

Appendix A

Primacy Revision Crosswalks

The Primacy revision crosswalk for the Interim Enhanced Surface Water Treatment Rule (IESWTR) 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 IESWTR 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 IESWTR with the original IESWTR, 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 IESWTR. 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 IESWTR

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			
Comprehensive performance evaluation (CPE)	§ 141.2		
Disinfection profile	§ 141.2		
Filter profile	§ 141.2		
Ground water under the direct influence of surface water	§ 141.2		
Uncovered finished water storage facility	§ 141.2		
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			
Microbiological contaminants	§ 141.32(e)(10)		
SUBPART F—MAXIMUM CONTAMINANT LEVEL GOALS¹			
§ 141.52 MAXIMUM CONTAMINANT LEVEL GOALS FOR MICROBIOLOGICAL CONTAMINANTS			
MCLG of zero for <i>Cryptosporidium</i>	§ 141.52(5)		
SUBPART H—FILTRATION AND DISINFECTION			
§ 141.70 GENERAL REQUIREMENTS			
PWSs serving at least 10,000 people must comply with additional requirements in Subpart P	§ 141.70(d)		

¹States do not need to have a corresponding MCLG.

Federal Requirement	Federal Citation	State Citation (document title, page number, section/paragraph)	Different from Fed. requirement? Explain on separate sheet
§ 141.71 CRITERIA FOR AVOIDING FILTRATION			
PWS must comply with requirements for TTHMs in §141.12 and §141.30 until <u>December 31, 2001</u> ; after <u>December 31, 2001</u> PWSs must comply with the Subpart L requirements for TTHMs, HAA5, bromate, chlorite, chlorine, chloramines, chlorine dioxide	§ 141.71(b)(6)		
§ 141.73 FILTRATION			
PWSs serving at least 10,000 people must meet turbidity requirements in §141.173(a) beginning <u>January 1, 2002</u>	§ 141.73(a)(3)		
PWS may use alternative filtration technology if it demonstrates that it removes 99.9% of <i>Giardia lamblia</i> and 99.99% of viruses; for a system that makes this demonstration the requirements of §141.172(b) apply; beginning <u>January 1, 2002</u> systems serving at least 10,000 people must meet the requirements for other filtration technologies in §141.173(b)	§ 141.73(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.			
§ 141.153 CONTENT OF THE REPORTS			
When it is reported pursuant to §141.73 or §141.173: highest single measurement and lowest monthly percentage of samples meeting the turbidity limits specified in §141.73 or §141.173 for the filtration technology being used	§ 141.153(d)(4)(v)(C)		
SUBPART P—ENHANCED FILTRATION AND DISINFECTION			
§ 141.170 GENERAL REQUIREMENTS			
Requirements are NPDWR	§ 141.170(a)		
Subpart P regulations establish requirements for filtration and disinfection that are in addition to criteria in Subpart H	§ 141.170(a)		
Applicable to Subpart H systems serving at least 10,000 people beginning <u>January 1, 2002</u>	§ 141.170(a)		

Federal Requirement	Federal Citation	State Citation (document title, page number, section/paragraph)	Different from Fed. requirement? Explain on separate sheet
Treatment techniques employed must reliably achieve 99% removal of <i>Cryptosporidium</i> for filtered systems; or <i>Cryptosporidium</i> control must be included in the watershed control plan for unfiltered systems	§ 141.170(a)(1)		
Compliance with the profiling and benchmark requirements under the provisions of §141.172	§ 141.170(a)(2)		
PWS is considered in compliance if it meets the requirements for avoiding filtration in §141.71 and §141.171 and the disinfection requirements in §141.72 and §141.172	§ 141.170(b)(1)		
PWS is in compliance if it meets the applicable filtration requirements in §141.173 or §141.73 and the disinfection requirements in §141.72 and §141.172	§ 141.170(b)(2)		
PWSs are not permitted to begin construction of an uncovered finished water storage facility beginning February 16, 1999	§ 141.170(c)		
§ 141.171 CRITERIA FOR AVOIDING FILTRATION			
System that does not filter must maintain watershed control program under § 141.71(b)(2) to minimize potential contamination by <i>Cryptosporidium</i>	§ 141.171(a)		
System that does not filter must identify watershed characteristics and activities for <i>Cryptosporidium</i> that may have an adverse effect on source water quality	§ 141.171(a)(1)		
System that does not filter must monitor the occurrence of activities that may have an adverse effect on source water quality with respect to <i>Cryptosporidium</i>	§ 141.171(a)(2)		
State determines during onsite inspection whether watershed control program is adequate to limit potential contamination by <i>Cryptosporidium</i>	§ 141.171(b)		

Federal Requirement	Federal Citation	State Citation (document title, page number, section/paragraph)	Different from Fed. requirement? Explain on separate sheet
§ 141.172 DISINFECTION PROFILING AND BENCHMARKING²			
Subpart H systems serving at least 10,000 people must determine its TTHM and HAA5 annual averages using procedures in (a)(1) and (a)(2)	§ 141.172(a)		
TTHM annual average must be the annual average during the same period as is used for the HAA5 annual average	§ 141.172(a)(1)		
Systems that collected ICR data must use the results of samples collected during the last 4 quarters of monitoring under §141.142	§ 141.172(a)(1)(i)		
Systems that use “grandfathered” HAA5 occurrence data that meet the provisions of (a)(2)(ii) must use TTHM data collected at the same time under the provisions of §141.12 and §141.30	§ 141.172(a)(1)(ii)		
Systems that use HAA5 occurrence data that meet the provisions of (a)(2)(iii)(A) must use TTHM data collected at the same time under the provisions of §141.12 and §141.30	§ 141.172(a)(1)(iii)		
HAA5 annual average must be the annual average during the same period as is used for the TTHM annual average	§ 141.172(a)(2)		
Systems that collected ICR data must use the results of samples collected during the last 4 quarters of monitoring under §141.142	§ 141.172(a)(2)(i)		
Four quarters of HAA5 occurrence data that meet routine monitoring sample number and location requirements in §141.12 and §141.130 and the analytical methods requirements in §141.142 (b)(1) may be used to determine if this section applies	§ 141.172(a)(2)(ii)		
Systems that have not collected 4 quarters of HAA5 occurrence data that meet either (a)(2)(i) or (a)(2)(ii) must begin to conduct monitoring for HAA5 to determine if the requirements of (b) apply by March 16, 1999; applicability must be determined no later than <u>March 31, 2000</u> after publication	§ 141.172(a)(2)(iii)(A)		

² For requirements that will be completed prior to state rule adoption, a state regulation does not need to include these requirements to still be considered as stringent as the Federal requirements.

Federal Requirement	Federal Citation	State Citation (document title, page number, section/paragraph)	Different from Fed. requirement? Explain on separate sheet
Systems that do not conduct monitoring in (A) must comply with all other provisions of this section as if HAA5 monitoring had been conducted and the results required compliance with (b) of this section	§ 141.172(a)(2)(iii)(B)		
System may request that state approve a more representative annual data set than the data set determined under (a)(1) or (a)(2) for the purposes of determining applicability of the requirements of this section	§ 141.172(a)(3)		
State may require that the system use a more representative annual data set than the data set determined under (a)(1) or (a)(2) for the purposes of determining applicability with this section	§ 141.172(a)(4)		
System must submit applicability data to the state on the schedule in (a)(5)(i) through (v)	§ 141.172(a)(5)		
Systems that collected TTHM and HAA5 data under the provisions of the ICR must submit the results of the samples collected during the last 12 months of monitoring under §141.142 no later than <u>December 31, 1999</u>	§ 141.172(a)(5)(i)		
Systems that collected 4 quarters of HAA5 occurrence data that meet the monitoring sample number and location for TTHM in §141.12 and §141.30 and handling and analytical methods requirements of §141.142(b)(1) must submit these data to the state no later than April 16, 1999; until the data has been approved the system must conduct monitoring for HAA5 using the monitoring requirements in (a)(2)(iii)	§ 141.172(a)(5)(ii)		
Systems that conducted monitoring for HAA5 using monitoring requirements specified in (a)(1)(iii) and (a)(2)(iii)(A) must submit these data no later than <u>March 31, 2000</u>	§ 141.172(a)(5)(iii)		
Systems that elect to comply with all other provisions of this section as if HAA5 monitoring had been conducted and the results required compliance with this section must notify the state in writing of their election no later than December 31, 1999	§ 141.172(a)(5)(iv)		
Systems that elect to request that the state approve a more representative annual data set must submit their requests in writing no later than December 31, 1999	§ 141.172(a)(5)(v)		

