or treatment technique was met in lieu of having the system report that information.

TTHM & HAA5 Monitoring for Subpart H Systems Serving <500 Persons



NOTES
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.

Monitoring Requirements for Chlorine and Chloramine



NOTES
1. Notwithstanding the MRDLs for chlorine and chloramines, systems may increase residual disinfectant levels of chlorine or chloramines in the distribution system to a level and for a time necessary to protect publich health to address specific microbiological contamination problems.
2. If system switches between use of chlorine and chloramines, compliance must be determined by including together all monitoring results of both chlorine and chloramines in calculating compliance.
3. Running annual average is first calculated after first 12 months of monitoring.

I operate a ground water system not under the direct influence of surface water that serves at least 10,000 people . . .

(Attachment 4) I operate a ground water system not under the direct influence of surface water that serves at least 10,000 people . . .

You must conduct the monitoring, compliance determinations, reporting , and recordkeeping specified in this section. In addition, you are required to conduct additional monitoring, compliance determinations, reporting and recordkeeping if you meet either of the following criteria:

- You use chlorine dioxide in treating your water. This includes any use of chlorine dioxide, not just chlorine dioxide used for meeting disinfection requirements. Additional requirements are found in Attachment 6.

- You use ozone in treating your water. This includes any use of ozone, not just ozone used for meeting disinfection requirements. Additional requirements are found in Attachment 7.

In addition, you must develop and implement a monitoring plan that specifies 1) location and schedules for collecting all required samples, 2) procedures for calculating compliance with MCLs and MRDLs, and 3) if receiving water as a consecutive system, or supplying water to a consecutive system, how the entire distribution system is represented. The monitoring plan must be kept for review by the state and public.

(Attachment 4) I operate a ground water system not under the direct influence of surface water that serves at least 10,000 people . . .

What* ROUTINE MONITORING *must I conduct under the Stage 1 DBPR?

Chemical	Frequency	Where monitoring must be conducted
TTHM and HAA5	One sample per plant per quarter	Location representing maximum residence time.
Chlorine and Chloramines	Same time as total coliform samples are taken	Same points as total coliform samples are taken.

NOTES:

1. Multiple wells drawing water from a single aquifer may be considered one treatment plant for determining the minimum number of samples required, with state approval.

2. If a system elects to sample more frequently than the minimum required, at least 25% 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.

What* REDUCED MONITORING *may I conduct under the Stage 1 DBPR?

Chemical	Frequency	Where monitoring must be conducted	Conditions for reduced monitoring
TTHM and HAA5	One sample per plant per year during month of warmest water temperature	Location representative of maximum residence time	• Annual average TTHM # 0.040 mg/L and • Annual average HAA5 # 0.030 mg/L
Chlorine and Chloramines	No reduced monitoring	NA	NA

(Attachment 4) I operate a ground water system not under the direct influence of surface water that serves at least 10,000 people . . .

How do I* DETERMINE IF MY SYSTEM IS IN COMPLIANCE *with the MCLs and MRDLs of the Stage 1 DBPR?

Chemical	Compliance is based on . . .
TTHM and HAA5	**Running annual arithmetic average, computed quarterly, of quarterly arithmetic averages of all samples collected.** • If annual arithmetic average of quarterly averages covering any consecutive 4-quarter period exceeds the MCL, then the system is in violation. • The system must notify the public and report to the state if in violation. • If an annual average exceeds the MCL and the system is on reduced monitoring, it must revert to routine monitoring immediately.
Chlorine and Chloramines	**Running annual arithmetic average, computed quarterly, of quarterly averages of all samples collected.** • If annual arithmetic average of quarterly averages covering any consecutive 4-quarter period exceeds the MRDL, then the system is in violation. • The system must notify the public and report to the state if in violation. • If system switches between chlorine and chloramines for residual disinfection during the year, compliance must be determined by including together all monitoring results of both chlorine and chloramines.

NOTES:

1. 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 the MCLs or MRDLs, this failure to monitor will be treated as a violation for the entire period covered by the annual average.

2. All samples taken and analyzed under the provisions of the monitoring plan must be included in determining compliance, even if that number is greater than the minimum required.

3. If during the first year of monitoring, 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.

What do I have to* REPORT *to the State under the Stage 1 DBPR?

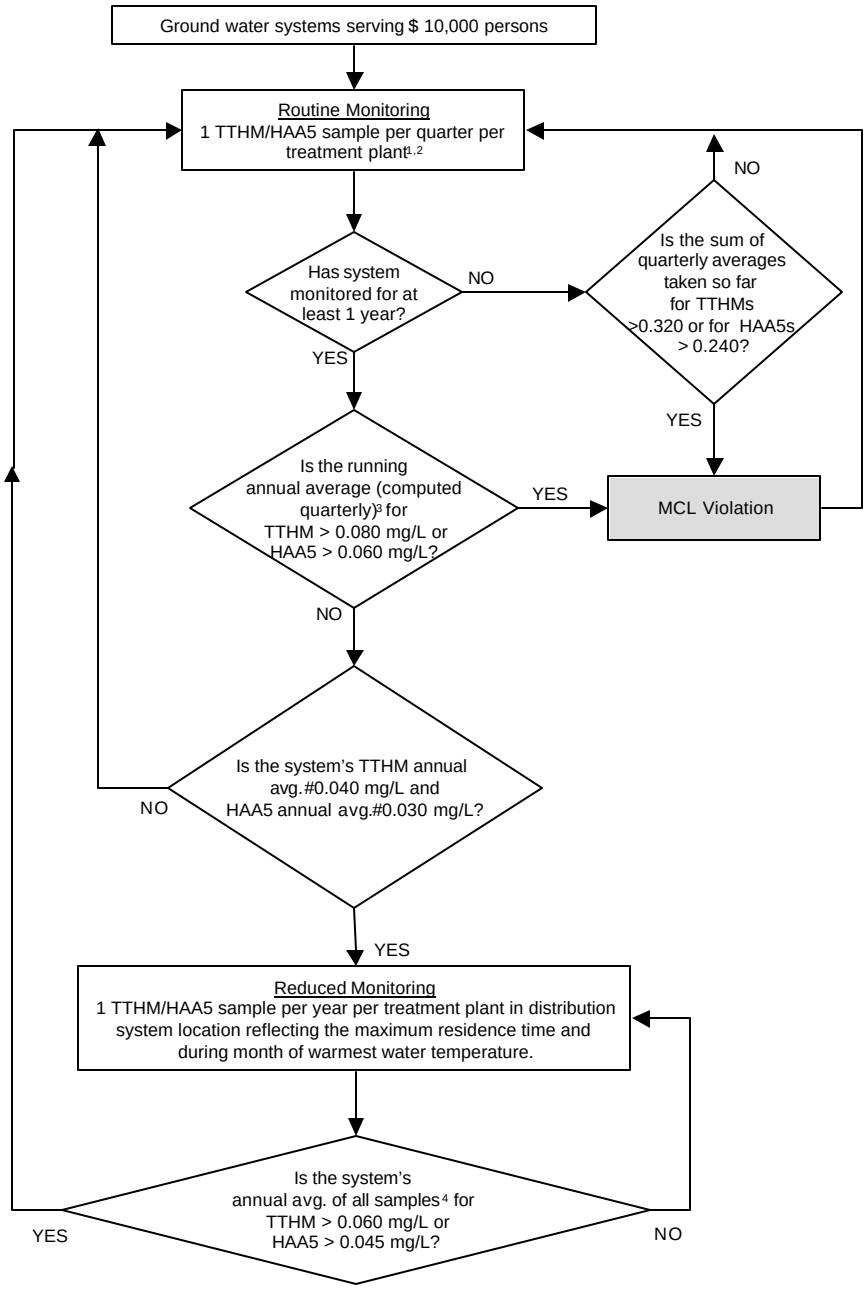
Chemical	What must be reported
TTHM and HAA5	• Number of samples taken during last quarter • Location, date, result of each sample taken during last quarter • Arithmetic average of all samples taken during last quarter • Annual arithmetic average of quarterly arithmetic average for last 4 quarters • Whether MCL was exceeded *If conducting reduced monitoring:* • Number of samples taken during last year • Location, date, result of each sample taken during last year • Arithmetic average of all samples taken over last year • Whether MCL was exceeded
Chlorine and Chloramines	• Number of samples taken during each month of last quarter • Monthly arithmetic average of all samples taken in each month • Arithmetic average of all monthly averages for last 12 months • Whether MRDL was exceeded

NOTES:

1. Systems required to sample quarterly or more frequently must report to the state within 10 days after the end of each quarter in which samples were collected.

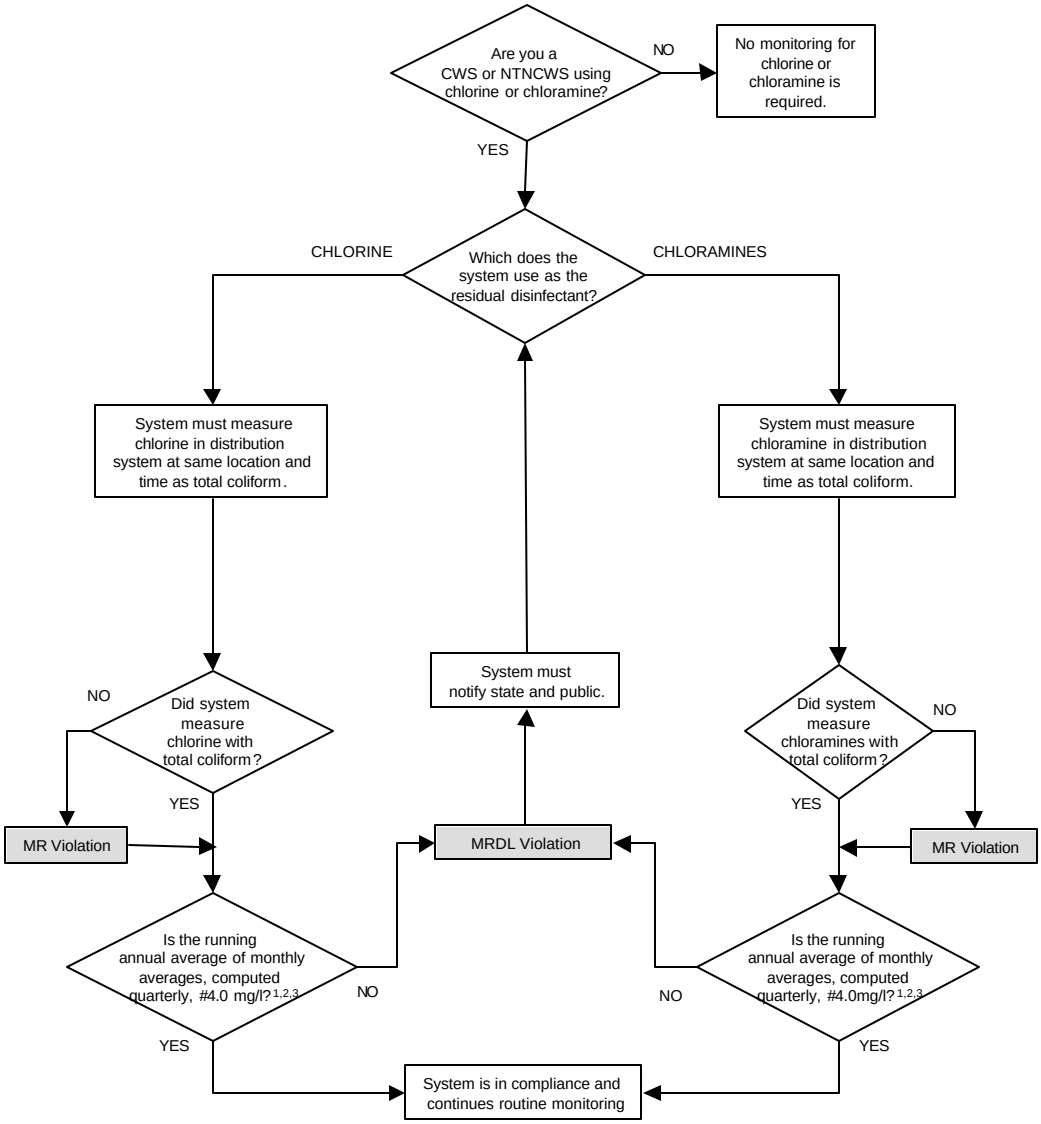
2. Systems required to sample less frequently than quarterly must report to the state within 10 days after the end of each monitoring period in which samples were collected. The state may choose to perform calculations and determine whether the MCL, MRDL, or treatment technique was met in lieu of having the system report that information.

TTHM & HAA5 Monitoring for Ground Water Systems Serving $ 10,000 Persons



NOTES
1) If more than1 sample is taken, 25% must reflect maximum residence time.
2) Multiple wells drawing water from a single aquifer may be considered one treatment plant.
3) If PWS fails to complete 4 consecutive quarters of monitoring, compliance with the MCL for the last 4 quarter period must be based on average of available data.
4) Average of all samples taken in the year or the result of the sample for systems which must monitor no more frequently than annually.

Monitoring Requirements for Chlorine and Chloramine



NOTES
1. Notwithstanding the MRDLs for chlorine and chloramines, systems may increase residual disinfectant levels of chlorine or chloramines in the distribution system to a level and for a time necessary to protect publich health to address specific microbiological contamination problems.
2. If system switches between use of chlorine and chloramines, compliance must be determined by including together all monitoring results of both chlorine and chloramines in calculating compliance.
3. Running annual average is first calculated after first 12 months of monitoring.

I operate a ground water system not under the direct influence of surface water that serves fewer than 10,000 people . . .

(Attachment 5) I operate a ground water system not under the direct influence of surface water that serves fewer than 10,000 people . . .

You must conduct the monitoring, compliance determinations, reporting , and recordkeeping specified in this section. In addition, you are required to conduct additional monitoring, compliance determinations, reporting and recordkeeping if you meet either of the following criteria:

- You use chlorine dioxide in treating your water. This includes any use of chlorine dioxide, not just chlorine dioxide used for meeting disinfection requirements. Additional requirements are found in Attachment 6.

- You use ozone in treating your water. This includes any use of ozone, not just ozone used for meeting disinfection requirements. Additional requirements are found in Attachment 7.

In addition, you must develop and implement a monitoring plan that specifies 1) location and schedules for collecting all required samples, 2) procedures for calculating compliance with MCLs, MRDLs, and treatment techniques, and 3) if receiving water as a consecutive system, or supplying water to a consecutive system, how the entire distribution system is represented. The monitoring plan must be made available for review by the state and public.

(Attachment 5) I operate a ground water system not under the direct influence of surface water that serves fewer than 10,000 people . . .

What* ROUTINE MONITORING *must I conduct under the Stage 1 DBPR?

Chemical	Frequency	Where monitoring must be conducted
TTHM and HAA5	One sample per plant per year during month of warmest water temperature	Location representing maximum residence time.
Chlorine and Chloramines	Same time as total coliform samples are taken	Same points as total coliform samples are taken.

NOTES:

1. Multiple wells drawing water from a single aquifer may be considered one treatment plant for determining the minimum number of samples required, with state approval.

2. If a system elects to sample more frequently than the minimum required, at least 25% 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.

What* REDUCED MONITORING *may I conduct under the Stage 1 DBPR?

Chemical	Frequency	Where monitoring must be conducted	Conditions for reduced monitoring
TTHM and HAA5	One sample per plant per 3-year cycle during month of warmest water temperature	Location representative of maximum residence time.	• Annual average TTHM # 0.040 mg/L & annual average HAA5 # 0.030 mg/L for 2 consecutive years; OR • Annual average TTHM # 0.020 mg/L & annual average HAA5 # 0.015 mg/L for 1 year
Chlorine and Chloramines	No reduced monitoring	NA	NA

(Attachment 5) I operate a ground water system not under the direct influence of surface water that serves fewer than 10,000 people . . .

How do I* DETERMINE IF MY SYSTEM IS IN COMPLIANCE *with the MCLs and MRDLs of the Stage 1 DBPR?

Chemical	Compliance is based on . . .
TTHM and HAA5	**Average of samples taken in the year.** • If the average of these samples exceeds the MCL, the system must increase monitoring to once per quarter per treatment plant. • The system must notify the public and report to the state if in violation. • If an annual average exceeds the MCL and the system is on reduced monitoring, it must go to increased monitoring immediately. If a system on increased monitoring exceeds the MCL, it is in violation.
Chlorine and Chloramines	**Running annual arithmetic average, computed quarterly, of quarterly averages of all samples collected.** • If annual arithmetic average of quarterly averages covering any consecutive 4-quarter period exceeds the MRDL, then the system is in violation. • The system must notify the public and report to the state if in violation. • If system switches between chlorine and chloramines for residual disinfection during the year, compliance must be determined by including together all monitoring results of both chlorine and chloramines.