Federal Requirement	Federal Citation	State Citation (document title, page number, section/paragraph)	Different from Fed. requirement? Explain on separate sheet
Any system having a TTHM annual average \$0.064 mg/L or an HAA5 annual average \$0.048 mg/L during the period in (a)(1) and (2) must develop a disinfection profile as described in (b)	§ 141.172(a)(6)		
System that meets applicability criteria in (a)(6) must develop a disinfection profile for its disinfection practice for period of up to 3 years	§ 141.172(b)(1)		
System must monitor daily for a period of 12 consecutive calendar months to determine total logs of inactivation for each day of operation; based on CT99.9 in §141.74(b); must begin monitoring no later than <u>April 1, 2000</u> ; system with single point of disinfectant application must conduct monitoring in (b)(2)(i) through (iv); system with more than one point of disinfectant application must conduct monitoring in (b)(2)(i) through (iv) for each disinfection segment; system must monitor necessary parameters to determine total inactivation ratios using analytical methods in §141.74(a)	§ 141.172(b)(2)		
Temperature of disinfected water must be measured once per day at each residual disinfectant concentration sampling point during peak hourly flow	§ 141.172(b)(2)(i)		
pH of disinfected water must be measured once per day at each disinfectant residual concentration sampling point during peak hourly flow if system uses chlorine	§ 141.172(b)(2)(ii)		
Disinfectant contact time(s) (“T”) must be determined for each day during peak hourly flow	§ 141.172(b)(2)(iii)		
Residual disinfection concentration(s) (“C”) of the water before or at first customer prior to each additional point of disinfection must be measured each day during peak hourly flow	§ 141.172(b)(2)(iv)		
In lieu of the monitoring under (b)(2) to develop a profile a system may elect to meet requirements of (b)(3)(i)	§ 141.172(b)(3)		

Federal Requirement	Federal Citation	State Citation (document title, page number, section/paragraph)	Different from Fed. requirement? Explain on separate sheet
PWS that has 3 years of existing operational data may submit those data, a profile generated using those data, and a request that the state approve use of these data in lieu of monitoring under (b)(2) no later than <u>March 31, 2000</u> ; state must determine if the data are substantially equivalent to the data collected under (b)(2); data must be representative of <i>Giardia lamblia</i> inactivation through the entire treatment plant; until state approves the data set the system is required to conduct monitoring under (b)(2)	§ 141.172(b)(3)(i)		
PWS that has existing operational data may use those data to develop a disinfection profile for additional years; systems may use the additional yearly disinfection profiles to develop a benchmark under (c); state must determine whether the operational data are substantially equivalent to the data collected under (b)(2); data must be representative of inactivation through entire the treatment plant	§ 141.172(b)(3)(ii)		
System must calculate the total inactivation ratio(s) as specified in (b)(4)(i) through (iii)	§ 141.172(b)(4)		
If the system uses 1 point of disinfection it may determine the total inactivation ratio based on either method in (b)(4)(i)(A) or (b)(4)(i)(B)	§ 141.172(b)(4)(i)		
If the system uses 1 point of disinfection it may determine one inactivation ratio ($CT_{calc}/CT_{99.9}$) before or at the first customer during peak hourly flow	§ 141.172(b)(4)(i)(A)		
If the system uses 1 point of disinfection it may determine successive $CT_{calc}/CT_{99.9}$ values representing sequential inactivation ratios between the point of disinfectant application and a point before or at the first customer during peak hourly flow; system must calculate the total inactivation ratio by determining ($CT_{calc}/CT_{99.9}$) for each sequence and then adding ($CT_{calc}/CT_{99.9}$) values to determine ($3(CT_{calc}/CT_{99.9})$)	§ 141.172(b)(4)(i)(B)		
If system uses more than 1 point of disinfectant application before the first customer the system must determine CT value of each disinfection sequence immediately prior to the next point of disinfectant application, or for the final segment before or at the first customer during peak hourly flow; ($CT_{calc}/CT_{99.9}$) value of each sequence and ($3(CT_{calc}/CT_{99.9})$) must be calculated using methods in (b)(4)(i)	§ 141.172(b)(4)(ii)		

Federal Requirement	Federal Citation	State Citation (document title, page number, section/paragraph)	Different from Fed. requirement? Explain on separate sheet
System must determine the total logs of inactivation by multiplying the value calculated in (b)(4)(i) or (ii) of this section by 3.0	§ 141.172(b)(4)(iii)		
System that uses chloramines or ozone for primary disinfection must also calculate the logs of inactivation for viruses using a method approved by the state	§ 141.172(b)(5)		
System must retain the disinfection profile data in graphic form, as a spreadsheet, or some other format acceptable to the state for review as part of sanitary surveys conducted by the state	§ 141.172(b)(6)		
System required to develop a disinfection profile under (a) and (b) that decides to make a significant change to its disinfection practice must consult with the state prior to making such a change	§ 141.172(c)(1)		
Significant change to disinfection practice: changes to point of disinfection	§ 141.172(c)(1)(i)		
Significant change to disinfection practice: changes to disinfectant(s) used in treatment plant	§ 141.172(c)(1)(ii)		
Significant change to disinfection practice: changes to disinfection process	§ 141.172(c)(1)(iii)		
Significant change to disinfection practice: any other modification identified by the state	§ 141.172(c)(1)(iv)		
System modifying disinfection practice must calculate disinfection benchmark using procedure specified in (c)(2)(i) through (ii)	§ 141.172(c)(2)		
For each year of profiling data collected in (b) the system must determine the lowest average monthly <i>Giardia lamblia</i> inactivation in each year of profiling data; system must determine average <i>Giardia lamblia</i> inactivation for each calendar month for each year of profiling data by dividing the sum of daily <i>Giardia lamblia</i> logs of inactivation by the number of values calculated for that month	§ 141.172(c)(2)(i)		
Disinfection benchmark is the lowest monthly average (systems with 1 year of profiling data) or the average of lowest monthly average values (systems with more than 1 year of profiling data) of monthly logs of <i>Giardia lamblia</i> inactivation in each year of profiling data	§ 141.172(c)(2)(ii)		

Federal Requirement	Federal Citation	State Citation (document title, page number, section/paragraph)	Different from Fed. requirement? Explain on separate sheet
System using chloramines or ozone for primary disinfection must also calculate disinfection benchmark for viruses using a method approved by the state	§ 141.172(c)(3)		
System must submit information in (c)(4)(i) through (iii) to the state as part of its consultation process	§ 141.172(c)(4)		
Consultation process: description of proposed change	§ 141.172(c)(4)(i)		
Consultation process: disinfection profile and benchmark for <i>Giardia lamblia</i> and viruses, if necessary	§ 141.172(c)(4)(ii)		
Consultation process: analysis of how the proposed change will affect the current level of disinfection	§ 141.172(c)(4)(iii)		
§ 141.173 FILTRATION			
Subpart H system that does not meet all criteria for avoiding filtration must provide treatment consisting of disinfection (§141.72(b)) and a filtration treatment that complies with requirements of (a) or (b) or §141.73(b) or (c) by <u>December 31, 2001</u>	§ 141.173		
For systems using conventional/direct filtration the turbidity level of representative samples of a system's filtered water must be #0.3 NTU in at least 95% of monthly measurements measured as specified in §141.74(a) and (c)	§ 141.173(a)(1)		
For systems using conventional/direct filtration the turbidity level of representative samples of a system's filtered water must at no time exceed 1 NTU measured as specified in §141.74(a) and (c)	§ 141.173(a)(2)		
Systems that use lime softening may acidify representative samples prior to analysis using a protocol approved by the state	§ 141.173(a)(3)		