NOTES:

1. 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 the MCLs or MRDLs, this failure to monitor will be treated as a violation for the entire period covered by the annual average.

2. All samples taken and analyzed under the provisions of the monitoring plan must be included in determining compliance, even if that number is greater than the minimum required.

3. If during the first year of monitoring, 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.

What do I have to* REPORT *to the State under the Stage 1 DBPR?

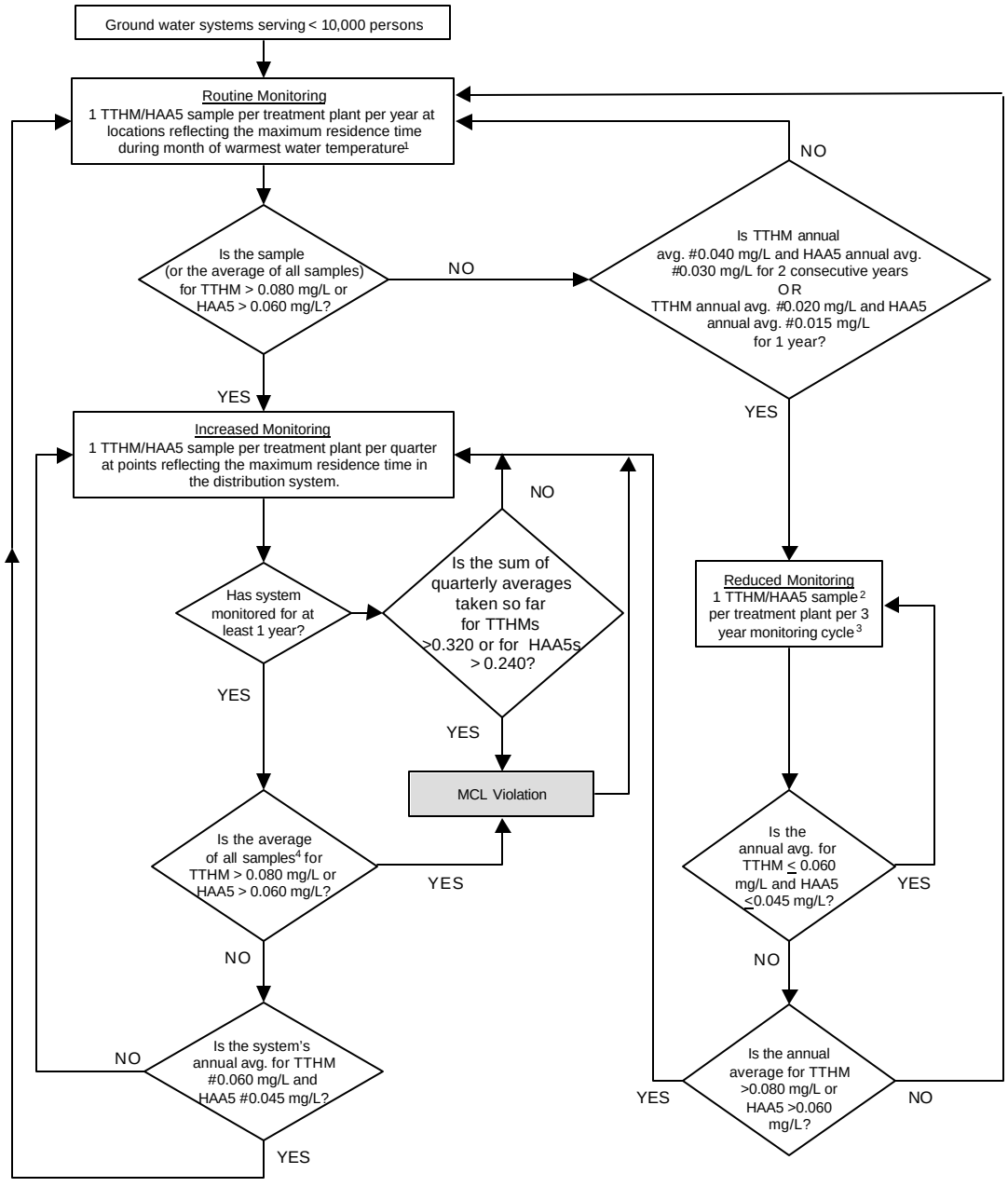
Chemical	What must be reported
TTHM and HAA5	• Number of samples taken during last year • Location, date, result of each sample taken during last year • Arithmetic average of all samples taken over last year • Whether MCL was exceeded *If conducting reduced monitoring:* • Location, date, result of last sample taken • Whether MCL was exceeded
Chlorine and Chloramines	• Number of samples taken during each month of last quarter • Monthly arithmetic average of all samples taken in each month • Arithmetic average of all monthly averages for last 12 months • Whether MRDL was exceeded

NOTES:

1. Systems required to sample quarterly or more frequently must report to the state within 10 days after the end of each quarter in which samples were collected.

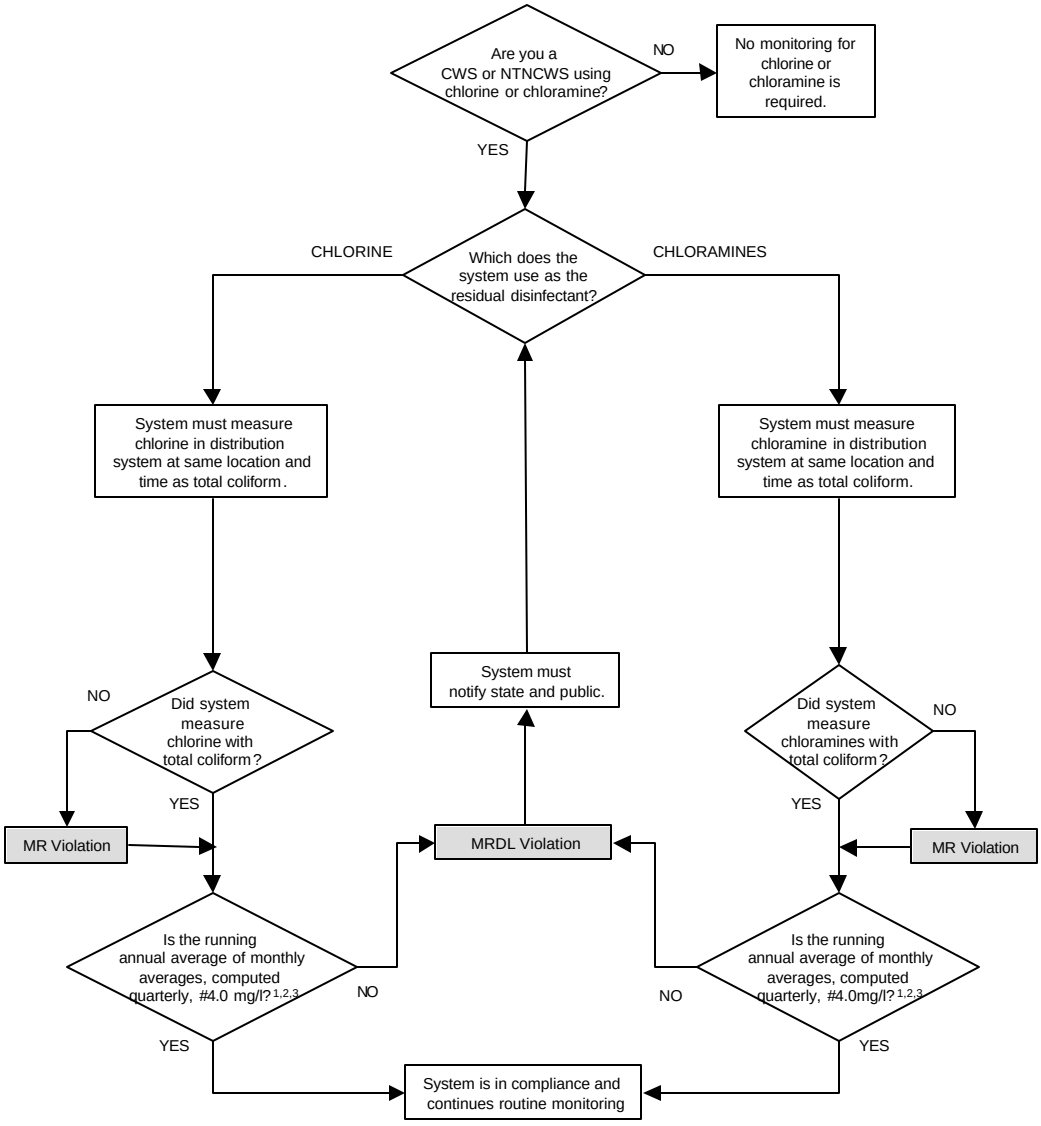
2. Systems required to sample less frequently than quarterly must report to the state within 10 days after the end of each monitoring period in which samples were collected. The state may choose to perform calculations and determine whether the MCL, MRDL, or treatment technique was met in lieu of having the system report that information.

TTHM & HAA5 Monitoring for Ground Water Systems Serving < 10,000 Persons



NOTES
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) Samples must be taken during month of warmest water temperature at location representing the maximum residence time.
3) 3 year cycle begins on January 1 following the quarter in which system qualifies for reduced monitoring.
4) If PWS fails to complete 4 consecutive quarters of monitoring, compliance with the MCL for the last 4 quarter period must be based on average of available data.

Monitoring Requirements for Chlorine and Chloramine



NOTES
1. Notwithstanding the MRDLs for chlorine and chloramines, systems may increase residual disinfectant levels of chlorine or chloramines in the distribution system to a level and for a time necessary to protect publich health to address specific microbiological contamination problems.
2. If system switches between use of chlorine and chloramines, compliance must be determined by including together all monitoring results of both chlorine and chloramines in calculating compliance.
3. Running annual average is first calculated after first 12 months of monitoring.

I operate a treatment plant that uses chlorine dioxide. . .

What* ROUTINE MONITORING *must I conduct under the Stage 1 DBPR?

Chemical	Frequency	Where monitoring must be conducted
Chlorite	Daily	Entrance to the distribution system.
	One 3-sample set per month	Near first customer, location representative of average residence time, location representative of maximum residence time in distribution system.
	Additional: On any day following any daily sample that exceeds 1.0 mg/L, system must take 3 samples	Near first customer, location representative of average residence time, location representative of maximum residence time in distribution system. The system may use results to meet monthly 3-sample set monitoring requirement if the monthly 3-sample set has not yet been taken.
Chlorine Dioxide	Daily	Entrance to the distribution system.
	Additional: For any daily sample that exceeds the MRDL, system must take 3 samples	• For chlorine dioxide, chloramines, or chlorine used to maintain disinfectant residual and **NO** booster chlorination: all samples as close as possible to first customer at intervals of at least 6 hours • If chlorine is used to maintain disinfectant residual **AND** booster chlorination: as close as possible to first customer, location representative of average residence time, as close as possible to end of distribution system

NOTES:
1. Not required for transient noncommunity water systems

What* REDUCED MONITORING *may I conduct under the Stage 1 DBPR?

Chemical	Frequency	Where monitoring must be conducted	Conditions for reduced monitoring
Chlorite (daily)	No reduced monitoring	NA	NA
Chlorite (monthly)	One 3-sample set per quarter	Near first customer, location representative of average residence time, location representative of maximum residence time in distribution system.	• No daily sample has exceeded the MCL • No additional monitoring has been required • No quarterly sample exceeds the MCL
Chlorine Dioxide	No reduced monitoring	NA	NA

NOTES:
1. Not required for transient noncommunity water systems

How do I* DETERMINE IF MY SYSTEM IS IN COMPLIANCE *with the MCLs and MRDLs of the Stage 1 DBPR?

Chemical	Compliance is based on . . .
Chlorite	**Average of 3-sample sets.** • If arithmetic average of any 3-sample set in the month exceeds the MCL, the system is in violation. • The system must notify the public and report to the state if in violation.
Chlorine Dioxide—Acute Violation	**Consecutive daily samples collected.** • If any daily sample taken at entrance to distribution system exceeds 0.8 mg/L, and on the following day 1 or more of the 3 samples taken in the distribution system exceeds 0.8 mg/L, the system is in acute violation. • The system must take immediate corrective action to lower the level of chlorine dioxide below 0.8 mg/L, notify the public and report to the state. • Failure to take samples in the distribution system following an exceedance of the MRDL at the entrance to the distribution system is also an acute violation. System must notify public of acute violation.
Chlorine Dioxide—Nonacute Violation	**Consecutive daily samples collected.** • If any two consecutive daily samples taken at entrance to distribution system exceed 0.8 mg/L, and all distribution system samples are below 0.8 mg/L, the system is in nonacute violation. • The system must take immediate corrective action to lower the level of chlorine dioxide below0.8 mg/L, notify the public and report to the state. • Failure to take samples at the distribution system entrance following an exceedance of the MRDL is also a violation. System must notify public of nonacute violation.

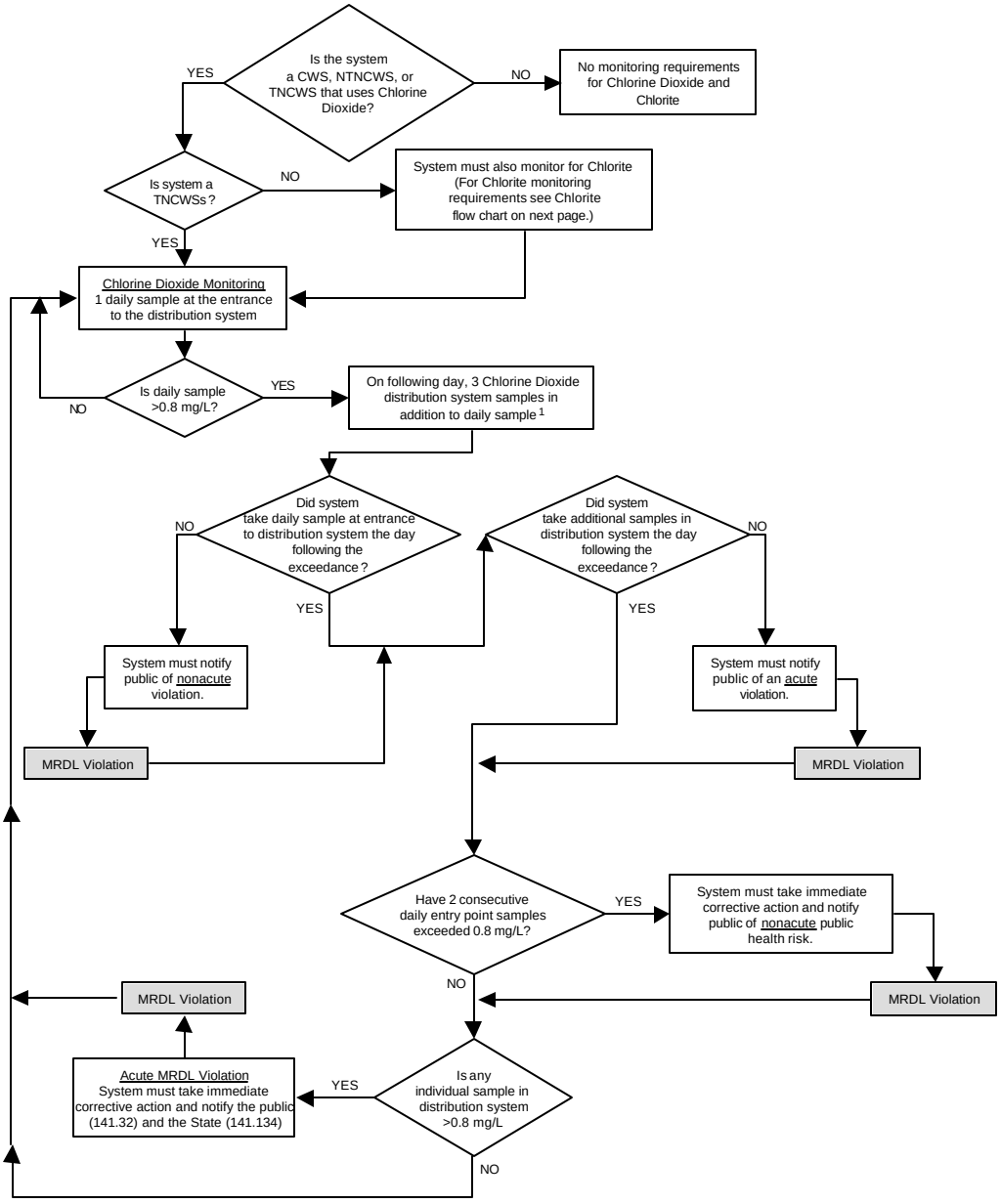
What do I have to* REPORT *to the State under the Stage 1 DBPR?