Federal Requirement	Federal Citation	State Citation (document title, page number, section/paragraph)	Different from Fed. requirement? Explain on separate sheet
<p>For systems using other than conventional/direct/slow sand/diatomaceous earth filtration the system may use a filtration technology not listed in (a) or §141.73(b) or (c) if it demonstrates that the alternative filtration technology in combination with disinfection treatment that meets the requirements in §141.72(b) consistently removes/inactivates 99.9% of <i>Giardia lamblia</i> cysts, 99.99% of viruses, and 99% of <i>Cryptosporidium</i> oocysts; state must approve the use of the technology; state will set turbidity performance requirements that the system must meet 95% of the time and the system may not at any time exceed a level that removes/inactivates 99.9% <i>Giardia lamblia</i>, 99.99% viruses, 99% <i>Cryptosporidium</i></p>	§ 141.173(b)		
<p>§141.174 FILTRATION SAMPLING REQUIREMENTS</p>			
<p>Subpart H systems using conventional/direct filtration must conduct continuous turbidity monitoring for each individual filter using an approved method in §141.74(a) and must calibrate turbidimeters using the procedure specified by the manufacturer; system must record the results of individual filter monitoring every 15 minutes</p>	§ 141.174(a)		
<p>If there is a failure in continuous turbidity monitoring equipment the system must conduct grab sampling every 4 hours in lieu of continuous monitoring, but for no more than five working days following the failure of the equipment</p>	§ 141.174(b)		
<p>§ 141.175 REPORTING AND RECORDKEEPING REQUIREMENTS</p>			
<p>In addition to requirements in §141.75, Subpart H systems using conventional/direct filtration must report monthly to the state the information in (a) and (b) beginning <u>January 1, 2002</u>; systems using alternative filtration technologies must report monthly to the state the information in (a) in lieu of reporting in (b)(1)</p>	§ 141.175		
<p>Turbidity measurements must be reported within 10 days after the end of each month the system serves water to the public</p>	§ 141.175(a)		
<p>Information that must be reported: total number of filtered water turbidity measurements taken during the month</p>	§ 141.175(a)(1)		

Federal Requirement	Federal Citation	State Citation (document title, page number, section/paragraph)	Different from Fed. requirement? Explain on separate sheet
Information that must be reported: number and percentage of filtered water turbidity measurements taken during the month that are less than or equal to the turbidity limits specified in §141.173(a) or (b)	§ 141.175(a)(2)		
Information that must be reported: date and value of any turbidity measurements taken during the month that exceed 1 NTU for systems using conventional/direct filtration or that exceed the maximum level set by the state under §141.173(b)	§ 141.175(a)(3)		
Systems must maintain the results of individual filter monitoring for at least 3 years; systems must report they have conducted individual filter monitoring within 10 days after the end of each month the system serves water to the public; system must report individual filter turbidity measurements within 10 days after the end of each month the system serves water to the public only if the measurements demonstrate 1 or more of the conditions in (b)(1) through (4); system using lime softening may apply to the state for alternative exceedance levels if they can demonstrate that the higher turbidity levels in individual filters are due to lime carryover and not to degraded filter performance	§ 141.175(b)		
For any individual filter that has measured a turbidity level of greater than 1.0 NTU in 2 consecutive measurements taken 15 minutes apart the system must report filter number, turbidity measurements, and date(s) of exceedance; system must produce a filter profile within 7 days of the exceedance and report that the profile has been produced OR report the obvious reason for the exceedance	§ 141.175(b)(1)		
For any individual filter that has measured a turbidity level of greater than 0.5 NTU in 2 consecutive measurements taken 15 minutes apart after the first four hours of continuous operation after filter has been backwashed or otherwise taken offline the system must report filter number, turbidity measurements, and date(s) of exceedance; system must produce a filter profile within 7 days of the exceedance and report that the profile has been produced OR report the obvious reason for the exceedance	§ 141.175(b)(2)		

Federal Requirement	Federal Citation	State Citation (document title, page number, section/paragraph)	Different from Fed. requirement? Explain on separate sheet
<p>For any individual filter that has measured a turbidity level of greater than 1.0 NTU in 2 consecutive measurements taken 15 minutes apart in each of 3 consecutive months the system must report filter number, turbidity measurements, and date(s) of exceedance; system must conduct a self-assessment of the filter within 14 days of the exceedance and report that the self-assessment has been conducted; self-assessment must consist of an assessment of filter performance, development of a filter profile, identification and prioritization of factors that limit filter performance, an assessment of the applicability of corrections, preparation of a filter self-assessment report</p>	§ 141.175(b)(3)		
<p>For any individual filter that has measured a turbidity level of greater than 2.0 NTU in 2 consecutive measurements taken 15 minutes apart in 2 consecutive months the system must report filter number, turbidity measurements, and date(s) of exceedance; system must contact the state or a 3rd party to conduct a comprehensive performance evaluation no later than 30 days following the exceedance and have the evaluation completed and submitted to the state no later than 90 days following the exceedance</p>	§ 141.175(b)(4)		
<p><u>If at any time the turbidity exceeds 1 NTU in representative samples of filtered water in a system using conventional filtration treatment or direct filtration, the system must inform the state as soon as possible, but no later than the end of the next business day.</u></p>	§ 141.175(c)(1)		
<p><u>If at any time the turbidity in representative samples of filtered water exceeds the maximum level set by the state under 141.173 (b) for filtration technologies other than conventional filtration treatment, direct filtration, slow sand filtration, or diatomaceous earth filtration, the system must inform the state as soon as possible, but no later than the end of the next business day.</u></p>	§ 141.175(c)(2)		

PRIMACY REVISION CROSSWALK FOR THE IESWTR

Federal Requirement	Federal Citation	Explanation of State Policies and Procedures
SUBPART B—PRIMARY ENFORCEMENT RESPONSIBILITY		
§ 142.14 RECORDS KEPT BY STATES		
Records of turbidity measurements must be kept for not less than 1 year in a form that makes them comparable with the limits specified in §141.71, §141.73, §141.173, §141.175	§ 142.14(a)(3)	
Records of disinfectant residual measurements and other parameters necessary to document disinfection effectiveness, in accordance with §141.72 and §141.74, must be kept for not less than 1 year	§ 142.14(a)(4)(i)	
Records of reporting requirements of §141.75 and §141.175 must be kept for no less than 1 year	§ 142.14(a)(4)(i)	
Records of decisions made on a system-by-system and case-by-case basis must be kept in writing and kept at the state	§ 142.14(a)(4)(ii)	
Records of systems consulting with the state concerning modification to their disinfection practices under §141.172(c) including status of the consultation must be kept	§ 142.14(a)(7)(i)	
Records of decisions that a system using alternative filtration technologies can consistently remove/inactivate 99% of <i>Cryptosporidium</i> , 99.9 percent removal and/or inactivation of <i>Giardia lamblia</i> , 99.99 percent removal and/or inactivation of viruses must be kept; decision must include state-set enforceable turbidity limits for each system; copy of decision must be kept until decision is reversed or revised; state must provide copy of decision to the system	§ 142.14(a)(7)(ii)	
Records of systems required to do filter self-assessment, CPE, or CCP under the requirements of §141.175 must be kept	§ 142.14(a)(7)(iii)	
§ 142.15 REPORTS BY STATES		
List of Subpart H systems that have had a sanitary survey completed during the previous year and an annual evaluation of the state's program for conducting sanitary surveys under §141.16(b)(3)	§ 142.15(c)(5)	

Federal Requirement	Federal Citation	Explanation of State Policies and Procedures
§ 142.16 SPECIAL PRIMACY REQUIREMENTS		
States must have the appropriate rules or other authority to assure that PWSs respond to significant deficiencies outlined in sanitary survey reports no later than 45 days after receipt of the report indicating how and on what schedule the system will address significant deficiencies noted in the survey	§ 142.16(b)(1)(ii)	
States must have the appropriate rules or other authority to assure that PWSs take the necessary steps to address significant deficiencies identified in the sanitary survey reports if such deficiencies are within the control of a PWS and its governing body	§ 142.16(b)(1)(iii)	
Application must describe how the state will implement a sanitary survey program that meets requirements in (b)(3)(i) through (v)	§ 142.16(b)(3)	
Conduct sanitary surveys that address the 8 sanitary survey components for all Subpart H systems no less frequently than every 3 years for CWS and no less than every 5 years for NCWS; state may allow sanitary surveys conducted after December 1995 to serve as the first set of required sanitary surveys if the surveys address the 8 sanitary survey components	§ 142.16(b)(3)(i)	
Sanitary survey component: source	§ 142.16(b)(3)(i)(A)	
Sanitary survey component: treatment	§ 142.16(b)(3)(i)(B)	
Sanitary survey component: distribution system	§ 142.16(b)(3)(i)(C)	
Sanitary survey component: finished water storage	§ 142.16(b)(3)(i)(D)	
Sanitary survey component: pumps, pump facilities, and controls	§ 142.16(b)(3)(i)(E)	
Sanitary survey component: monitoring, reporting, and data verification	§ 142.16(b)(3)(i)(F)	
Sanitary survey component: system management and operation	§ 142.16(b)(3)(i)(G)	
Sanitary survey component: operator compliance with state requirements	§ 142.16(b)(3)(i)(H)	
For CWSs determined by the state to have outstanding performance based on prior sanitary surveys, subsequent sanitary surveys may be conducted no less than every 5 years; state must describe how it will decide whether a system has outstanding performance and is eligible for sanitary surveys at a reduced frequency	§ 142.16(b)(3)(ii)	
Components of the sanitary survey may be completed as part of a staged or phased state review process within the established frequency	§ 142.16(b)(3)(iii)	

Federal Requirement	Federal Citation	Explanation of State Policies and Procedures
State must review the disinfection profile as part of the sanitary survey for systems that are required to comply with the profiling requirements in §141.172	§ 142.16(b)(3)(iv)	
State must describe how it will decide whether a deficiency identified during the sanitary survey is significant for purposes of (b)(1)(ii)	§ 142.16(b)(3)(v)	
States must have the appropriate rules or other authority to require PWSs to conduct a CCP and assure that PWSs implement the followup recommendations that result from a CCP	§ 142.16(g)(1)	
How the state will approve more representative annual data set than the data set for §141.172(a)(1) or (2) for the purposes of determining the applicability of the requirements of §141.172	§ 142.16(g)(2)(i)	
How the state will approve the method to calculate the logs of inactivation for viruses for a system that uses chloramines or ozone for primary disinfection	§ 142.16(g)(2)(ii)	
How the state will consult with PWSs to evaluate modifications to their disinfection practices	§ 142.16(g)(2)(iii)	
How the state will determine that a PWS may use an alternative filtration technology if in combination with disinfection it achieves 99.9% removal/inactivation of <i>Giardia lamblia</i> , 99.99% of viruses, 99% of <i>Cryptosporidium</i> ; how the state will set the turbidity performance requirements that a system must meet 95% of the time and may not exceed at any time a level that consistently removes/inactivates 99.9% of <i>Giardia lamblia</i> , 99.99% of viruses, 99% of <i>Cryptosporidium</i>	§ 142.16(g)(2)(iv)	

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Appendix B

Sample Extension Agreement

Under 40 CFR 142.12, states must adopt the requirements of the Interim Enhanced Surface Water Treatment Rule (IESWTR) 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

Interim Enhanced Surface Water Treatment Rule (IESWTR)

On December 16, 1998, the U.S. Environmental Protection Agency (EPA) published the final Interim Enhanced Surface Water Treatment Rule (IESWTR). 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. Most provisions of the rules take effect 36 to 60 months after publication. Some provisions however, affect public water systems (PWSs) earlier.

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 IESWTR 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 regulation.

This document records the terms of a Primacy Extension Agreement between the (Name of State Agency) (the State) and the EPA, Region ____ for the Interim Enhanced Surface Water Treatment 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 IESWTR.

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 IESWTR;
- ' Identify other State agencies that should receive copies of the IESWTR. 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 IESWTR;
- ' Devise a tracking system for PWSs' monitoring and reporting performed pursuant to the IESWTR;
- ' Issue notices to PWSs that fail to meet requirements of the IESWTR;
- ' Provide copies of the IESWTR in response to public inquiries;
- ' Report IESWTR 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

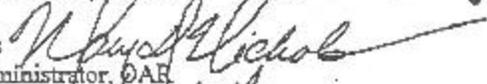
MEMORANDUM

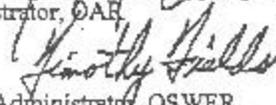
SUBJECT: Statement of Principles
Effect of State Audit Immunity/Privilege Laws
On Enforcement Authority for Federal Programs

TO: Regional Administrators

FROM: Steven A. Herman 
Assistant Administrator, OECA

Robert Perciasepe
Assistant Administrator, OAR

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.

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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

IESWTR Plain English Summary

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The Interim Enhanced Surface Water Treatment Rule

What Does it Mean to You?

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Definitions and Abbreviations

Definitions

Comprehensive performance evaluation (CPE) — is a thorough review and analysis of a treatment plant’s performance-based capabilities and associated administrative, operation and maintenance practices. It is conducted to identify factors that may be adversely impacting a plant’s capability to achieve compliance and emphasizes approaches that can be implemented without significant capital improvements.

Disinfection profile — is a summary of daily *Giardia lamblia* inactivation through the treatment plant.

Filter profile — is a graphical representation of individual filter performance, based on continuous turbidity measurements or total particle counts versus time for an entire filter run, from startup to backwash inclusively, that includes an assessment of filter performance while another filter is being backwashed.

Uncovered finished water storage facility ---- is a tank, reservoir, or other facility used to store water that will undergo no further treatment except residual disinfection and is open to the atmosphere.

Abbreviations Used in This Document

CCP:	Composite Correction Program
CDC:	Centers for Disease Control
CPE:	Comprehensive Performance Evaluation
CTA:	Comprehensive Technical Assistance
CWS:	Community Water System
DBP:	Disinfection Byproducts
DBPP:	Disinfection Byproducts Precursors
DBPR:	Disinfectants/Disinfection Byproducts Rule
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 (Monochloroacetic, Dichloroacetic, Trichloroacetic, Monobromoacetic and Dibromoacetic Acids)
hrs:	Hours
ICR:	Information Collection Rule

IESWTR:	Interim Enhanced Surface Water Treatment Rule
Log Inactivation:	Logarithm of (N_0/N_T)
Log:	Logarithm (common, base 10)
LT1ESWTR:	Long Term 1 Enhanced Surface Water Treatment Rule
LT2ESWTR:	Long Term 2 Enhanced Surface Water Treatment Rule
LTESWTR:	Long Term Enhanced Surface Water Treatment Rule
MCL:	Maximum Contaminant Level
MCLG:	Maximum Contaminant Level Goal
M-DBP:	Microbial and Disinfectants/Disinfection Byproducts
MR:	Monitoring/Reporting
MRDL:	Maximum Residual Disinfectant Level
MRDLG:	Maximum Residual Disinfectant Level Goal
NCWS:	Non-Community Water System
NSCEP:	National Service for Environmental Publications
NTIS:	National Technical Information Service
NTNCWS:	Non-Transient Non-Community Water System
NTU:	Nephelometric Turbidity Unit
PWS:	Public Water System
RegNeg.:	Regulatory Negotiation
SDWA or "The Act":	Safe Drinking Water Act
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 Absorption
SWTR:	Surface Water Treatment Rule
TNCWS:	Transient Non-Community Water System
TOC:	Total Organic Carbon
TTHM:	Total Trihalomethanes
x log removal:	Reduction to $1/10^x$ of original concentration

1. Introduction

Purpose of the Guide

The purpose of this guide is to detail the regulatory requirements of the Interim Enhanced Surface Water Treatment Rule (IESWTR). The IESWTR, published in the *Federal Register* on December 16, 1998 (63 FR 69478; www.epa.gov/OGWDW/mdbp/ieswtrfr.html; 66 FR 3770; www.epa.gov/safewater/mdbp/iesfr.html; Appendix H—rule language only), 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 IESWTR is designed to address the health risks from microbial contaminants without significantly increasing the potential risks from chemical contaminants. This rule was published concurrently with the Stage 1 Disinfectants/Disinfection Byproducts Rule (Stage 1 DBPR), which addresses control of disinfectants and their byproducts.