Chemical	What must be reported
Chlorite	• Number of samples taken each month for last 3 months • Location, date, result of each sample taken during last quarter • For each month in the reporting period, the arithmetic average of all samples taken in the month • Whether MCL was exceed based on 3-sample set average and in which month it was exceeded.
Chlorine Dioxide	• Dates, results, locations of samples taken during last quarter • Whether MRDL was exceeded • Whether MRDL was exceeded in any two consecutive daily samples and whether resulting violation was acute or nonacute

NOTES:

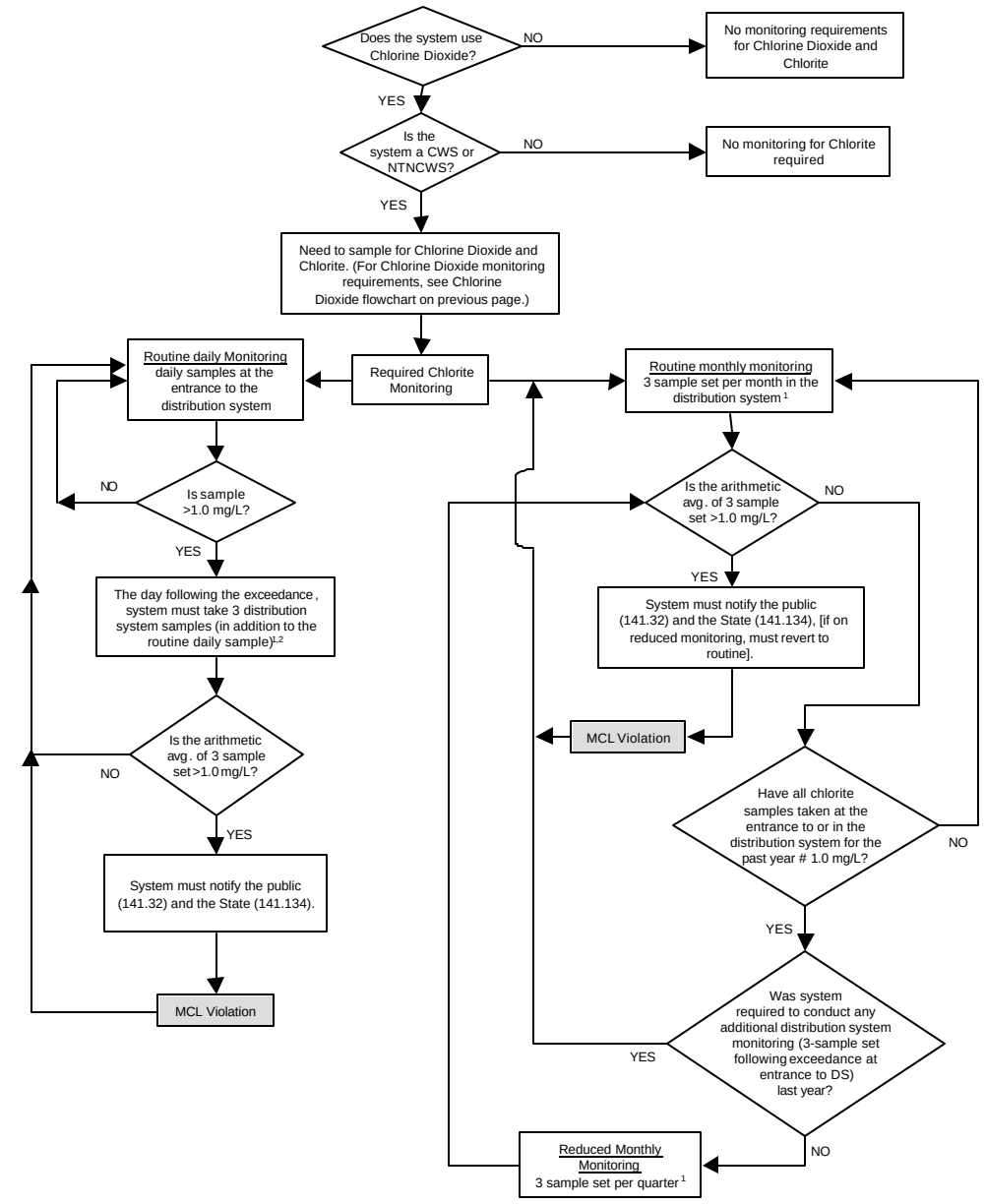
1. Systems required to sample quarterly or more frequently must report to the state within 10 days after the end of each quarter in which samples were collected.

Chlorine Dioxide Monitoring for Systems Using Chlorine Dioxide



NOTES:
1) If chlorine dioxide or chloramines are used to maintain a disinfectant residual in the distribution system (DS), or if chlorine is used to maintain a disinfectant residual in the DS and there are no disinfection addition points (i.e., no booster chlorination) after the entrance to the DS, the system must take 3 samples as close to the first customer as possible, at intervals of at least every 6 hours. If chlorine is used to maintain a disinfectant residual in the DS and there are one or more booster chlorination stations, the system must take one sample as close to the 1st customer as possible, one in a location representative of average residence time, and one as close to the end of the distribution system as possible.

Chlorite Monitoring Requirements for Systems Using Chlorine Dioxide



Note:
1) 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.
2) If the system has not performed the routine monthly sampling for chlorite, they can use this 3 sample set for their monthly chlorite samples.

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I operate a treatment plant that uses ozone . . .

What* ROUTINE MONITORING *must I conduct under the Stage 1 DBPR?

Chemical	Frequency	Where monitoring must be conducted
Bromate	One sample per ozone plant per month	Entrance to the distribution system.
Bromide	One sample per ozone plant per month	In source water (only required if the system wishes to qualify for reduced bromate monitoring).

What* REDUCED MONITORING *may I conduct under the Stage 1 DBPR?

Chemical	Frequency	Where monitoring must be conducted	Conditions for reduced monitoring
Bromate	One sample per ozone plant per quarter	Entrance to the distribution system.	• Annual average source water bromide concentration < 0.05 mg/L
Bromide	No reduced monitoring if wishing to conduct reduced bromate monitoring	NA	NA

NOTES:

1. System must resume monthly bromate monitoring if running annual average of source water bromide $0.05 mg/L.

How do I* DETERMINE IF MY SYSTEM IS IN COMPLIANCE *with the bromate MCL in the Stage 1 DBPR?

Chemical	Compliance is based on . . .
Bromate	**Running annual arithmetic average, computed quarterly, of monthly samples (or average of all samples taken during the month if more than 1 sample was collected).** • If average of samples covering any consecutive 4-quarter period exceeds the MCL, the system is in violation. • The system must notify the public and report to the state if in violation.

NOTES:

1. 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 the MCLs or MRDLs, this failure to monitor will be treated as a violation for the entire period covered by the annual average.

2. All samples taken and analyzed under the provisions of the monitoring plan must be included in determining compliance, even if that number is greater than the minimum required.

3. If during the first year of monitoring, 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.

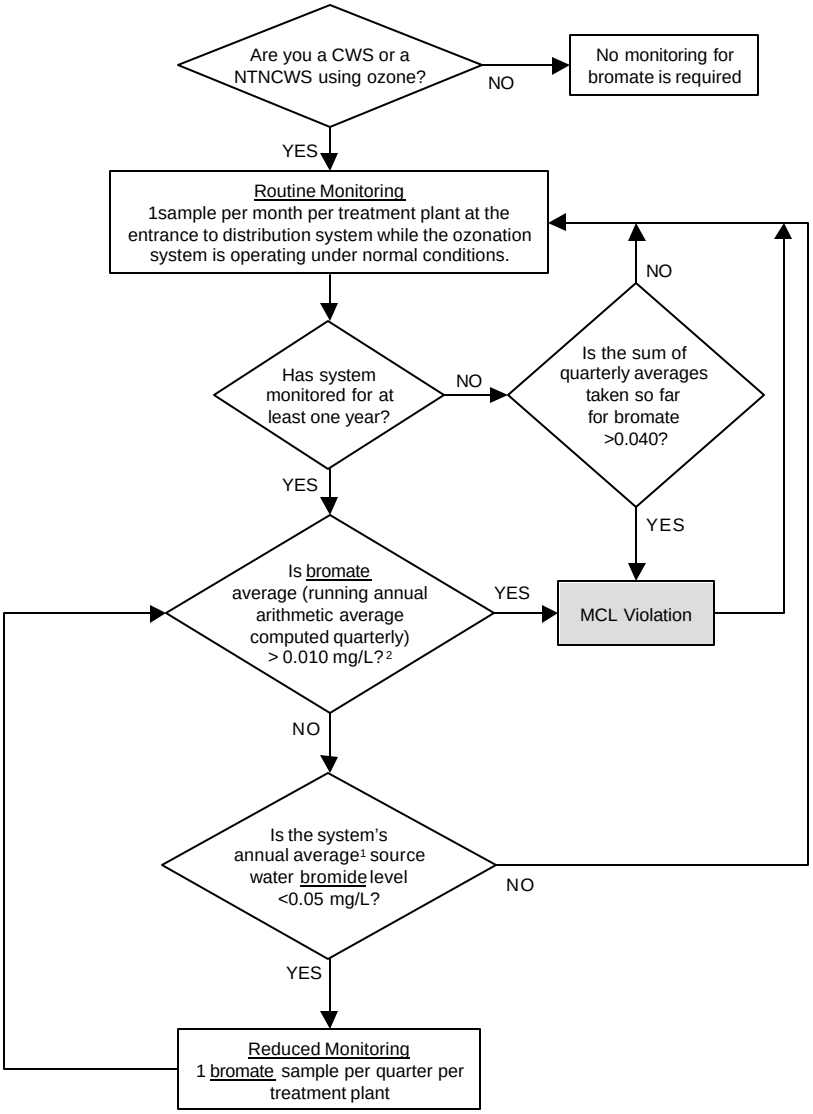
What do I have to* REPORT *to the State under the Stage 1 DBPR?

Chemical	What must be reported
Bromate	• Number of samples taken during last quarter • Location, date, result of each sample taken during last quarter • Arithmetic average of monthly arithmetic averages of all samples taken in last year • Whether MCL was exceeded

NOTES:

1. Systems required to sample quarterly or more frequently must report to the state within 10 days after the end of each quarter in which samples were collected.

Monitoring Requirements for Bromate for Systems using Ozonation



Notes:
1) The average is based upon representative monthly bromide measurements for one year (in months where more than one sample is taken, use the average of all samples taken during the month).
2) If a PWS fails to complete 12 mos of monitoring, compliance must be based on average of available data.

I operate a surface water system or ground water system under the direct influence of surface water and operate a conventional filtration treatment plant . . .

Enhanced Coagulation and Enhanced Precipitative Softening Treatment Technique

What is the goal of enhanced coagulation and enhanced precipitative softening?
The goal of enhanced coagulation and precipitaive softening is to provide additional removal of the natural organic material (referred to as total organic carbon or "TOC") that is a precursor to DBP formation. TOC and disinfectants commonly used in drinking water treatment can combine to form DBPs. Adding additional amounts of coagulant or lime to coagulation or softening treatment trains, respectively, can increase the amount of TOC removed and thereby lower DBP levels in finished water.

Which public water systems does the treatment technique apply to?
The treatment technique applies to Subpart H systems (systems using surface water or groundwater under the direct influence of surface water) that use conventional treatment. Conventional treatment is defined in §141.2 as a series of processes including coagulation, flocculation, sedimentation, and filtration resulting in substantial particulate removal.

How is the treatment technique implemented by public water systems?
Public water systems (PWSs) that use conventional treatment are required to remove a percentage of TOC from the raw water. The percent removal is based on raw water TOC and alkalinity levels. A pair of TOC samples must be taken simultaneously in the raw water and no later than the combined filter effluent at least once per month to calculate the percent removal and demonstrate compliance via a running annual average. PWS unable to meet the required TOC removal may set an alternative TOC percent removal based on jar or pilot testing that reflects the treatability of their water. PWSs may also use one of the alternative compliance criteria to demonstrate compliance.

When is the treatment technique effective?
The treatment technique is effective for systems serving 10,000 or more people in January 2002. The effective date for systems serving under 10,000 people is January 2004.

(Attachment 8) I operate a surface water system or ground water system under the direct influence of surface water and operate a conventional filtration treatment plant . . .

What* ROUTINE MONITORING *must I conduct under the Stage 1 DBPR?

Chemical	Frequency	Where monitoring must be conducted
TOC and Alkalinity (conventional treatment)	One paired TOC sample per plant per month One alkalinity sample per plant per month at same time as source water TOC sample is taken	**TOC (paired samples)** • In source water prior to any treatment • No later than the point of combined filter effluent turbidity monitoring and representative of filtered water **Alkalinity** • Same location as source water TOC sample is taken.

What* REDUCED MONITORING *may I conduct under the Stage 1 DBPR?

Chemical	Frequency	Where monitoring must be conducted	Conditions for reduced monitoring
TOC and Alkalinity (conventional treatment)	One paired TOC sample per plant per quarter One alkalinity sample per plant per quarter at same time as source water TOC sample is taken	**TOC (paired samples)** • In source water prior to any treatment • No later than the point of combined filter effluent turbidity monitoring and representative of filtered water **Alkalinity** • Same location as source water TOC sample is taken.	Average treated water TOC < 2.0 mg/L for 2 consecutive years or <1.0 mg/L for 1 year

(Attachment 8) I operate a surface water system or ground water system under the direct influence of surface water and operate a conventional filtration treatment plant . . .

How do I* DETERMINE IF MY SYSTEM IS IN COMPLIANCE *with the TOC removal requirements of the Stage 1 DBPR?

Chemical	Compliance is based on . . .
TOC (conventional treatment)	"Step 1" or "Step 2" removal targets or alternative compliance criteria (see flowcharts for determining TOC compliance)

NOTES:

1. 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 the treatment technique, 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 the monitoring plan must be included in determining compliance, even if that number is greater than the minimum required.

What do I have to* REPORT *to the State under the Stage 1 DBPR?

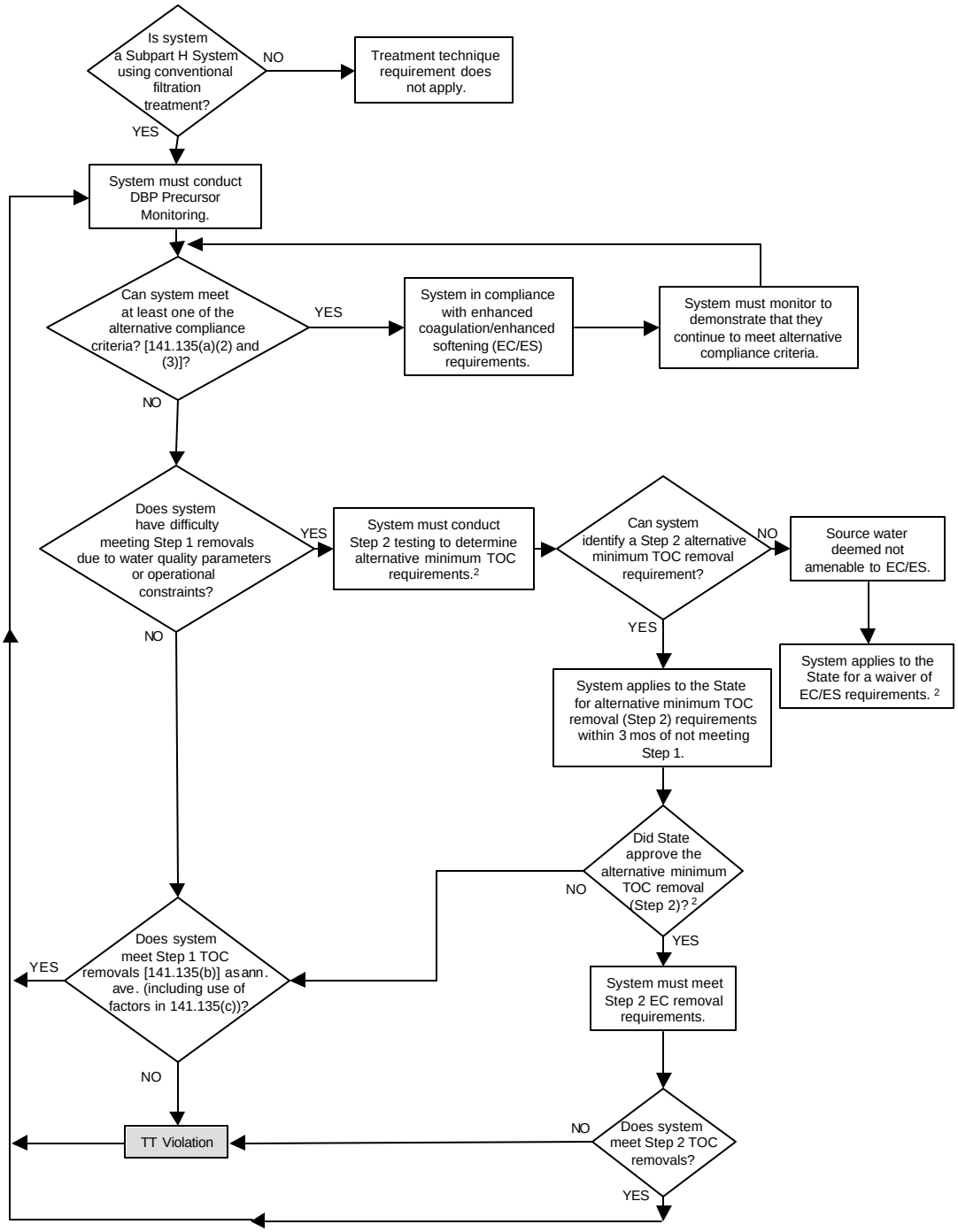
Chemical	What must be reported

TOC and Alkalinity (conventional treatment)	• Number of paired samples taken during last quarter
	• Location, date, result of each paired sample and associated alkalinity taken during last quarter
	• For systems using Step 1 or Step 2, enhanced coagulation or enhanced softening
	  • For each month in the reporting period, the arithmetic average of the percent reduction of TOC for each paired sample and the required TOC percent removal
	  • Calculations for determining compliance with the TOC percent removal requirements
	• For systems using an alternative compliance criterion
	  • Running annual arithmetic average of source water SUVA or treated water SUVA if using this criterion for alternative compliance
	  • Running annual arithmetic average based on monthly average of source or treated water TOC if using this criterion for alternative compliance
	  • Running annual arithmetic average of source water alkalinity or treated water alkalinity if using this criterion for alternative compliance
	  • Running annual average for both TTHM and HAA5 if using this criterion for alternative compliance
	  • Running annual average of amount of magnesium hardness removal if using this criterion for alternative compliance
	  • Whether system is in compliance with particular alternative compliance criterion
	• Whether system is in compliance with the enhanced coagulation or enhanced softening percent removal requirements for the last 4 quarters

NOTES:

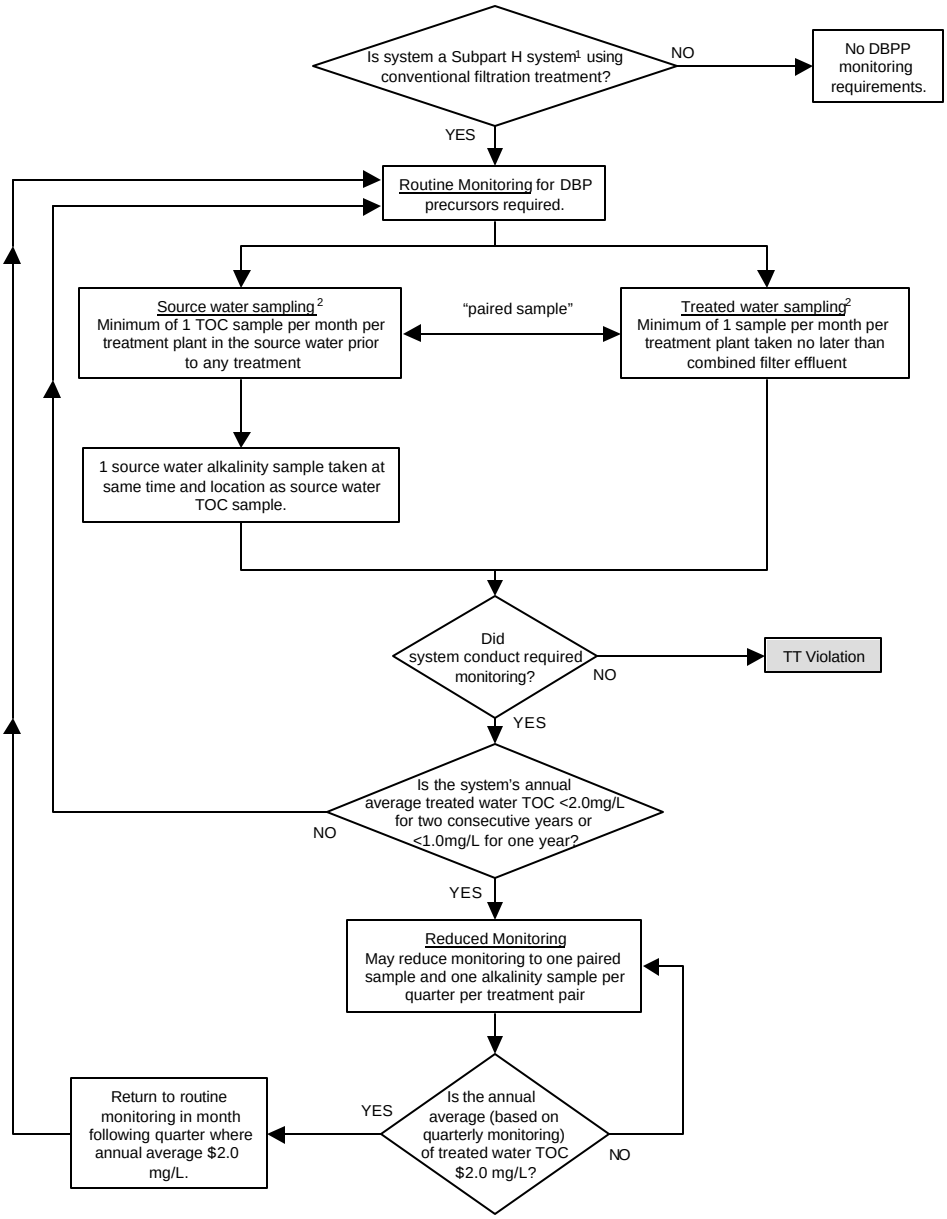
1. Systems required to sample quarterly or more frequently must report to the state within 10 days after the end of each quarter in which samples were collected.

Disinfection Byproducts Precursor Removal
Treatment Technique



Notes:
1) Subpart H = Public water systems using surface water or ground water under the direct influence of surface water.
2) Until the state approves alternate Step 2, system must meet Step 1 removals.

Monitoring Requirements for Disinfection Byproduct Precursors (DBPP)



Notes:
1.) Subpart H = Public water systems using surface water or ground water under the direct influence of surface water.
2.) The source water and the treated water samples are referred to as "paired samples" and are to be taken simultaneously

Appendix E

Stage 1 DPBR Rule Language

This appendix contains the rule language for the Stage 1 DBPR incorporating the technical amendments. Changes to the original rule language are shown as highlighted text. A complete electronic copy of the Stage 1 DBPR, including preamble as published on December 16, 1998, can be found at the EPA web site at www.epa.gov/OGWDW/mdbp/dbpfr.html. A complete electronic copy of the technical amendments for the IESWTR and Stage 1 DBPR, including preamble as published on January 16, 2001, can be found on the EPA website at www.epa.gov/safewater/mdbp/iesfr.html.

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For the reasons set out in the preamble, title 40 chapter I of the Code of Federal Regulations is amended as follows:

PART 9 – [AMENDED]

1. The authority citation for part 9 continues to read as follows:

Authority: 7 U.S.C. 135 et seq., 136-136y; 15 U.S.C. 2001, 2003, 2005, 2006, 2601-2671; 21 U.S.C. 331j, 346a, 348; 31 U.S.C. 9701; 33 U.S.C. 1251 et seq., 1311, 1313d, 1314, 1318, 1321, 1326, 1330, 1342, 1344, 1345 (d) and (e), 1361; E.O. 11735, 38 FR 21243, 3 CFR, 1971-1975 Comp. p. 973; 42 U.S.C. 241, 242b, 243, 246, 300f, 300g, 300g-1, 300g-2, 300g-3, 300g-4, 300g-5, 300g-6, 300j-1, 300j-2, 300j-3, 300j-4, 300j-9, 1857 et seq., 6901-6992k, 7401-7671q, 7542, 9601-9657, 11023, 11048.

2. Section 9.1 is amended by adding the new entries to the table to read as follows:

§9.1 OMB approvals under the Paperwork Reduction Act.

* * * * *

40 CFR Citation	OMB Control No.
* * * * *	
National Primary Drinking Water Regulations	
141.130 – 141.132	*2040-0204*
141.134 – 141.135	*2040-0204*

* * * * *

Part 141 - National Primary Drinking Water Regulations

3. The authority citation for Part 141 continues to read as follows:

Authority: 42 U.S.C. 300f, 300g-1, 300g-2 300g-3, 300g-4, 300g-5, 300g-6, 300j-4, 300j-9, and 300j-11.

4. Section 141.2 is amended by adding the following definitions in alphabetical order to read as follows:

§ 141.2 Definitions.

* * * * *

Enhanced coagulation means the addition of sufficient coagulant for improved removal of disinfection byproduct precursors by conventional filtration treatment.

* * * * *

Enhanced softening means the improved removal of disinfection byproduct precursors by precipitative softening.

* * * * *

GAC10 means 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.

* * * * *

Haloacetic acids (five) (HAA5) mean 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.

* * * * *

Maximum residual disinfectant level (MRDL) means 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 under Section 1412 of the Safe

Drinking Water Act. There is convincing evidence that addition of a disinfectant is necessary for control of waterborne microbial contaminants. Notwithstanding the MRDLs listed in §141.65, 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) means 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.

* * * * *

Subpart H systems means 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 subpart H of this part.

* * * * *

SUVA means Specific Ultraviolet Absorption at 254 nanometers (nm), an indicator of the humic content of a water. It is a calculated parameter obtained by dividing a sample's ultraviolet absorption at a wavelength of 254 nm (UV_{254}) (in $^{-1}$) by its concentration of dissolved organic carbon (DOC) (in mg/L).

* * * * *

Total Organic Carbon (TOC) means 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.

* * * * *

5. Section 141.12 is revised to read as follows:

§141.12 Maximum contaminant levels for total trihalomethanes.

The maximum contaminant level of 0.10 mg/L for total trihalomethanes (the sum of the concentrations of bromodichloromethane, dibromochloromethane, tribromomethane (bromoform), and trichloromethane (chloroform)) applies to subpart H community water systems which serve a population of 10,000 people or more until December 31, 2001. This level applies to community water systems that use only ground water not under the direct influence of surface water and serve a population of 10,000 people or more until December 31, 2003. Compliance with the maximum contaminant level for total trihalomethanes is calculated pursuant to §141.30. After December 31, 2003, this section is no longer applicable.

6. Section141.30 is amended by revising the the first sentences in paragraphs (d) and (f) and adding paragraph (h) to read as follows:

§141.30 Total trihalomethanes sampling, analytical and other requirements.

* * * * *

(d) Compliance with §141.12 shall be determined based on a running annual average of quarterly samples collected by the system as prescribed in paragraph (b)(1) or (2) of this section.

(e) Sampling and analyses made pursuant to this section shall be conducted by one of the total trihalomethanes methods as directed in §141.24(e), and the Technical Notes on Drinking Water Methods, EPA-600/R-94-173, October 1994, which is available from NTIS, PB-104766, or in §141.131(b).

* * * * *

(f) Before a community water system makes any significant modifications to its existing treatment process for the purposes of achieving compliance with §141.12, such system must submit and obtain State approval of a detailed plan setting forth its proposed modification and those safeguards that it will implement to ensure that the bacteriological quality of the drinking water served by such system will not be adversely affected by such modification. ***

* * * * *

(h) The requirements in paragraphs (a) - (g) of this section apply to subpart H community water systems which serve a population of 10,000 or more until December 31, 2001. The requirements in paragraphs (a)

through (g) of this section apply to community water systems which use only ground water not under the direct influence of surface water that add a disinfectant (oxidant) in any part of the treatment process and serve a population of 10,000 or more until December 31, 2003. After December 31, 2003, this section is no longer applicable.

7. Section 141.32 is amended by revising the heading in paragraph (a) introductory text, the first sentence of paragraph (a)(1)(iii) introductory text, the first sentence of paragraph (c) introductory text, the first sentence of paragraph (e) introductory text, and adding paragraphs (a)(1)(iii)(E) and (e)(76) through (81), to read as follows:

Section 141.32 - Public notification.

* * * * *

(a) Maximum Contaminant Levels (MCLs), Maximum Residual Disinfectant Levels (MRDLs). ***

(1) ***

(iii) For violations of the MCLs of contaminants or MRDLs of disinfectants that may pose an acute risk to human health, by furnishing a copy of the notice to the radio and television stations serving the area served by the public water system as soon as possible but in no case later than 72 hours after the violation. ***

* * * * *

(E) Violation of the MRDL for chlorine dioxide as defined in §141.65 and determined according to §141.133(c)(2).

* * * * *

(c) *** The owner or operator of a community water system must give a copy of the most recent public notice for any outstanding violation of any maximum contaminant level, or any maximum residual disinfectant level, or any treatment technique requirement, or any variance or exemption schedule to all new billing units or new hookups prior to or at the time service begins.

* * * * *

(e) ***

(76) Chlorine. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that chlorine is a health concern at certain levels of exposure. Chlorine is added to drinking water as a disinfectant to kill bacteria and other disease-causing microorganisms and is also added to provide continuous disinfection throughout the distribution system. Disinfection is required for surface water systems. However, at high doses for extended periods of time, chlorine has been shown to affect blood and the liver in laboratory animals. EPA has set a drinking water standard for chlorine to protect against the risk of these adverse effects. Drinking water which meets this EPA standard is associated with little to none of this risk and should be considered safe with respect to chlorine.

(77) Chloramines. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that chloramines are a health concern at certain levels of exposure. Chloramines are added to drinking water as a disinfectant to kill bacteria and other disease-causing microorganisms and are also added to provide continuous disinfection throughout the distribution system. Disinfection is required for surface water systems. However, at high doses for extended periods of time, chloramines have been shown to affect blood and the liver in laboratory animals. EPA has set a drinking water standard for chloramines to protect against the risk of these adverse effects. Drinking water which meets this EPA standard is associated with little to none of this risk and should be considered safe with respect to chloramines.

(78) Chlorine Dioxide. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that chlorine dioxide is a health concern at certain levels of exposure. Chlorine dioxide is used in water treatment to kill bacteria and other disease-causing microorganisms and can be used to control tastes and odors. Disinfection is required for surface water systems. However, at high doses, chlorine dioxide-treated drinking water has been shown to affect blood in laboratory animals. Also, high levels of chlorine dioxide given to laboratory animals in drinking water have been shown to cause neurological effects on the developing nervous system. These neurodevelopmental effects may occur as a result of a short-term excessive chlorine dioxide exposure. To protect against such potentially harmful

exposures, EPA requires chlorine dioxide monitoring at the treatment plant, where disinfection occurs, and at representative points in the distribution system serving water users. EPA has set a drinking water standard for chlorine dioxide to protect against the risk of these adverse effects. **[In addition to the language in this introductory text of paragraph (e)(78), systems must include either the language paragraph (e)(78)(i) or (e)(78)(ii) of this section. Systems with a violation at the treatment plant, but not in the distribution system, are required to use the language in paragraph (e)(78)(i) of this section and treat the violation as a nonacute violation. Systems with a violation in the distribution system are required to use the language in paragraph (e)(78)(ii) of this section and treat the violation as an acute violation.]**

(i) The chlorine dioxide violations reported today are the result of exceedances at the treatment facility only, and do not include violations within the distribution system serving users of this water supply. Continued compliance with chlorine dioxide levels within the distribution system minimizes the potential risk of these violations to present consumers.

(ii) The chlorine dioxide violations reported today include exceedances of the EPA standard within the distribution system serving water users. Violations of the chlorine dioxide standard within the distribution system may harm human health based on short-term exposures. Certain groups, including pregnant women, infants, and young children, may be especially susceptible to adverse effects of excessive exposure to chlorine dioxide-treated water. The purpose of this notice is to advise that such persons should consider reducing their risk of adverse effects from these chlorine dioxide violations by seeking alternate sources of water for human consumption until such exceedances are rectified. Local and State health authorities are the best sources for information concerning alternate drinking water.

(79) Disinfection Byproducts and Treatment technique for DBPs. The United States Environmental Protection Agency (EPA) sets drinking water standards and requires the disinfection of drinking water. However, when used in the treatment of drinking water, disinfectants react with naturally-occurring organic and inorganic matter present in water to form chemicals called disinfection byproducts (DBPs). EPA has determined that a number of DBPs are a health concern at certain levels of exposure. Certain DBPs, including some trihalomethanes (THMs) and some haloacetic acids (HAAs), have been shown to cause cancer in laboratory animals. Other DBPs have been shown to affect the liver and the nervous system, and cause reproductive or developmental effects in laboratory animals. Exposure to certain DBPs may produce similar effects in people. EPA has set standards to limit exposure to THMs, HAAs, and other DBPs.