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. By targeting these gaps, multiple threats can be minimized.

The IESWTR builds on the SWTR by adding protection from *Cryptosporidium* through strengthened combined filter effluent turbidity performance standards and individual filter turbidity provisions for filtered systems that serve greater than 10,000 people. For unfiltered systems, *Cryptosporidium* must be included in the watershed control requirements. In addition, the IESWTR builds on the TCR by requiring sanitary surveys for all public water systems using surface water and ground water under the direct influence of surface water. The IESWTR also requires covers for all new finished water storage facilities and includes disinfection benchmark provisions to ensure continued levels of microbial protection while taking the necessary steps to comply with the DBP standards. Collectively, the SWTR and IESWTR place stringent treatment requirements on systems using surface water as a source.

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 Committees 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:

- C 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;
- C 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,
- C 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 IESWTR will improve public health by increasing the level of protection from exposure to *Cryptosporidium* and other pathogens in drinking water supplies through improvements in filtration at water systems. According to the risk assessment performed for the Regulatory Impact Analysis, the IESWTR decreases the likelihood of endemic illness (constant, low-level presence of a disease or infection) from *Cryptosporidium* by 110,000 to 463,000 cases annually. Based on these values, the estimated annual benefits of reducing the illness range from \$0.263 billion to \$1.240 billion per year. This calculation is based on a valuation of \$2,000 per incidence of cryptosporidiosis prevented. The IESWTR will also reduce the risk of more severe health impacts on sensitive populations, including the risk of mortality. Additionally, the IESWTR will reduce the likelihood of outbreaks of cryptosporidiosis and its associated costs by providing a larger margin of safety against such outbreaks in some systems.

2. Applicability and Compliance Dates

The IESWTR applies to *public water systems (PWSs) that use surface water or ground water under the direct influence of surface water (GWUDI) as a source (also known as subpart H systems) and serve 10,000 or more people*. Additionally, it establishes a schedule by which states are required to conduct sanitary surveys for *all* subpart H systems.

Subpart H systems serving at least 10,000 people must comply with the turbidity and monitoring requirements, the primary requirements of the IESWTR, no later than January 1, 2002. However, PWSs with elevated levels of DBPs (total trihalomethanes—TTHM; and five haloacetic acids—HAA5) are

required to develop an evaluation of their existing disinfection practices—a *disinfection profile*—no later than April 2001.

The timetable for the IESWTR is presented in Table 1. The compliance dates for the associated Stage 1 Disinfectants/Disinfection Byproducts Rule (Stage 1 DBPR) are January 2002 and January 2004. Subpart H systems that serve 10,000 or more people will have to comply with the provisions of the Stage 1 DBPR by January 2002. Subpart H systems that serve fewer than 10,000 people and all ground water systems will have to comply with the provisions of the rule by January 2004. The rules to provide additional microbial protection for small subpart H systems (Long Term 1 ESWTR) and ground water systems (Ground Water Rule) are scheduled to be finalized in Spring/Summer 2001, with compliance required by Spring/Summer 2004.

Table 1: Timetable for the IESWTR Requirements

Date	IESWTR Requirement
December 16, 1998	Rule is published in <i>Federal Register</i> [63 FR 241 69478].
February 16, 1999	60-day legal challenge period ends.
February 16, 1999	Construction of uncovered finished water storage facilities is prohibited [40 CFR 141.170(c)].
March 16, 1999	After this date, TTHM and HAA5 monitoring must begin for systems that do not have ICR or occurrence data and wish to determine if they must develop a disinfection profile [40 CFR 141.172(a)(2)(iii)].
April 16, 1999	Systems that have 4 consecutive quarters of HAA5 occurrence data that meet the TTHM monitoring requirements must submit those data to the state to determine if they must develop a disinfection profile [40 CFR 141.172(a)(5)(ii)].
December 31, 1999	TTHM and HAA5 data are due for those systems that collected data under the ICR to determine if they must develop a disinfection profile [40 CFR 141.172(a)(5)(i)].
December 31, 1999	Systems that elect to profile without conducting 4 quarters of TTHM and HAA5 monitoring must notify the state of their election [40 CFR 141.172(a)(5)(iv)].
December 31, 1999	Systems that wish to request state approval of “a more representative annual data set” than the ICR data set to determine if they must develop a disinfection profile must do so in writing [40 CFR 141.172(a)(5)(v)].
March 31, 2000	TTHM and HAA5 monitoring must be complete for systems determining if they must develop a disinfection profile [40 CFR 141.172(a)(2)(iii)(A)].
March 31, 2000	If system is using 3 years of existing operational data to develop the disinfection profile, the profile generated from these data and a request for state approval must be submitted [40 CFR 141.172(b)(3)(i)].
April 1, 2000	Systems determining if they must develop a disinfection profile must submit their TTHM and HAA5 data to the state [40 CFR 141.172(a)(5)(iii)].
April 1, 2000	Systems must begin developing a disinfection profile if either their annual average TTHM \leq 0.064 mg/L or their annual average HAA5 \leq 0.048 mg/L [40 CFR 141.172(b)(2)].
March 31, 2001	Disinfection profile is complete [40 CFR 141.172(b)(2)].

Date	IESWTR Requirement
March 31, 2001	After this date, systems that were required to develop a disinfection profile that wish to make a significant change to their disinfection practice must first calculate a disinfection benchmark and consult with the state [40 CFR 141.172(c)].
December 31, 2001	Systems that are not required to filter must comply with the requirements for TTHM in §141.12 and §141.30 until this date. After this date, systems must comply with the requirements in Subpart L for TTHM, HAA5, bromate, chlorite, chlorine, chloramines, and chlorine dioxide [40 CFR 141.71(b)(6)].
December 31, 2001	Systems that do not meet all of the criteria for avoiding filtration and use conventional/direct filtration must meet the turbidity requirements of the rule [0.3 NTU CFE (combined filter effluent) 95 percent of the time, at no time exceed 1 NTU] [40 CFR 141.173].
December 31, 2001	Alternative technologies for systems that serve at least 10,000 people must remove 99 percent of <i>Cryptosporidium</i> oocysts, and the state must establish alternative turbidity performance standards that must be met 95 percent of the time and a maximum [40 CFR 141.173(b)].
January 1, 2002	Systems must comply with the reporting and recordkeeping requirements of 40 CFR 141.175, including turbidity exceptions reporting. Systems must, when appropriate: <ul style="list-style-type: none"> • Produce filter profiles or identify obvious reason for poor filter performance. • Report profile has been produced or identify obvious reason for poor filter performance. • Conduct filter self-assessments. • Have 3rd party CPEs performed.
December 2004	State must have first round of sanitary surveys completed for Subpart H CWSs [40 CFR 142.16(b)(3)(i)].
December 2006	State must have first round of sanitary surveys completed for Subpart H NCWSs [40 CFR 142.16(b)(3)(i)].