(80) Bromate. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that bromate is a health concern at certain levels of exposure. Bromate is formed as a byproduct of ozone disinfection of drinking water. Ozone reacts with naturally occurring bromide in the water to form bromate. Bromate has been shown to produce cancer in rats. EPA has set a drinking water standard to limit exposure to bromate.

(81) Chlorite. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that chlorite is a health concern at certain levels of exposure. Chlorite is formed from the breakdown of chlorine dioxide, a drinking water disinfectant. Chlorite in drinking water has been shown to affect blood and the developing nervous system. EPA has set a drinking water standard for chlorite to protect against these effects. Drinking water which meets this standard is associated with little to none of these risks and should be considered safe with respect to chlorite.

* * * * *

8. Subpart F is amended by revising the subpart title and adding §§141.53 and 141.54 to read as follows:

SUBPART F - MAXIMUM CONTAMINANT LEVEL GOALS AND MAXIMUM RESIDUAL DISINFECTANT LEVEL GOALS

* * * * *

§141.53 - Maximum contaminant level goals for disinfection byproducts.

MCLGs for the following disinfection byproducts are as indicated:

Disinfection byproduct	MCLG(mg/L)
Bromodichloromethane	Zero
Bromoform	Zero

Bromate	Zero
Dichloroacetic acid	Zero
Trichloroacetic acid	0.3
Chlorite	0.8
Dibromochloromethane	0.06

§141.54 - Maximum residual disinfectant level goals for disinfectants.

MRDLGs for disinfectants are as follows:

Disinfectant Residual	MRDLG(mg/L)
Chlorine	4 (as Cl_2)
Chloramines	4 (as Cl_2)
Chlorine dioxide	0.8 (as ClO_2)

9. Subpart G, Maximum Contaminant Levels, is amended by revising the subpart heading and adding §§141.64 and 141.65 to read as follows:

SUBPART G - NATIONAL REVISED PRIMARY DRINKING WATER REGULATIONS: MAXIMUM CONTAMINANT LEVELS AND MAXIMUM RESIDUAL DISINFECTANT LEVELS

* * * * *

Section 141.64 - Maximum contaminant levels for disinfection byproducts.

(a) The maximum contaminant levels (MCLs) for disinfection byproducts are as follows:

Disinfection byproduct	MCL (mg/L)
Total trihalomethanes (TTHM)	0.080
Haloacetic acids (five) (HAA5)	0.060
Bromate	0.010
Chlorite	1.0

(b) Compliance Dates.

(1) CWSs and NTNCWSs. Subpart H systems serving 10,000 or more persons must comply with this section beginning January 1, 2002. Subpart H systems serving fewer than 10,000 persons and systems using only ground water not under the direct influence of surface water must comply with this section beginning January 1, 2004.

(2) A system that is installing GAC or membrane technology to comply with this section may apply to the State for an extension of up to 24 months past the dates in paragraphs (b)(1) of this section, but not beyond December 31, 2003. In granting the extension, States 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 a National Primary Drinking Water Regulation.

(c) The Administrator, pursuant to Section 1412 of the Act, hereby identifies the following as the best technology, treatment techniques, or other means available for achieving compliance with the maximum contaminant levels for disinfection byproducts identified in paragraph (a) of this section:

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 process to reduce production of bromate.
Chlorite	Control of treatment processes to reduce disinfectant demand and control of disinfection treatment processes to reduce disinfectant levels.

Section 141.65 - Maximum residual disinfectant levels.

(a) Maximum residual disinfectant levels (MRDLs) are as follows:

Disinfectant Residual	MRDL (mg/L)
Chlorine	4.0 (as Cl_2).
Chloramines	4.0 (as Cl_2).
Chlorine dioxide	0.8 (as ClO_2).

(b) Compliance dates.

(1) CWSs and NTNCWSs. Subpart H systems serving 10,000 or more persons must comply with this section beginning January 1, 2002. Subpart H systems serving fewer than 10,000 persons and systems using only ground water not under the direct influence of surface water must comply with this subpart beginning January 1, 2004.

(2) Transient NCWSs. Subpart H 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. Subpart H systems serving fewer than 10,000 persons and using chlorine dioxide as a disinfectant or oxidant and 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 Section 1412 of the Act, hereby identifies the following as the best technology, treatment techniques, or other means available for achieving compliance with the maximum residual disinfectant levels identified in paragraph (a) of this section: control of treatment processes to reduce disinfectant demand and control of disinfection treatment processes to reduce disinfectant levels.

10. A new subpart L is added to read as follows:

SUBPART L - Disinfectant Residuals, Disinfection Byproducts, and Disinfection Byproduct Precursors

Sec.

141.130 General requirements.
141.131 Analytical requirements.
141.132 Monitoring requirements.
141.133 Compliance.
141.134 Reporting and recordkeeping requirements.
141.135 Treatment technique for control of disinfection byproduct (DBP) precursors.

§141.130 General requirements.

(a) The requirements of this Subpart L constitute national primary drinking water regulations.

(1) The regulations in this subpart establish criteria under which community water systems (CWSs) and nontransient, noncommunity water systems (NTNCWSs) which 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 §§141.64 and 141.65, respectively, and must meet the treatment technique requirements for disinfection byproduct precursors in §141.135.

(2) The regulations in this subpart establish criteria under which transient NCWSs that use chlorine dioxide as a disinfectant or oxidant must modify their practices to meet the MRDL for chlorine dioxide in §141.65.

(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.

(b) Compliance dates. (1) CWSs and NTNCWSs. Unless otherwise noted, systems must comply with the requirements of this subpart as follows. Subpart H systems serving 10,000 or more persons must comply with this subpart beginning January 1, 2002. Subpart H systems serving fewer than 10,000 persons and systems using only ground water not under the direct influence of surface water must comply with this subpart beginning January 1, 2004.

(2) Transient NCWSs. Subpart H systems serving 10,000 or more persons and using chlorine dioxide as a disinfectant or oxidant must comply with any requirements for chlorine dioxide ~~and chlorite~~ in this subpart beginning January 1, 2002. Subpart H systems serving fewer than 10,000 persons and using chlorine dioxide as a disinfectant or oxidant and 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 any requirements for chlorine dioxide ~~and chlorite~~ in this subpart beginning January 1, 2004.

(c) Each CWS and NTNCWS regulated under paragraph (a) of this section must be operated by qualified personnel who meet the requirements specified by the State and are included in a State register of qualified operators.

(d) Control of Disinfectant Residuals. Notwithstanding the MRDLs in §141.65, 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.

§141.131 Analytical requirements.

(a) General. (1) Systems must use only the analytical method(s) specified in this section, or otherwise approved by EPA for monitoring under this subpart, to demonstrate compliance with the requirements of this subpart. These methods are effective for compliance February 16, 1999.

(2) The following documents are incorporated by reference. The Director of the Federal Register approves this incorporation by reference in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. 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. 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 the Determination of Inorganic Substances in Environmental Samples, USEPA, August 1993, EPA/600/R-93/100. (available through NTIS, PB94-121811). EPA Method 300.1 is titled USEPA Method 300.1, Determination of Inorganic Anions in Drinking Water by Ion Chromatography, Revision 1.0, USEPA, 1997, EPA/600/R-98/118 (available through NTIS, PB98-169196); also available from: Chemical Exposure Research Branch, Microbiological & Chemical Exposure Assessment Research Division, National Exposure Research Laboratory, U.S. Environmental Protection Agency, Cincinnati, OH 45268, Fax Number: 513-569-7757, Phone number: 513-569-7586. 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 Edition, American Public Health Association, 1995; copies may be obtained from the American Public Health Association, 1015 Fifteenth Street, NW, Washington, DC 20005. Standard Methods 5310 B, 5310 C, and 5310 D shall be followed in accordance with the Supplement to the 19th Edition of Standard Methods for the Examination of Water and Wastewater, American Public Health Association, 1996; copies may be obtained from the American Public Health Association, 1015 Fifteenth Street, NW, Washington, DC 20005. ASTM Method

D 1253-86 shall be followed in accordance with the Annual Book of ASTM Standards, Volume 11.01, American Society for Testing and Materials, 1996 edition; copies may be obtained from the American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohoken, PA 19428.

(b) Disinfection Byproducts. (1) Systems must measure disinfection byproducts by the methods (as modified by the footnotes) listed in the following table:

APPROVED METHODS FOR DISINFECTION BYPRODUCT COMPLIANCE MONITORING

			BYPRODUCT MEASURED[1]			
METHODOLOGY[2]	**EPA METHOD**	**STANDARD METHOD**	**TTHM**	**HAA5**	**CHLORITE[4]**	**BROMATE**
P&T/GC/ElCD & PID	502.2[3]		**X**			
P&T/GC/MS	524.2		**X**			
LLE/GC/ECD	551.1		**X**			
LLE/GC/ECD		6251 B		**X**		
SPE/GC/ECD	552.1			**X**		
LLE/GC/ECD	552.2			**X**		
Amperometric Titration		4500-ClO_2 E			**X**	
IC	300.0				**X**	
IC	300.1				**X**	**X**

[1]-**X** indicates method is approved for measuring specified disinfection byproduct.
[2]-P&T = purge and trap; GC = gas chromatography; ElCD = electrolytic conductivity detector; PID = photoionization detector; MS = mass spectrometer; LLE = liquid/liquid extraction; ECD = electron capture detector; SPE = solid phase extractor; IC = ion chromatography.
[3]-If TTHMs are the only analytes being measured in the sample, then a PID is not required.
[4]-Amperometric titration may be used for routine daily monitoring of chlorite at the entrance to the distribution system, as prescribed in §141.132(b)(2)(i)(A). Ion chromatography must be used for routine monthly monitoring of chlorite and additional monitoring of chlorite in the distribution system, as prescribed in §141.132(b)(2)(i)(B) and (b)(2)(ii).

(2) Analysis under this section for disinfection byproducts must be conducted by laboratories that have received certification by EPA or the State, except as specified under paragraph (b)(3) of this section. To receive certification to conduct analyses for the contaminants in §141.64(a), the laboratory must carry out annual analyses of performance evaluation (PE) samples approved by EPA or the State. 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 data between a maximum and minimum acceptance limit of +/- 50% and +/- 15% of the study mean.

(3) A party approved by EPA or the State 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:

APPROVED METHODS FOR DISINFECTANT RESIDUAL COMPLIANCE MONITORING

			Residual Measured[1]			
Methodology	**Standard Method**	**ASTM Method**	**Free Chlorine**	**Combined Chlorine**	**Total Chlorine**	**Chlorine Dioxide**
Amperometric Titration	4500-Cl D,	D 1253-86	**X**	**X**	**X**	
Low Level Amperometric Titration	4500-Cl E				**X**	
DPD Ferrous Titrimetric	4500-Cl F		**X**	**X**	**X**	
DPD Colorimetric	4500-Cl G		**X**	**X**	**X**	
Syringaldazine (FACTS)	4500-Cl H		**X**			
Iodometric Electrode	4500-Cl I				**X**	
DPD	4500-ClO_2 D					**X**
Amperometric Method II	4500-ClO_2 E					**X**

[1]-**X** indicates method is approved for measuring specified disinfectant residual.

(2) If approved by the State, 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 the State 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 the State must measure these parameters.

(1) Alkalinity. All methods allowed in §141.89(a) for measuring alkalinity.

(2) Bromide. EPA Method 300.0 or EPA Method 300.1.

(3) Total Organic Carbon (TOC). Standard Method 5310 B (High-Temperature Combustion Method) or Standard Method 5310 C (Persulfate-Ultraviolet or Heated-Persulfate Oxidation Method) or Standard Method 5310 D (Wet-Oxidation Method). TOC samples may not be filtered prior to analysis. TOC samples must either be analyzed or must be acidified to achieve pH less than 2.0 by minimal addition of phosphoric or sulfuric acid as soon as practical after sampling, not to exceed 24 hours. 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.

(i) Dissolved Organic Carbon (DOC). Standard Method 5310 B (High-Temperature Combustion Method) or Standard Method 5310 C (Persulfate-Ultraviolet or Heated-Persulfate Oxidation Method) or Standard Method 5310 D (Wet-Oxidation Method). Prior to analysis, DOC samples must be filtered

through a 0.45 µm pore-diameter filter. 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 < 0.5 mg/L. DOC samples must be filtered through the 0.45 µm pore-diameter filter prior to acidification. DOC samples must either be analyzed or must be acidified to achieve pH less than 2.0 by minimal addition of phosphoric or sulfuric acid as soon as practical after sampling, not to exceed 48 hours. Acidified DOC samples must be analyzed within 28 days.

(ii) Ultraviolet Absorption at 254 nm (UV_{254}). Method 5910 B (Ultraviolet Absorption Method). 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 §141.23(k)(1) for measuring pH.

§141.132 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 State approval in accordance with criteria developed under §142.16(h)(5) of this chapter.

(3) Failure to monitor in accordance with the monitoring plan required under paragraph (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 subpart or subpart M to qualify for reduced monitoring.

(b) Monitoring requirements for disinfection byproducts.

(1) TTHMs and HAA5. (i) Routine monitoring. Systems must monitor at the frequency indicated in the following table:

ROUTINE MONITORING FREQUENCY FOR TTHM AND HAA5

Type of system	Minimum Monitoring Frequency	Sample Location in the distribution system
Subpart H 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].
Subpart H system serving from 500 to 9,999 persons	one water sample per quarter per treatment plant	Locations representing maximum residence time[1].
Subpart H 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 the MCL, the 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 the system meets reduced monitoring criteria in paragraph (b)(1)(iv) 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, the 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 the system meets criteria in paragraph (b)(1)(iv) 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 State approval in accordance with criteria developed under §142.16(h)(5) of this chapter.

(ii) Systems may reduce monitoring, except as otherwise provided, in accordance with the following table:

REDUCED MONITORING FREQUENCY FOR TTHM AND HAA5

IF YOU ARE A...	YOU MAY REDUCE MONITORING IF YOU HAVE MONITORED AT LEAST ONE YEAR AND YOUR...	TO THIS LEVEL
Subpart H system serving at least 10,000 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 #0.030mg/L	one sample per treatment plant per quarter at distribution system location reflecting maximum residence time
Subpart H 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 #0.030mg/L	one sample per treatment plant per year at distribution system location reflecting maximum residence time during month of warmest water temperature. NOTE: Any Subpart H 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 #0.030mg/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 #0.030mg/L for two consecutive years OR TTHM annual average #0.020 mg/L and HAA5 annual average #0.015mg/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.

(iii) 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 0.060 mg/L and 0.045 mg/L for TTHMs and HAA5, respectively. Systems that do not meet these levels must resume monitoring at the frequency identified in paragraph (b)(1)(i) of this section (minimum frequency column) in the quarter immediately following the monitoring period in which the system exceeds 0.060 mg/L or 0.045 mg/L for TTHM orHAA5, 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 >0.080 mg/L or the HAA5 annual average is >0.060 mg/L, the system must go to the increased monitoring identified in paragraph (b)(1)(i) of this section (sample location column) in the quarter immediately following the monitoring period in which the system exceeds 0.080 mg/L or 0.060 mg/L for TTHMs or HAA5 respectively.

(iv) 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.

(v) The State may return a system to routine monitoring at the State's discretion.

(2) Chlorite. Community and nontransient noncommunity water systems using chlorine dioxide, for disinfection or oxidation, must conduct monitoring for chlorite.

(i) Routine monitoring. (A) 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 paragraph (b)(2)(ii) of this section, in addition to the sample required at the entrance to the distribution system.

(B) 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 paragraph (b)(2)(ii) of this section to meet the requirement for monitoring in this paragraph.

(ii) 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).

(iii) Reduced monitoring. (A) Chlorite monitoring at the entrance to the distribution system required by paragraph (b)(2)(i)(A) of this section may not be reduced.

(B) Chlorite monitoring in the distribution system required by paragraph (b)(2)(i)(B) 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 paragraph (b)(2)(i)(B) of this section has exceeded the chlorite MCL and the system has not been required to conduct monitoring under paragraph (b)(2)(ii) of this section. The system may remain on the reduced monitoring schedule until either any of the three individual chlorite samples taken monthly in the distribution system under paragraph (b)(2)(i)(B) of this section exceeds the chlorite MCL or the system is required to conduct monitoring under paragraph (b)(2)(ii) of this section, at which time the system must revert to routine monitoring.

(3) Bromate. (i) Routine monitoring. Community and nontransient noncommunity 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.

(ii) Reduced monitoring. Systems required to analyze for bromate may reduce 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 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 paragraph (b)(3)(i) of this section.

(c) Monitoring requirements for disinfectant residuals.