3. Summary of Requirements

Disinfection profiling and benchmarking

Surface water or GWUDI systems having average annual TTHM ≤ 0.064 mg/L or annual average HAA5 ≤ 0.048 mg/L must develop a *disinfection profile*. The disinfection profile is a compilation of daily measurements of microbial inactivation by disinfection, collected over the period of 1 year. From the disinfection profile, the PWS calculates the average microbial inactivation potential for each month, and the lowest monthly average inactivation becomes the *disinfection benchmark*.

The purpose of these provisions is to provide a process whereby a public water system (PWS) and the state, working together, assure that there will be no significant reduction in microbial protection as the result of disinfection practice modifications designed to meet the more restrictive maximum contaminant levels (MCLs) for DBPs established in the Stage 1 DBPR. Those PWSs required to develop disinfection profiles, and that then wish to modify their disinfection practices to meet the new MCLs, must establish the disinfection benchmark and consult with the state prior to implementing such modifications. In addition, PWSs must keep the disinfection profile on file for the state to review during their sanitary surveys. The benchmark does not set a new regulatory floor for disinfection practice, but instead

characterizes current practice so that the system, in consultation with the state, can make an informed decision when implementing a modification.

Cryptosporidium

The IESWTR sets a maximum contaminant level goal (MCLG) of zero for the protozoan *Cryptosporidium*. It also establishes a requirement for 2-log (99%) removal of *Cryptosporidium* for systems that must currently filter under the SWTR. Systems that use conventional or direct filtration meet this requirement if they are in compliance with the strengthened turbidity performance standards for combined filter effluent in the IESWTR (discussed below). Systems that use slow sand or diatomaceous earth filtration meet the 2-log removal requirement if they are in compliance with the existing turbidity performance standards under the SWTR.

The IESWTR also extends the existing watershed control requirements for unfiltered systems to include the control of potential sources of *Cryptosporidium*. Such sources must be included in an unfiltered system's watershed control plan.

These new provisions, along with the new turbidity requirements, will better protect consumers from *Cryptosporidium* and other pathogens.

Strengthened turbidity requirements

The IESWTR includes a series of requirements related to turbidity. These requirements strengthen current SWTR requirements for combined filter effluent for systems that use conventional or direct filtration. The turbidity level of a system's combined filtered water at each plant must be less than or equal to 0.3 nephelometric turbidity units (NTUs) in at least 95 percent of the measurements taken each month, and the turbidity level of a system's combined filtered water must at no time exceed 1 NTU (under the SWTR, these turbidity requirements are 0.5 NTU and 5 NTU, respectively).

Individual filter monitoring requirements

The IESWTR requires continuous turbidity monitoring for individual filters. The rule requires that surface water and GWUDI systems that use conventional or direct filtration must conduct continuous turbidity monitoring (every 15 minutes) on the effluent of each individual filter. PWSs must report instances of poor filter performance to the state, and, based on performance triggers, must take prescribed actions to identify and correct the cause(s). This requirement will allow systems to identify filters whose poor performance might be masked in a combined filter effluent.

Uncovered finished water storage facilities

The rule prohibits building any uncovered finished water storage facilities (reservoir, holding tank, or other storage facility) for which construction begins after February 16, 1999. This provision will help limit recontamination of treated water, but does not require that existing uncovered finished water storage facilities be covered.

Public water system recordkeeping and reporting requirements

The IESWTR requires PWSs to submit combined filter effluent monitoring and compliance data and report that they have conducted individual filter turbidity monitoring to states within 10 days after the end of each month the system serves water to the public. Additionally, PWSs must report to the state if certain individual filter monitoring trigger levels are exceeded. In this case, systems must report turbidity

measurements and report that filter profiles, filter self-assessments, or Comprehensive Performance Evaluation (CPE) reports have been produced or conducted when instances of poor filter performance occur or persist based on monitoring of individual filter performance. Systems must maintain the results of individual filter monitoring for at least three years.

Sanitary surveys

The IESWTR requires that the state must conduct sanitary surveys for *all* PWSs using surface water or ground water under the direct influence of surface water (GWUDI), *regardless of the population served*, no less frequently than every 3 years for community water systems and every 5 years for noncommunity systems. For community water systems determined by the state in previous sanitary surveys to have “outstanding performance,” successive sanitary surveys may be conducted at up to 5-year intervals.

Unfiltered Systems

The IESWTR requires unfiltered systems to continue to meet the SWTR source water and site-specific requirements to remain unfiltered. In addition, unfiltered systems must include *Cryptosporidium* in their watershed control programs and must meet all Stage 1 DBPR MCLs and MRDLs to remain unfiltered. Like filtered systems, they are subject to disinfection profiling and benchmarking and sanitary surveys.

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/mbp/implement.html. Additional information on ordering these manuals is provided below.

The manuals for the IESWTR include:

Disinfection Profiling and Benchmarking Guidance Manual (EPA 815-R-99-013)

Objective: To help determine if a disinfection profile (an evaluation of current disinfection practice) is required and how to do one; when a disinfection benchmark must be determined and how to extract it from the profile; and how a public water system uses the benchmark, in consultation with the state, to protect from microbial risk when the system changes disinfection practice.

Contents: The manual provides detailed information on the following subjects: applicability of the profiling and benchmarking requirements to public water systems; procedures for generating a disinfection profile, including example profiles; methods for calculating the disinfection benchmark, including example calculations; the use of the benchmark in modifying disinfection practices, communicating with the state, and assessing significant changes to disinfection practices; the development of the profiling and benchmarking regulations; the significance of the log inactivation concept and CT values for inactivations achieved by various disinfectants; and the determination of contact time.

Guidance Manual for Compliance with the Interim Enhanced Surface Water Treatment Rule: Turbidity Provisions (EPA 815-R-99-010)

Objective: The first section provides technical information regarding specific requirements of the Interim Enhanced Surface Water Treatment Rule relating to turbidity and is intended for experienced operators and others in the regulated community. The second section of the document provides background on concepts surrounding turbidity and serves as a primer for less experienced operators and individuals.

Contents: The first section contains key regulatory requirements including combined filter effluent monitoring and individual filter monitoring; recordkeeping and reporting requirements; additional compliance issues such as compliance schedule, public notification, variances/exemptions, and follow-up action requirements; approved methods and additional measurement and calibration issues; components and description of a filter self-assessment; and components and description of a Comprehensive Performance Evaluation. The second section of the manual includes more basic information on turbidity; description of the particles (both natural and man-made) which typically contribute to turbidity; discussion of typical steps in a treatment process and how turbidity is removed or created in each step; discussion of turbidity in different source waters with an emphasis of how changes in source water effect turbidity; and basic turbidimeter design.

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 help evaluate 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 use in the United States and cost estimates for the use of alternative disinfectants.

Microbial and Disinfection Byproducts Simultaneous Compliance Manual (EPA 815-R-99-015)

Objective: To help public water systems achieve simultaneous compliance 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.

Guidance Manual for Conducting Sanitary Surveys of Public Water Systems: Surface Water and Ground Water Under the Direct Influence (GWUDI) (EPA 815-R-99-016)

Objective: The guidance manual provides an overview of how to conduct a sanitary survey of all water systems using surface water and ground water under the direct influence of surface water. It is intended to help state agencies improve their sanitary survey programs where needed.

Contents: The manual provides information about the objective and regulatory context of sanitary surveys. It covers four principal stages of a sanitary survey: planning, including preparatory steps to be taken by inspectors before conducting the onsite portion; conducting the onsite survey; compiling a sanitary survey report; and performing follow-up activities.

Uncovered Finished Water Reservoirs (EPA 815-R-99-011)

Objective: To provide information on ways systems can limit water quality degradation in existing finished water reservoirs.

Contents: The manual provides detailed information on the following subjects: developing and implementing comprehensive open finished water reservoir management plans based on site-specific conditions; identifying potential sources of contamination in open finished water reservoirs and potential mitigation measures; employing different methods to control the degradation of water quality while it resides in the reservoir; monitoring schemes that can be used to characterize water quality and identify water quality degradation before it becomes severe and is difficult to correct.