(1) Chlorine and chloramines. (i) Routine monitoring. Community and nontransient noncommunity water systems that use chlorine or chloramines must measure the residual disinfectant level in distribution system when total coliforms are sampled, as specified in §141.21. Subpart H systems may use the results of residual disinfectant concentration sampling conducted under §141.74(b)(6)(i) for unfiltered systems or §141.74(c)(3)(i) for systems which filter, in lieu of taking separate samples.

(ii) Reduced monitoring. Monitoring may not be reduced.

(2) Chlorine Dioxide. (i) Routine monitoring. Community, nontransient noncommunity, and transient noncommunity water 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 paragraph (c)(2)(ii) of this section, in addition to the sample required at the entrance to the distribution system.

(ii) Additional monitoring. On each day following a routine sample monitoring result that exceeds the MRDL, the system is required to take three 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 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).

(iii) Reduced monitoring. Chlorine dioxide monitoring may not be reduced.

(d) Monitoring requirements for disinfection byproduct precursors (DBPP).

(1) Routine monitoring. Subpart H systems which use conventional filtration treatment (as defined in §141.2) must monitor each treatment plant for 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 paragraph (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. Subpart H 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 $\geq$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 subpart must develop and implement a monitoring plan. The system must maintain the plan and make it available for inspection by the State and the general public no later than 30 days following the applicable compliance dates in §141.130(b). All Subpart H systems serving more than 3300 people must submit a copy of the monitoring plan to the State no later than the date of the first report required under §141.134. The State may also require the plan to be submitted by any other system. After review, the State 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 subpart.

(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 of §141.29, the sampling plan must reflect the entire distribution system.

§141.133 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 subpart 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 §141.132, 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. (i) For systems monitoring quarterly, compliance with MCLs in §141.64 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 §141.132(b)(1).

(ii) For systems monitoring less frequently than quarterly, systems demonstrate MCL compliance if the average of samples taken that year under the provisions of §141.132(b)(1) does not exceed the MCLs in §141.64. 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 result 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.

(iii) 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 §141.32 or §141.32, whichever is effective for your system, in addition to reporting to the State pursuant to §141.134.

(iv) If a PWS fails to complete four consecutive quarters of monitoring, compliance with the MCL for the last four-quarter compliance 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 §141.132(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 §141.32, in addition to reporting to the State pursuant to §141.134. If a PWS 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 §141.132(b)(2)(i)(B) and §141.132(b)(2)(ii). If the arithmetic average of any three sample sets exceeds the MCL, the system is in violation of the MCL and must notify the public pursuant to subpart Q, in addition to reporting to the State pursuant to §141.134.

(c) Disinfectant residuals.

(1) Chlorine and chloramines. (i) Compliance must be based on a running annual arithmetic average, computed quarterly, of monthly averages of all samples collected by the system under §141.132(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 §141.32, in addition to reporting to the State pursuant to §141.134.

(ii) 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 §141.134 must clearly indicate which residual disinfectant was analyzed for each sample.

(2) Chlorine dioxide. (i) Acute violations. Compliance must be based on consecutive daily samples collected by the system under §141.132(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 subpart Q. 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 subpart Q in addition to reporting the State pursuant to §141.134.

(ii) Nonacute violations. Compliance must be based on consecutive daily samples collected by the system under §141.132(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 subpart Q in addition to reporting the State pursuant to §141.134. 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 §141.32(e)(78) in addition to reporting the State pursuant to §141.134.

(d) Disinfection Byproduct Precursors (DBPP). Compliance must be determined as specified by §141.135(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 §141.135(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 §141.135(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 §141.135(c)(1)(iv) is less than 1.00, the system is in violation of the treatment technique requirements and must notify the public pursuant to §141.32, in addition to reporting to the State pursuant to §141.134.

§141.134 Reporting and recordkeeping requirements.

(a) Systems required to sample quarterly or more frequently must report to the State within 10 days after the end of each quarter in which samples were collected, notwithstanding the provisions of §141.31. Systems required to sample less frequently than quarterly must report to the State 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:

IF YOU ARE A...	YOU MUST REPORT...[1]
(1) System monitoring for TTHMs and HAA5 under the requirements of §141.132(b) on a quarterly or more frequent basis.	(i) The number of samples taken during the last quarter. (ii) The location, date, and result of each sample taken during the last quarter. (iii) The arithmetic average of all samples taken in the last quarter. (iv) The annual arithmetic average of the quarterly arithmetic averages of this section for the last four quarters. (V) Whether, based on §141.133(b)(1), the MCL was violated.
(2) System monitoring for TTHMs and HAA5 under the requirements of §141.132(b) less frequently than quarterly (but at least annually).	(i) The number of samples taken during the last year. (ii) The location, date, and result of each sample taken during the last monitoring period. (iii) The arithmetic average of all samples taken over the last year. (iv) Whether, based on §141.133(b)(1), the MCL was violated.
(3) System monitoring for TTHMs and HAA5 under the requirements of §141.132(b) less frequently than annually.	(i) The location, date, and result of the last sample taken. (ii) Whether, based on §141.133(b)(1), the MCL was violated.
(4) System monitoring for chlorite under the requirements of §141.132(b).	(i) The number of entry point samples taken each month for the last 3 months. (ii) The location, date, and result of each sample (both entry point and distribution system) taken during the last quarter. (iii) For each month in the reporting period, the arithmetic average of all samples taken in each three sample set taken in the distribution system. (4) Whether, based on §141.133(b)(3), the MCL was violated, and in which month, and how many times it was violated each month.
(5) System monitoring for bromate under the requirements of §141.132(b)	(i) The number of samples taken during the last quarter. (ii) The location, date, and result of each sample taken during the last quarter. (iii) The arithmetic average of the monthly arithmetic averages of all samples taken in the last year. (iv) Whether, based on §141.133(b)(2), the MCL was violated.

[1] The State 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:

IF YOU ARE A...	**YOU MUST REPORT...[1]**
System monitoring for chlorine or chloramines under the requirements of §141.132(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 all monthly averages for the last 12 months. (4) Whether, based on §141.133(c)(1), the MRDL was violated.
System monitoring for chlorine dioxide under the requirements of §141.132(c)	(1) The dates, results, and locations of samples taken during the last quarter. (2) Whether, based on §141.133(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 State 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:

IF YOU ARE A...	YOU MUST REPORT...[1]
System monitoring monthly or quarterly for TOC under the requirements of §141.132(d) and required to meet the enhanced coagulation or enhanced softening requirements in §141.135(b)(2) or (3)	(1) The number of paired (source water and treated water) samples taken during the last quarter. (2) The location, date, and results 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 §141.135(c)(1). (5) Whether the system is in compliance with the enhanced coagulation or enhanced softening percent removal requirements in §141.135(b) for the last four quarters.
System monitoring monthly or quarterly for TOC under the requirements of §141.132(d) and meeting one or more of the alternative compliance criteria in §141.135(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 §141.135(a)(2)(i) or (iii) or of treated water TOC for systems meeting the criterion in §141.135(a)(2)(ii). (5) The running annual arithmetic average based on monthly averages (or quarterly samples) of source water SUVA for systems meeting the criterion in §141.135(a)(2)(v) or of treated water SUVA for systems meeting the criterion in §141.135(a)(2)(vi). (6) The running annual average of source water alkalinity for systems meeting the criterion in §141.135(a)(2)(iii) and of treated water alkalinity for systems meeting the criterion in §141.135(a)(3)(i). (7) The running annual average for both TTHM and HAA5 for systems meeting the criterion in §141.135(a)(2)(iii) or (iv). (8) The running annual average of the amount of magnesium hardness removal (as $CaCO_3$, in mg/L) for systems meeting the criterion in §141.135(a)(3)(ii). (9) Whether the system is in compliance with the particular alternative compliance criterion in §141.135(a)(2) or (3).

1. The State may choose to perform calculations and determine whether the treatment technique was met, in lieu of having the system report that information.

§141.135 Treatment technique for control of disinfection byproduct (DBP) precursors.

(a) Applicability. (1) Subpart H systems using conventional filtration treatment (as defined in §141.2) must operate with enhanced coagulation or enhanced softening to achieve the TOC percent removal levels specified in paragraph (b) of this section unless the system meets at least one of the alternative compliance criteria listed in paragraph (a)(2) or (a)(3) of this section.

(2) Alternative compliance criteria for enhanced coagulation and enhanced softening systems. Subpart H systems using conventional filtration treatment may use the alternative compliance criteria in paragraphs (a)(2)(i) through (vi) of this section to comply with this section in lieu of complying with paragraph (b) of this section. Systems must still comply with monitoring requirements in §141.132(d).

(i) The system's source water TOC level, measured according to §141.131(d)(3), is less than 2.0 mg/L, calculated quarterly as a running annual average.

(ii) The system's treated water TOC level, measured according to §141.131(d)(3), is less than 2.0 mg/L, calculated quarterly as a running annual average

(iii) The system's source water TOC level, measured according to §141.131(d)(3), is less than 4.0 mg/L, calculated quarterly as a running annual average; the source water alkalinity, measured according to §141.131(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 §141.130(b), the system has made a clear and irrevocable financial commitment not later than the effective date for compliance in §141.130(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 State for approval not later than the effective date for compliance in §141.130(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 of National Primary Drinking Water Regulations.

(iv) 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.

(v) The system's source water SUVA, prior to any treatment and measured monthly according to §141.131(d)(4), is less than or equal to 2.0 L/mg-m, calculated quarterly as a running annual average.

(vi) The system's finished water SUVA, measured monthly according to §141.131(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 paragraph (b)(2) of this section may use the alternative compliance criteria in paragraphs (a)(3)(i) and (ii) of this section in lieu of complying with paragraph (b) of this section. Systems must still comply with monitoring requirements in §141.132(d).

(i) Softening that results in lowering the treated water alkalinity to less than 60 mg/L (as $CaCO_3$), measured monthly according to §141.131(d)(1) and calculated quarterly as a running annual average.

(ii) Softening that results in removing at least 10 mg/L of magnesium hardness (as $CaCO_3$), measured monthly 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 paragraph (b)(2) of this section between the source water and the combined filter effluent, unless the State approves a system's request for alternate minimum TOC removal (Step 2) requirements under paragraph (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 §141.131(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 Subpart H Systems Using Conventional Treatment[1, 2]

Source-Water TOC, mg/L	Source-Water Alkalinity, mg/L as $CaCO_3$		
	0-60 (percent)	**>60-120 (percent)**	**>120[3] (percent)**
>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 paragraph (a)(2)(i)-(vi) of this section are not required to operate with enhanced coagulation.
[2] Softening systems meeting one of the alternative compliance criteria in paragraph (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) Subpart H conventional treatment systems that cannot achieve the Step 1 TOC removals required by paragraph (b)(2) of this section due to water quality parameters or operational constraints must apply to the State, within three months of failure to achieve the TOC removals required by paragraph (b)(2) of this section, for approval of alternative minimum TOC (Step 2) removal requirements submitted by the system. If the State approves the alternative minimum TOC removal (Step 2) requirements, the State may make those requirements retroactive for the purposes of determining compliance. Until the State approves the alternate minimum TOC removal (Step 2) requirements, the system must meet the Step 1 TOC removals contained in paragraph (b)(2) of this section.

(4) Alternate minimum TOC removal (Step 2) requirements. Applications made to the State by enhanced coagulation systems for approval of alternate minimum TOC removal (Step 2) requirements under paragraph (b)(3) of this section must include, at a minimum, results of bench- or pilot-scale testing conducted under paragraph (b)(4)(i) of this section. The submitted bench- or pilot- scale testing must be used to determine the alternate enhanced coagulation level.

(i) Alternate enhanced coagulation level is defined as:

Coagulation at a coagulant dose and pH as determined by the method described in paragraphs (b)(4)(i) through (v) of this section such that an incremental addition of 10 mg/L of alum (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 State, this minimum requirement supersedes the minimum TOC removal required by the table in paragraph (b)(2) of this section. This requirement will be effective until such time as the State approves a new value based on the results of a new bench- and pilot-scale test. Failure to achieve State-set alternative minimum TOC removal levels is a violation of National Primary Drinking Water Regulations.

(ii) Bench- or pilot-scale testing of enhanced coagulation must be conducted by using representative water samples and adding 10 mg/L increments of alum (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

(iii) 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 (or equivalant addition of iron coagulant) is reached.

(iv) The system may operate at any coagulant dose or pH necessary (consistent with other NPDWRs) to achieve the minimum TOC percent removal approved under paragraph (b)(3) of this section.

(v) 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 equivalant addition of iron coagulant), the water is deemed to contain TOC not amenable to enhanced coagulation. The system may then apply to the State for a waiver of enhanced coagulation requirements.

(c) Compliance Calculations. (1) Subpart H systems other than those identified in paragraphs (a)(2) or (a)(3) of this section must comply with requirements contained in paragraphs (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:

(i) Determine actual monthly TOC percent removal, equal to:

(1 - (treated water TOC/source water TOC)) x 100.

(ii) Determine the required monthly TOC percent removal (from either the table in paragraph (b)(2) of this section or from paragraph (b)(3) of this section).

(iii) Divide the value in paragraph (c)(1)(i) of this section by the value in paragraph (c)(1)(ii) of this section.

(iv) Add together the results of paragraph (c)(1)(iii) of this section for the last 12 months and divide by 12.

(v) If the value calculated in paragraph (c)(1)(iv) 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 paragraphs (c)(2)(i) through (v) of this section in lieu of the calculations in paragraph (c)(1)(i) through (v) of this section to determine compliance with TOC percent removal requirements.

(i) In any month that the system's treated or source water TOC level, measured according to §141.131(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 paragraph (c)(1)(iii) of this section) when calculating compliance under the provisions of paragraph (c)(1) of this section.

(ii) 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 paragraph (c)(1)(iii) of this section) when calculating compliance under the provisions of paragraph (c)(1) of this section.

(iii) In any month that the system's source water SUVA, prior to any treatment and measured according to §141.131(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 paragraph (c)(1)(iii) of this section) when calculating compliance under the provisions of paragraph (c)(1) of this section.

(iv) In any month that the system's finished water SUVA, measured according to §141.131(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 paragraph (c)(1)(iii) of this section) when calculating compliance under the provisions of paragraph (c)(1) of this section.

(v) 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 paragraph (c)(1)(iii) of this section) when calculating compliance under the provisions of paragraph (c)(1) of this section.

(3) Subpart H systems using conventional treatment may also comply with the requirements of this section by meeting the criteria in paragraph (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 Subpart H systems using conventional treatment, enhanced coagulation or enhanced softening.

11. Section 141.154 is amended by adding paragraph (e) to read as follows:

§141.154 Required additional health information.

* * * * *

(e) Community water systems that detect TTHM above 0.080 mg/l, but below the MCL in §141.12, as an annual average, monitored and calculated under the provisions of §141.30, must include health effects language prescribed by paragraph (73) of appendix C to subpart O.

PART 142 -- NATIONAL PRIMARY DRINKING WATER REGULATIONS IMPLEMENTATION

12. The authority citation for Part 142 continues to read as follows:

Authority: 42 U.S.C. 300f, 300g-1, 300g-2 300g-3, 300g-4, 300g-5, 300g-6, 300j-4, 300j-9, and 300j-11.

13. Section 142.14 is amended by adding new paragraphs (d)(12), (d)(13), (d)(14), (d)(15), and (d)(16) to read as follows.

§142.14 Records kept by States.

* * * * *

(d) * * *

(12) Records of the currently applicable or most recent State determinations, including all supporting information and an explanation of the technical basis for each decision, made under the following provisions of 40 CFR part 141, subpart L for the control of disinfectants and disinfection byproducts. These records must also include interim measures toward installation.

(i) States must keep records of systems that are installing GAC or membrane technology in accordance with §141.64(b)(2) of this chapter. These records must include the date by which the system is required to have completed installation.

(ii) States must keep records of systems that are required, by the State, to meet alternative minimum TOC removal requirements or for whom the State has determined that the source water is not amenable to enhanced coagulation in accordance with §141.135(b)(3) and (4) of this chapter, respectively. These records must include the alternative limits and rationale for establishing the alternative limits.

(iii) States must keep records of subpart H systems using conventional treatment meeting any of the alternative compliance criteria in §141.135(a)(2) or (3) of this chapter.

(iv) States must keep a register of qualified operators that have met the State requirements developed under §142.16(f)(2).

(13) Records of systems with multiple wells considered to be one treatment plant in accordance with §141.132(a)(2) of this chapter and §142.16(f)(5).

(14) Monitoring plans for subpart H systems serving more than 3,300 persons in accordance with §141.132(f) of this chapter.

(15) List of laboratories approved for analyses in accordance with §141.131(b) of this chapter.