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 IESWTR applies only to subpart H systems that serve 10,000 or more people, with the exception of a sanitary survey provision that applies to all subpart H systems (the state or a third party conducts the sanitary survey). These systems are all required to monitor and report similar data, with the exception of turbidity exceedance reports that will be prepared as required.

Combined filter effluent turbidity monitoring

The Interim Enhanced Surface Water Treatment Rule (IESWTR) establishes a number of provisions related to the performance of filters used in drinking water treatment. These provisions include treatment technique requirements restricting turbidity levels in the combined filter effluent. These requirements are designed to decrease risk from waterborne microbial pathogens by limiting levels of particulate material in finished water. EPA has used a treatment technique because it is neither technically nor economically feasible to measure pathogens such as *Giardia*, *Cryptosporidium*, and viruses in either the source water or treated water.

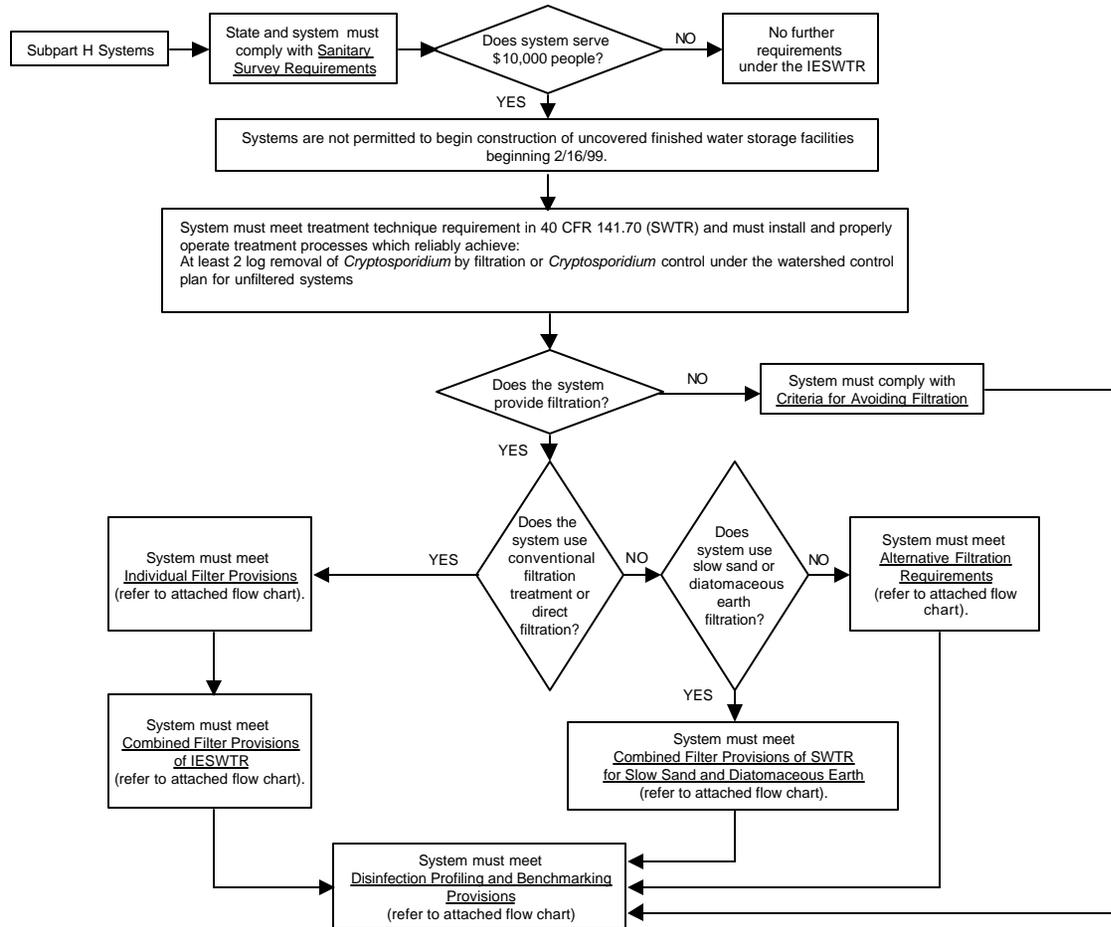
Which systems must comply with turbidity requirements for the combined filter effluent under the IESWTR?

The treatment technique requirements for combined filter effluent turbidity under the IESWTR apply to public water systems (PWS) that use surface water or ground water under the direct influence of surface water (GWUDI), serve 10,000 or more people, and are required to filter.

What are the maximum allowable levels of turbidity in the combined filter effluent?

For systems using conventional filtration or direct filtration, the turbidity level of representative samples of a system's filtered water must be less than or equal to 0.3 NTU in at least 95 percent of the measurements taken each month, and must never exceed 1 NTU. For slow sand and diatomaceous earth filtration systems, requirements for turbidity levels in the combined filter effluent remain as specified under the SWTR (less than or equal to 1 NTU in 95 percent of the measurements taken each month and never greater than 5 NTU). For systems using filtration technologies other than conventional, direct, slow sand, or diatomaceous earth, the systems must demonstrate to the state, using pilot plant studies or

General Requirements (1998 IESWTR)



other means, that the alternative filtration technology in combination with disinfection treatment consistently achieves 99.9 percent removal and/or inactivation of *Giardia lamblia* cysts, 99.99 percent removal and/or inactivation of viruses, and 99 percent removal of *Cryptosporidium* oocysts. For each approval of an alternative filtration technology, the state will set turbidity performance requirements that the system must meet at least 95 percent of the time, and that the system may not exceed at any time, at values that consistently achieve these levels of removal and/or inactivation of *Giardia lamblia*, viruses, and *Cryptosporidium*. Failure to meet these requirements is a treatment technique violation.

What are the monitoring requirements for combined filter effluent turbidity?

Systems must monitor combined filter effluent turbidity as specified under the SWTR. This specifies that turbidity measurements must be performed on representative samples of the system’s filtered water every four hours (or more frequently) that the system serves water to the public. A public water system may substitute continuous turbidity monitoring for grab sample monitoring if it validates the continuous measurement for accuracy on a regular basis using a protocol approved by the state. For any systems using slow sand filtration or filtration treatment other than conventional treatment, direct filtration, or diatomaceous earth filtration, the state may reduce the sampling frequency to once per day if it determines that less frequent monitoring is sufficient to indicate effective filtration performance. Turbidity must be measured using methods approved by EPA and by a party approved by the state. A system that uses lime softening may acidify representative samples prior to analysis using a protocol approved by the state. Failure to meet these requirements is a monitoring violation.