(16) List of systems required to monitor for disinfectants and disinfection byproducts in accordance with part 141, subpart L of this chapter. The list must indicate what disinfectants and DBPs, other than chlorine, TTHM, and HAA5, if any, are measured.

* * * * *

14. Section 142.16 is amended by adding paragraph (h) to read as follows.

§142.16 Special primacy requirements.

* * * * *

(h) Requirements for States to adopt 40 CFR part 141, subpart L. In addition to the general primacy requirements elsewhere in this part, including the requirement that State regulations be at least as stringent as federal requirements, an application for approval of a State program revision that adopts 40 CFR part 141, subpart L, must contain a description of how the State will accomplish the following program requirements:

(1) Section 141.64(b)(2) of this chapter (interim treatment requirements). Determine any interim treatment requirements for those systems electing to install GAC or membrane filtration and granted additional time to comply with §141.64 of this chapter.

(2) Section141.130(c) of this chapter (qualification of operators). Qualify operators of public water systems subject to 40 CFR part 141, subpart L. Qualification requirements established for operators of systems subject to 40 CFR part 141, subpart H - Filtration and Disinfection may be used in whole or in part to establish operator qualification requirements for meeting 40 CFR part 141, subpart L requirements if the State determines that the 40 CFR part 141, subpart H requirements are appropriate and applicable for meeting subpart L requirements.

(3) Section 141.131(c)(2) of this chapter (DPD colorimetric test kits). Approve DPD colorimetric test kits for free and total chlorine measurements. State approval granted under §141.74(a)(2) of this chapter for the use of DPD colorimetric test kits for free chlorine testing is acceptable for the use of DPD test kits in measuring free chlorine residuals as required in 40 CFR part 141, subpart L.

(4) Sections 141.131(c)(3) and (d) of this chapter (State approval of parties to conduct analyses). Approve parties to conduct pH, bromide, alkalinity, and residual disinfectant concentration measurements. The State's process for approving parties performing water quality measurements for systems subject to 40 CFR part 141, subpart H requirements in paragraph (b)(2)(i)(D) of this section may be used for approving parties measuring water quality parameters for systems subject to subpart L requirements, if the State determines the process is appropriate and applicable.

(5) Section 141.132(a)(2) of this chapter (multiple wells as a single source). Define the criteria to use to determine if multiple wells are being drawn from a single aquifer and therefore be considered a single source for compliance with monitoring requirements.

(6) Approve alternate minimum TOC removal (Step 2) requirements, as allowed under the provisions of §141.135(b) of this chapter.

Appendix F

Examples of Stage 1 DBPR Monitoring Forms for States

This appendix contains example monitoring forms that may be helpful if your state is developing monitoring forms for the Stage 1 DBPR. These examples are provided for demonstration purposes only. Therefore, instructions for completing the forms are not provided.

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Contents

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Examples of Selected Quarterly Reports

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A. Sample Generic Quarterly Report Format

(Based on Submission From the State of Wyoming - see next page for ideas on use.)

Quarterly Report to the Primacy Agency for the Running Annual Average (RAA) for [*insert constituent*].

Date:_____ System/Treatment Plant_____
PWSID #_____ Filtration Technology_____
Prepared By_____(Include laboratory results from the last quarter.)

Column #1 **Check one** 1st Quarter_____ (report by April 10th) 2nd Quarter_____ (report by July 10th) 3rd Quarter_____ (report by Oct 10th) 4th Quarter_____ (report by Jan 10th)	**Column #2** **[*insert constituent*]** Monthly Data [*insert units*]*	**Column #3** **[*insert constituent*]** Quarterly Average [*insert units*]**	**Column #4** **[*insert constituent*]** Running Annual Average [*insert units*]***
January of 20_ _			
February of 20 _ _			
March of 20 _ _			
April of 20 _ _			
May of 20 _ _			
June of 20 _ _			
July of 20 _ _			
August of 20 _ _			
September of 20 _ _			
October of 20 _ _			
November of 20 _ _			
December of 20 _ _			

*This sample is the average of all samples taken during the month

**Calculation of Quarterly Average: If the number for Jan. was 1.5 mg/L, Feb. was 1.9 mg/L and March was 1.1 mg/L then, add all three numbers up and divide by 3. For example, $\frac{(1.5 + 1.9 + 1.1)}{3}$ = 1.5 mg/L (this is your quarterly average.)

***Calculation of Running Annual Average: If the number for quarterly average for the 1st quarter was 1.5 mg/L, quarterly average for the 2nd quarter was 1.2 mg/L, quarterly average for the 3rd quarter was 1.1 mg/L and quarterly average for the 4th quarter was 1.8 mg/L then, add all four quarterly average numbers up and divide this time by 4. For example, $\frac{(1.5 + 1.2 + 1.1 + 1.8)}{4}$ = 1.4 mg/L (this is your running annual average.)

EXAMPLES OF CONSTITUENTS FOR GENERIC FORMAT

The previous Sample Generic Quarterly Report may be used for a variety of reports, including submissions for alternative compliance criteria. Constituents that can be inserted may include:

- Chlorine
- Chloramines
- Bromate for systems using ozone
- Haloacetic Acids Five
- Total Trihalomethanes
- Source Water Bromide for systems using ozone to reduce monitoring for bromate
- Finished Water Alkalinity
- Source Water Alkalinity
- Finished Water SUVA
- Source Water SUVA
- Source Water Total Organic Carbon
- Finished Water Total Organic Carbon
- Finished Water Total Organic Carbon for Reduced Monitoring of Source Water Alkalinity and TOC and Finished Water TOC
- Magnesium Removed
- Ratio of TOC Removed

See examples from the State of Wyoming on the following pages using the generic format. Please note there may be exceptions to the generic form.

Some of these quarterly reports may also be used in conjunction with worksheets to assist in caluculations. See the next section for examples of selected worksheets.

B. Sample Quarterly Report for TOC Removed From the State of Wyoming

(May be used in conjunction with worksheet. See page F-18 for accompanying worksheet.)

Quarterly Report to the Primacy Agency for the Running Annual Average (RAA) for Total Organic Carbon Removed

(PWSs utilizing conventional treatment must maintain a RAA of greater than 1.00 for the ratio of TOC removed to be in compliance.)

Date:_____ System/Treatment Plant_____
PWSID #_____ Filtration Technology_____
Prepared By_____(Include laboratory results from the last quarter.)

Column #1 **Check one** 1st Quarter_____ (report by April 10th) 2nd Quarter_____ (report by July 10th) 3rd Quarter_____ (report by Oct 10th) 4th Quarter_____ (report by Jan 10th)	Ratio of TOC Removed Monthly Data (from column F of the 1st page of this report)	Ratio of TOC Removed Quarterly Average (mg/L)*	Ratio of TOC Removed Running Annual Average (mg/L)**
January of 20_ _			
February of 20 _ _			
March of 20 _ _			
April of 20 _ _			
May of 20 _ _			
June of 20 _ _			
July of 20 _ _			
August of 20 _ _			
September of 20 _ _			
October of 20 _ _			
November of 20 _ _			
December of 20 _ _			

*Calculation of Quarterly Average: If the number for Jan. was 1.5 mg/L, Feb. was 1.9 mg/L and March was 1.1 mg/L then, add all three numbers up and divide by 3. For example, $\frac{(1.5 + 1.9 + 1.1)}{3}$ = 1.5 mg/L (this is your quarterly average.)

**Calculation of Running Annual Average: If the number for quarterly average for the 1st quarter was 1.5 mg/L, quarterly average for the 2nd quarter was 1.2 mg/L, quarterly average for the 3rd quarter was 1.1 mg/L and quarterly average for the 4th quarter was 1.8 mg/L then, add all four quarterly average numbers up and divide this time by 4. For example, $\frac{(1.5 + 1.2 + 1.1 + 1.8)}{4}$ = 1.4 mg/L (this is your running annual average.)

C Sample Quarterly Report for Finished Water Magnesium Removed From the State of Wyoming

(May be used in conjunction with worksheet. See page F-19 for accompanying worksheet.)

Additional Alternative Compliance Criteria for Softening Systems #2
Quarterly Report to the Primacy Agency for the Running Annual Average (RAA)
for Finished Water Magnesium Removed

(For a PWS that practices softening that cannot meet the TOC removal requirements for enhanced coagulation and chooses this additional alternative compliance criteria must maintain a RAA of greater than 10 mg/L for magnesium removed between the source water and treated water.)

Date:_____ System/Treatment Plant_____
PWSID #_____ Filtration Technology_____
Prepared By_____(Include laboratory results from the last quarter.)

Check one 1st Quarter_____ (Report by April 10th) 2nd Quarter_____ (Report by July 10th) 3rd Quarter_____ (Report by Oct 10th) 4th Quarter_____ (Report by Jan 10th)	Magnesium Removed Monthly Data (mg/L)* (from column C of page 1 of this report)	Magnesium Removed Quarterly Average (mg/L)**	Magnesium Removed Running Annual Average (mg/L)***
January of 20_ _			
February of 20 _ _			
March of 20 _ _			
April of 20 _ _			
May of 20 _ _			
June of 20 _ _			
July of 20 _ _			
August of 20 _ _			
September of 20 _ _			
October of 20 _ _			
November of 20 _ _			
December of 20 _ _			

*Samples must be taken at the source prior to treatment and after treatment to determine the amount of magnesium removed, see page 1of this report.

**Calculation of Quarterly Average: If the number for Jan. was 1.5 mg/L, Feb. was 1.9 mg/L and March was 1.1 mg/L then, add all three numbers up and divide by 3. For example, $\frac{(1.5 + 1.9 + 1.1)}{3}$ = 1.5 mg/L (this is your quarterly average.)

***Calculation of Running Annual Average: If the number for quarterly average for the 1st quarter was 1.5 mg/L, quarterly average for the 2nd quarter was 1.2 mg/L, quarterly average for the 3rd quarter was 1.1 mg/L and quarterly average for the 4th quarter was 1.8 mg/L then, add all four quarterly average numbers up and divide this time by 4. For example, $\frac{(1.5 + 1.2 + 1.1 + 1.8)}{4}$ = 1.4 mg/L (this is your running annual average.)

D. Sample Monthly TOC Removal Report From the State of Texas

MONTHLY TOTAL ORGANIC CARBON REMOVAL REPORT (TOC-MOR)

FOR SURFACE WATER OR GROUND WATER UNDER THE INFLUENCE OF SURFACE WATER SYSTEMS

PUBLIC WATER SYSTEM NAME: _____ **PLANT NAME OR NUMBER:** _____

PWS ID No.: _____ Month: _____ Year: _____

Type of treatment: ☐ Conventional ☐ Unconventional, explain: _____

Note: Systems are required to run one TOC Sample Set every month. Additional space is provided for those systems that do additional sampling

Date	Monthly TOC Sample Set			Actual % TOC Removed	Step 1 Required % Removal	Step 1 Removal RATIO	Optional data				COMPLIANCE REMOVAL RATIO
	Raw Alkalinity	Raw TOC	Treated TOC				Step 2 Required % Removal	Step 2 Removal Ratio	ACC # used	ACC Removal Ratio	
	Required plant data			*calculated*	*from matrix*	*calculated*	*attach Step2 form*	*calculated*	*attach ACCform*	*calculated*	*calculated*
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											
23											
24											
25											
26											
27											
28											
29											
30											
31											
Avg											
Max											
Min											

TOTAL ORGANIC CARBON (TOC) REMOVAL SUMMARY

	TOC Summary			TOC % Removal Summary		TOC Removal Ratio
	Raw Water Alkalinity	Raw Water TOC	Treated Water TOC	TOC % Removal	Requirement	

I certify that I am familiar with the information contained in this report and that, to the best of my knowledge, the information is true, complete, and accurate.

Operator's Signature: _____ Certificate No. and Grade: _____ Date: _____

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Examples of Worksheets
(These May Be Used in Conjunction with Quarterly Reports)

State of Wyoming

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A. Sample Chlorine/Chloramine Residual Worksheet From the State of Wyoming

Chlorine/Chloramine Residual Worksheet

(This worksheet is provided to assist a system in calculating the average of all chlorine or chloramine residual levels recorded during total coliform sampling during the month. Each row will contain only one residual level and will be located under one of the following headings: routine, repeat, increased routine or other compliance total coliform sample. The number from this row will be carried over to column F and summed on the second to last row of the table. The number calculated at the bottom right of this table is the average of all the months residual levels and is the number that is entered for that month in the second column of the chlorine/chloramine RAA monitoring form.)

Month _____ Year_____

A # of Samples (1, 2, 3, etc.)	B Chlorine/ Chloramine Level Recorded for Routine Total Coliform Sample (mg/L)	C Chlorine/ Chloramine Level Recorded for Repeat Total Coliform Sample (mg/L)	D Chlorine/ Chloramine Level Recorded for Increased Routine Total Coliform Sample (mg/L)	E Chlorine/ Chloramine Level Recorded for Other Compliance Total Coliform Sample (mg/L)	F Carry the Chlorine/ Chloramine Level in B, or C, or D, or E to this column (mg/L) (there should be only one sample per row)
Add all the numbers in column F and enter the sum here>>					
Calculate the average of all residual levels for the month by dividing the sum of column F by the total number of samples in column A (F/A). Enter this average into the 2nd column of the monitoring form for calculating the RAA for chlorine/chloramines.					

The monitoring forms for compliance with chlorine dioxide and chlorite are:

1 Quarterly Report to the Primacy Agency for Daily, Monthly, and Additional Chlorite Sampling for Systems using Chlorine Dioxide.

2 Quarterly Report to the Primacy Agency for Daily Chlorine Dioxide Sampling (no chlorine booster station) for Systems using Chlorine Dioxide.

3 Quarterly Report to the Primacy Agency for Daily Chlorine Dioxide Sampling (with a chlorine booster station) for Systems using Chlorine Dioxide.

B. Sample TTHM Worksheet From the State of Wyoming

TTHM Worksheet

(This worksheet is provided to assist a system in calculating the average of all TTHM samples that were taken during the month when more than one sample is required. The number calculated at the bottom right of this form is the average of all the months samples and is the number that is entered for that month in the second column of the TTHM RAA monitoring form.)

Month _____ Year_____

A # of Samples (1, 2, 3, etc.)	B Chloroform (mg/L)	C Bromoform (mg/L)	D Bromodichloro methane (mg/L)	E Dibromochloro methane (mg/L)	F TTHMs (mg/L) (B+C+D+E)
Add all the numbers in column F for TTHMs and enter the sum here>>					
Calculate the average of all samples for the month by dividing the sum of column F by the total number of samples in column A (F/A). Enter this average into the 2nd column of the monitoring form for calculating the RAA for TTHMs.					

C. Sample HAA5 Worksheet From the State of Wyoming

HAA5 Worksheet

(This worksheet is provided to assist a system in calculating the average of all HAA5 samples that were taken during the month when more than one sample is required. The number calculated at the bottom right of this form is the average of all the months samples and is the number that is entered for that month in the second column of the HAA5 RAA monitoring form.)

Month _____ Year_____

A # of Samples (1, 2, 3, etc.)	B Monochloro acetic acid (mg/L)	C Dichloro acetic acid (mg/L)	D Trichloro acetic acid (mg/L)	E Monobromo acetic acid (mg/L)	F Dibromo acetic acid (mg/L)	G HAA5 (mg/L) (B+C+D+E +F)
Add all the numbers in column G for HAA5s and enter the sum here>>						
Calculate the average of all samples for the month by dividing the sum of column G by the total number of samples in column A (G/A). Enter this average into the 2nd column of the monitoring form for calculating the RAA for HAA5s.						

D. Sample TOC Removed Worksheet From the State of Wyoming

(To be used in conjunction with quarterly report.)

Quarterly Report to the Primacy Agency for the Running Annual Average (RAA)
for <u>Total Organic Carbon Removed</u>

(PWSs utilizing conventional treatment must maintain a RAA of greater than 1.00 for the ratio of TOC removed to be in compliance.)

Has reduced monitoring been granted for source water alkalinity and TOC and finished water TOC (yes/no)?_____

Alternative Minimum TOC Removal Step 2 (if applicable)_____(substitute this # in column C)

Date:_____ System/Treatment Plant_____

PWSID #_____ Filtration Technology_____

Prepared By_____(Include laboratory results from the last quarter.)

Months of 20_ _	A Alkalinity Source mg/L*	B TOC Source mg/L*	C Percent TOC Removed (from table)	D TOC Finished (mg/L)*	E Actual TOC Removed (1-(D/B)) x 100	F Ratio of TOC Removed E/C**
January						
February						
March						
April						
May						
June						
July						
August						
September						
October						
November						
December						

*Samples for alkalinity and TOC at the source must be taken prior to any treatment including disinfectant application and finished water TOC sample must be taken at the combined filter effluent and prior to the addition of disinfectants (if possible). All three of these samples must be taken on the same hour of the same day.

**Transfer this data to the 2nd page of this report to column 2 entitled "Ratio of TOC Removed Monthly Data" and calculate the RAA of the percent TOC removed. If it benefits the PWS, in any month that the system's source or treated water TOC is less than 2.0 mg/L, the source or treated water SUVA is less than or equal to 2.0 L/mg-m or a system that practicing softening removes at least 10 mg/L of magnesium hardness or lowers the alkalinity below 60 mg/L the system may assign a monthly value of 1.0 in lieu of the calculated value. A system able to meet any one of the six alternative compliance criteria is required to report the source water alkalinity and TOC and finished water TOC but not required to perform the TOC removal calculation.

E. Sample Finished Water Magnesium Removed Worksheet From the State of Wyoming

(To be used in conjunction with quarterly report.)

Additional Alternative Compliance Criteria for Softening Systems #2
Quarterly Report to the Primacy Agency for the Running Annual Average (RAA) for Finished Water Magnesium Removed.

(For a PWS that practices softening that cannot meet the TOC removal requirements for enhanced coagulation and chooses this additional alternative compliance criteria must calculate the amount of magnesium removed between the source water prior to any treatment and the finished water. The PWS must also report quarterly, the monthly levels of source water alkalinity and TOC and finished water TOC.)

Date:_____ System/Treatment Plant_____
PWSID #_____ Filtration Technology_____
Prepared By_____(Include laboratory results from the last quarter.)

Months of 20_ _	A Source Water Magnesium (mg/L)*	B Finished Water Magnesium (mg/L)**	C Magnesium Removed (mg/L)*** (A-B)
January			
February			
March			
April			
May			
June			
July			
August			
September			
October			
November			
December			

*Sample must be taken at the source prior to treatment

**Sample must be taken after treatment

***Transfer this number to page two of this report to column 2 entitled "Magnesium Removed Monthly Data" for calculating the RAA of magnesium removed.

F. Sample Source Water Alkalinity and TOC and Finished Water TOC for Those Systems on an Alternative Compliance Criteria Worksheet From the State of Wyoming

Quarterly Report to the Primacy Agency for <u>Source Water Alkalinity and Total Organic Carbon (TOC) and Finished Water TOC</u> for those Systems on an Alternative Compliance Criteria.

(Conventional PWSs utilizing an alternative compliance criteria must also report source water alkalinity and TOC and finished water TOC. Systems on reduced monitoring from monthly to quarterly must also submit the report on the RAA of the finished water TOC.)

Requirements for Reduced Monitoring have been met (yes/no)_____
Date:_____ System/Treatment Plant_____
PWSID #_____ Filtration Technology_____
Prepared By_____(Include laboratory results from the last quarter.)

Months of 20_ _	Alkalinity Source mg/L*	TOC Source mg/L*	TOC Treated mg/L*
January			
February			
March			
April			
May			
June			
July			
August			
September			
October			
November			
December			

*If the system is on reduced monitoring then only one sample of each is required per quarter. Samples for alkalinity and TOC at the source must be taken prior to any treatment including disinfectant application and finished water TOC sample must be taken at the combined filter effluent and prior to the addition of disinfectants (if possible). All three of these samples must be taken on the same hour of the same day.

Examples for Systems Using Chlorine Dioxide
(These May Be Used in Conjunction with Quarterly Reports)

State of Wyoming

State of Texas

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A. Sample Quarterly Report for Daily Chlorine Dioxide Sampling with a Chlorine Booster Station From the State of Wyoming

Quarterly Report to the Primacy Agency for Daily Chlorine Dioxide Sampling (with a chlorine booster station) for Systems using Chlorine Dioxide)

(The PWS must monitor for chlorine dioxide daily at the entrance of the dist. system. Two consecutive daily samples exceeding 0.8 mg/L or failure to monitor a daily sample after exceeding 0.8 mg/L in a daily sample is a nonacute violation. A PWS exceeding the daily chlorine dioxide level of 0.8 mg/L must take a 3-sample set in the dist. system the following day at the first customer, average and maximum residence time. If any one of the three samples taken in the dist. system exceed 0.8 mg/L, it is an acute violation.)
Date:_____ System/Treatment Plant_____
PWSID #_____ Filtration Technology_____
Prepared By_____(Include laboratory results from the last quarter.)

Year_____ Month_____	ClO_2 Daily Data (mg/L)	ClO_2 Dist. First Customer (mg/L)	ClO_2 Dist. Average Residence time (mg/L)	ClO_2 Dist. Maximum Residence Time (mg/L)	ClO_2 Dist. Highest Level (mg/L)
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
. . .					
25					
26					
27					
28					
29					
30					
31					

B. Sample Quarterly Report for Daily Chlorine Dioxide Sampling with No Chlorine Booster Station From the State of Wyoming

Quarterly Report to the Primacy Agency for Daily Chlorine Dioxide Sampling (no chlorine booster station) for Systems using Chlorine Dioxide.

(The PWS must monitor for chlorine dioxide daily at the entrance of the dist. system. Two consecutive daily samples exceeding 0.8 mg/L or failure to monitor a daily sample after exceeding 0.8 mg/L in a daily sample is a nonacute violation. A PWS exceeding the daily chlorine dioxide level of 0.8 mg/L must take a 3-sample set in the dist. system the following day at the first customer at six hour intervals. If any one of the three samples taken in the dist. system exceed 0.8 mg/L, it is an acute violation.)

Date:_____ System/Treatment Plant_____

PWSID #_____ Filtration Technology_____

Prepared By_____(Include laboratory results from the last quarter.)

Year_____ Month_____	ClO_2 Daily Data (mg/L)	ClO_2 Dist. First Customer at 0 Hours (mg/L)	ClO_2 Dist. First Customer at 6 Hours (mg/L)	ClO_2 Dist. First Customer at 12 Hours (mg/L)	ClO_2 Dist. Highest Level (mg/L)
1					
2					
3					
. . .					
31					

C. Sample Quarterly Report to the Primacy Agency for Daily, Monthly, and Additional Chlorite Sampling

Quarterly Report to the Primacy Agency for Daily, Monthly, and Additional Chlorite Sampling (for Systems using Chlorine Dioxide).

(The PWS must monitor for chlorite daily at the entrance of the dist. system and one monthly 3-sample set in the dist system at the first customer, average and maximum residence time. A PWS exceeding the daily chlorite level of 1.0 mg/L must take an additional 3-sample set in the dist. system at the first customer, average and maximum residence time the following day. If the average of any 3-sample set exceeds 1.0 mg/L the system has a nonacute violation.) Reduced monitoring has been granted for monthly monitoring (yes/no)____

Date:_____ System/Treatment Plant_____

PWSID #_____ Filtration Technology_____

Prepared By_____(Include laboratory results from the last quarter.)

Year_____ Month_____	Chlorite Daily Data (mg/L)	Routine Monthly or Additional Dist. Sample	Distribution Chlorite at First Customer (mg/L)	Distribution Chlorite at Average Time (mg/L)	Distribution Chlorite at Max. Time (mg/L)	Average of Three Dist. Samples (mg/L)
1						
2						
3						
. . .						
31						

D. Sample Chlorine Dioxide Monthly Operating Report From the State of Texas

CHLORINE DIOXIDE MONTHLY OPERATING REPORT
FOR PUBLIC WATER SYSTEMS

PWS NAME: _____ PLANT NAME OR NUMBER: _____

PWS I.D. Number: _____ Connections: _____

Report Month: _____ Year: _____ Population: _____

RAW DATA							
DATE	ClO_2 Used?	ClO_2 POE	ClO_2 Distribution			Chlorite	
			First	Sec.	Third	POE	DIST
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
31							

DATA SUMMARY					
	ClO_2 POE	ClO_2 Distribution			Chlorite POE
		No. of Sets:			
		First	Sec.	Third	
# > Limit					
Max.					
Min.					
Avg.					

Chlorite Stock Solution
g/L chlorite
g/L chlorate

Booster Chlorination	No

Chlorine Dioxide (ClO_2) Violations	
	No. of Violations
Acute MRDL	
Non Acute MRDL	
Monitoring	
Public Notified?	
Date(s):	
TNRCC Notified?	
Date(s):	

BA for ClO_2 ?	
Date	

Chlorite Distribution Monitoring	
No. of Sets:	

Chlorite (ClO_2^-) Violations	
	No. of Violations
MCL Violation TBD by the TNRCC	
Monitoring	
Public Notified?	
Date(s):	
TNRCC Notified?	
Date(s):	

GENERAL REMARKS ABOUT ClO_2 GENERATOR

Total water treated this Month	Sodium Chlorite used this Month
MG	lbs.

I certify that I am familiar with the information contained in this report and that, to the best of my knowledge, the information is true, complete, and accurate.

Operator's Signature: _____

Certificate No. & Class: _____ Date: _____

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Other Reporting Forms

State of Texas

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A. Sample Alternative Compliance Criteria Report Forms From the State of Texas (Page 1)

ALTERNATIVE COMPLIANCE CRITERIA REPORT

FOR SURFACE WATER OR GROUND WATER UNDER THE INFLUENCE OF SURFACE WATER SYSTEMS

PUBLIC WATER SYSTEM NAME: _____ **PLANT NAME OR NUMBER:** _____

PWS ID No.: _____ **Month** _____ **Year** _____

This Alternative Compliance Criteria (ACC) Report is being submitted to request the following ACC: (check one)

(Put an "X" in the box that shows the number of the Alternative Compliance Criteria you are applying for)

#1 [ ] **#2** [ ] **#3** [ ] **#4** [ ] **#5** [ ] **#6** [ ] **#7** [ ] **#8** [ ]

ACC #1 — **Source Water TOC less than or equal to 2.0?** (calculated quarterly as a running annual average)

	1	2	3	4	5	6	7	8	9	10	11	12
Actual Month/Yr												
Monthly TOC												
Quarterly Average			#DIV/0!									
Yearly Average												

 # 2 — **Treated Water TOC less than or equal to 2.0?** (calculated quarterly as a running annual average)

	1	2	3	4	5	6	7	8	9	10	11	12
Actual Month/Yr												
Monthly TOC												
Quarterly Average			#DIV/0!									
Yearly Average												

 # 3 — **Treated Water TOC less than or equal to 4.0?** (calculated quarterly as a running annual average)
AND Source water alkalinity over 60 mg/L (as CaCO3)? (calculated quarterly as a running annual average)

	1	2	3	4	5	6	7	8	9	10	11	12
Actual Month/Yr												
Monthly TOC												
Quarterly Average TOC												
Yearly Average TOC												
Monthly Alkalinity												
Quarterly Ave. Alkalinity			#DIV/0!									
Yearly Ave. Alkalinity												

AND TTHM and HAA5 no greater than 0.040 mg/L and 0.030 mg/L, respectively?

Yearly Average TTHM: [ ] **mg/L** **Yearly Average HAA5:** [ ] **mg/L**

ATTACH COPY OF COMPLIANCE REPORT FOR DISINFECTION BY-PRODUCTS (TTHM AND HAA5)

 # 4

TTHM and HAA5 no greater than 0.040 mg/L and 0.030 mg/L, respectively?

Yearly Average TTHM: [ ] **mg/L** **Yearly Average HAA5:** [ ] **mg/L**

ATTACH COPY OF COMPLIANCE REPORT FOR DISINFECTION BY-PRODUCTS (TTHM AND HAA5)

AND only chlorine is used in the whole plant and distribution system.

I certify that for the last 12 months, only free chlorine was used as a disinfectant for primary disinfection and for maintenance of a residual in the distribution system.

_____
Certified Operators Signature/ Certification Number/Date

I certify that I am familiar with the information contained in this report and that, to the best of my knowledge, the information is true, complete, and accurate.

Operator's Signature: _____ Certificate No. and Grade: _____ **Date:** _____

A. Sample Alternative Compliance Criteria Report Forms From the State of Texas (Page 2)

ALTERNATIVE COMPLIANCE CRITERIA REPORT

FOR SURFACE WATER OR GROUND WATER UNDER THE INFLUENCE OF SURFACE WATER SYSTEMS

PUBLIC WATER SYSTEM NAME: _____ **PLANT NAME OR NUMBER:** _____

PWS ID No.: _____ Month _____ Year _____

 # 5 **Source water SUVA less than or equal to 2.0 L/mg-m?** (calculated quarterly as a running annual average)

(Source water SUVA is the dissolved organic carbon concentration divided by the ultraviolet light absorption at 254 nanometers in the source water before any treatment of any kind. Measure monthly.

	1	2	3	4	5	6	7	8	9	10	11	12
Actual Month/Year												
Monthly SUVA												
Quarterly Average SUVA												
Yearly Average SUVA												

 # 6 **Treated water SUVA less than or equal to 2.0 L/mg-m?** (calculated quarterly as a running annual average)

(Treated water SUVA is the dissolved organic carbon concentration divided by the ultraviolet light absorption at 254 nanometers in the finished water before any disinfection of any kind, or measured using a finished water SUVA jar test. (See the Instruc

Finished water measured: ☐ In Plant ☐ By Finished Water SUVA Jar Test (attach jar test report)

	1	2	3	4	5	6	7	8	9	10	11	12
Actual Month-Year												
Monthly SUVA												
Quarterly Average SUVA												
Yearly Average SUVA												

ACC #7 **Treated water alkalinity less than 60 mg/L (as CaCO3)?** (calculated quarterly as a running annual average)

(softening practiced)

	1	2	3	4	5	6	7	8	9	10	11	12
Actual Month-Year												
Monthly Treated Alkalinity												
Quarterly Ave. Treated Alk.												
Yearly Ave. Treated Alk.												

AND cannot achieve the Step 1 TOC removal

Step 1 Compliance Summary:

TOC % Removal Summary		TOC Removal Ratio
TOC % Removal	**Requirement**	

 # 8 **Magnesium hardness removal greater than or equal to 10 mg/L (as CaCO3)?** (calculated quarterly as a running annual

(softening practiced)

	1	2	3	4	5	6	7	8	9	10	11	12
Actual Month-Year												
Monthly Raw Mg. Hardness												
Monthly Treated Mg. Hardness												
Monthly Mg Removal												
Quarterly Ave. Mg Removal												
Yearly Ave. Mg Removal												

AND cannot achieve the Step 1 TOC removal

Step 1 Compliance Summary:

TOC % Removal Summary		TOC Removal Ratio
TOC % Removal	**Requirement**	

I certify that I am familiar with the information contained in this report and that, to the best of my knowledge, the information is true, complete, and accurate.

Operator's Signature: _____ Certificate No. and Grade: _____ **Date:** _____

B. Sample Step 2 Jar Test Report From the State of Texas

STEP 2 JAR TEST REPORT

FOR SURFACE WATER OR GROUND WATER UNDER THE INFLUENCE OF SURFACE WATER SYSTEMS

PUBLIC WATER SYSTEM NAME: _____ PLANT NAME OR NUMBER: _____

PWS ID No.: _____ Month _____ Year _____

CURRENT OPERATING CONDITIONS

COAGULANT BEING USED		
COAGULANT CONC.		%
COAGULANT FEED RATE		LBS/DAY
RAW WATER FLOW RATE		GPM

Maximum Allowable Alum Dose in Jar 1: _____ mg/L

DOSING SOLUTION CALCULATIONS

COAGULANT USED TO MAKE THE DOSING SOLUTION: _____ (Alumimum Sulfate, Ferric chloride,…)

SIZE OF THE JAR TEST JARS: _____ L

Other Dry Coagulants		Other Liquid Coagulants	
Coagulant		Coagulant	
Chemical Formula		Chemical Formula	
Molecular Formula		Molecular Formula	
Molecular Weight		Molecular Weight	
Cationic Charge		Cationic Charge	

AMOUNT OF COAGULANT NEEDED TO MAKE 1 L OF DOSING SOLUTION: _____ mls or grams

STEP 2 JAR TEST PARAMETERS

COAGULANT		BASE		MIXING CONDITIONS				
				Rapid Mix		Flocculation		Settling
Type	Dosing Solution Concentration (g/L)	Concentration Type	Concentration (g/L)	Speed (rpm)	Duration (minutes)	Speed (rpm)	Duration (minutes)	Duration (minutes)

PERFORMANCE DATA

Jar No.	COAGULANT Dose (mg/L)	COAGULANT Volume (mL)	BASE Dose (mg/L)	BASE Volume (mL)	Alkalinity (mg/Las CaCO3)	pH	TOC (mg/L)	Incremental TOC Removal (mg/L)	TOC Removal (%)
RAW									
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									

I certify that I am familiar with the information contained in this report and that, to the best of my knowledge, the information is true, complete, and accurate.

Operator's Signature: _____ Certificate No. and Grade: _____ Date: _____

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