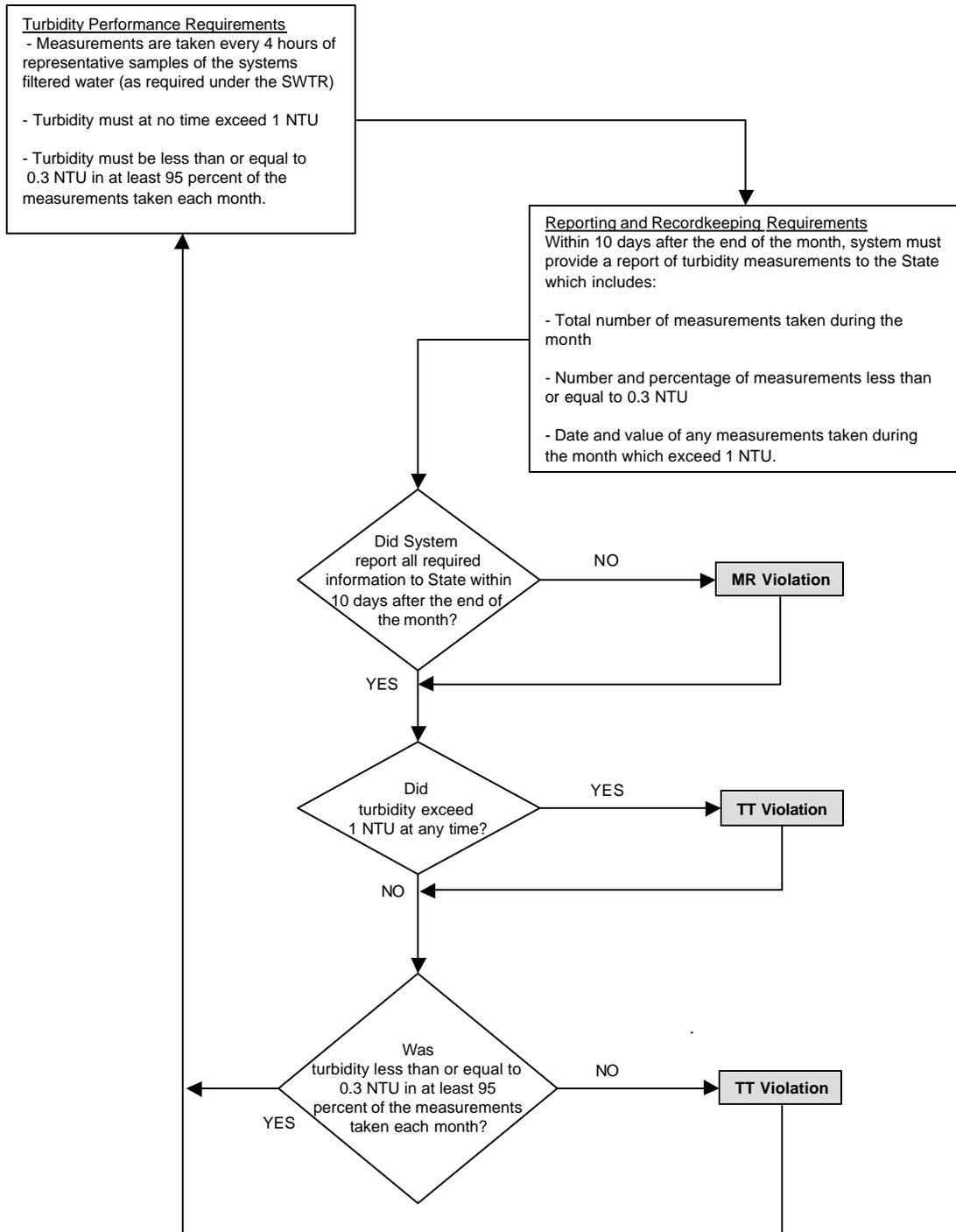
What are the reporting and recordkeeping requirements for turbidity in the combined filter effluent?

The reporting requirements for combined filter effluent turbidity are unchanged from those established under the SWTR, except where reporting levels have been modified to reflect more stringent turbidity requirements established under the IESWTR. Required turbidity measurements must be reported within 10 days after the end of each month the system serves water to the public. Information that must be reported includes: 1) the total number of filtered water turbidity measurements taken during the month; 2) the number and percentage of filtered water turbidity measurements taken during the month which are less than or equal to the turbidity limits established under the SWTR for diatomaceous earth and slow sand filtration systems, and under the IESWTR for conventional, direct, and alternative filtration systems; and 3) the date and value of any turbidity measurements taken during the month which exceed 1 NTU for conventional and direct filtration systems, 5 NTU for slow sand and diatomaceous earth filtration systems, and the maximum level established by the state for alternative filtration technology systems. Failure to meet these requirements is a reporting/recordkeeping violation.

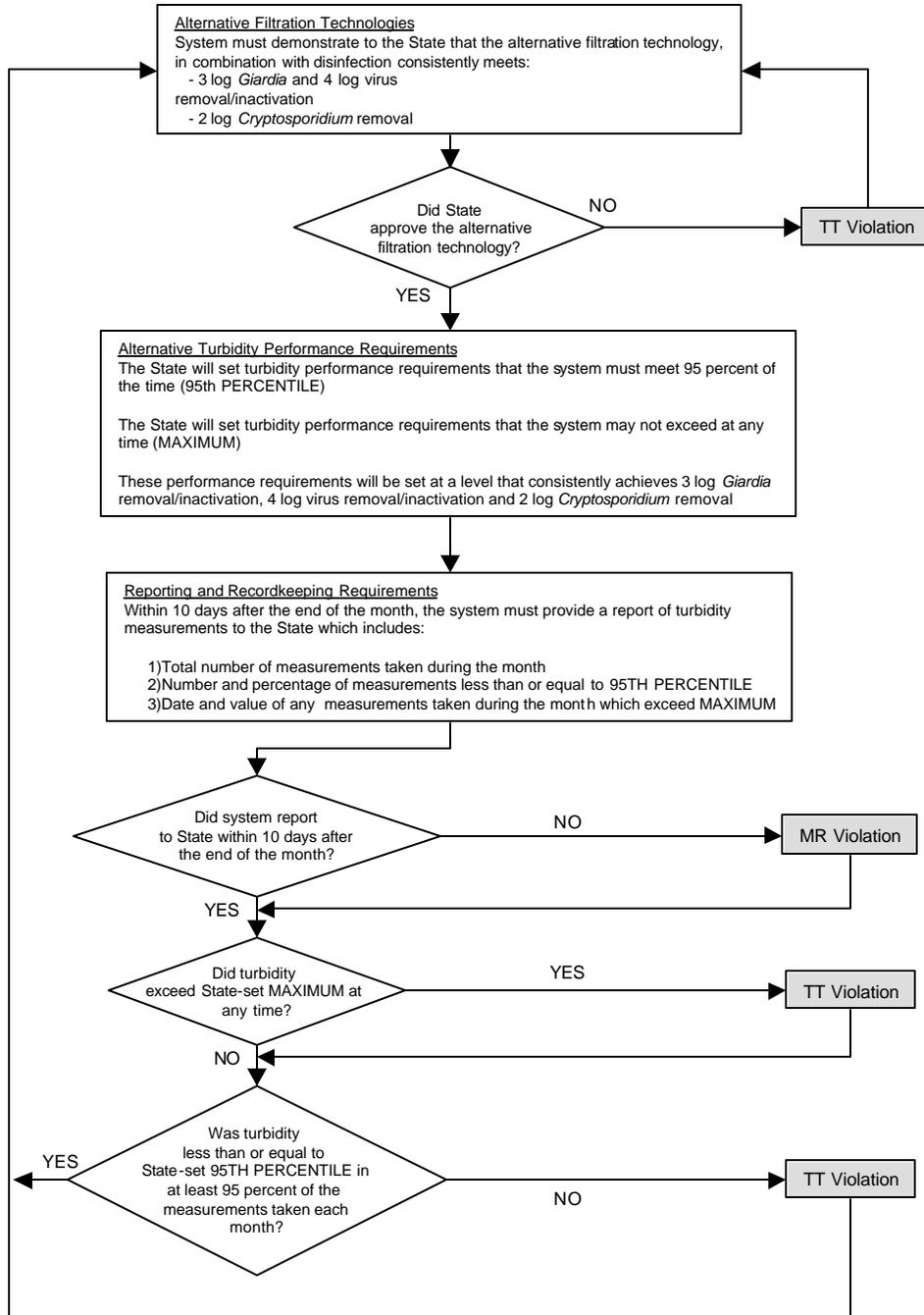
**IESWTR COMBINED FILTER EFFLUENT TURBIDITY
COMPLIANCE REQUIREMENTS**

FILTRATION TECHNOLOGY	95th PERCENTILE TURBIDITY (NTU)	MAXIMUM TURBIDITY (NTU)
Conventional filtration	0.3	1
Direct filtration	0.3	1
Diatomaceous earth filtration	1	5
Slow sand filtration	1	5
Filtration technologies not listed above	as determined by the state	as determined by the state

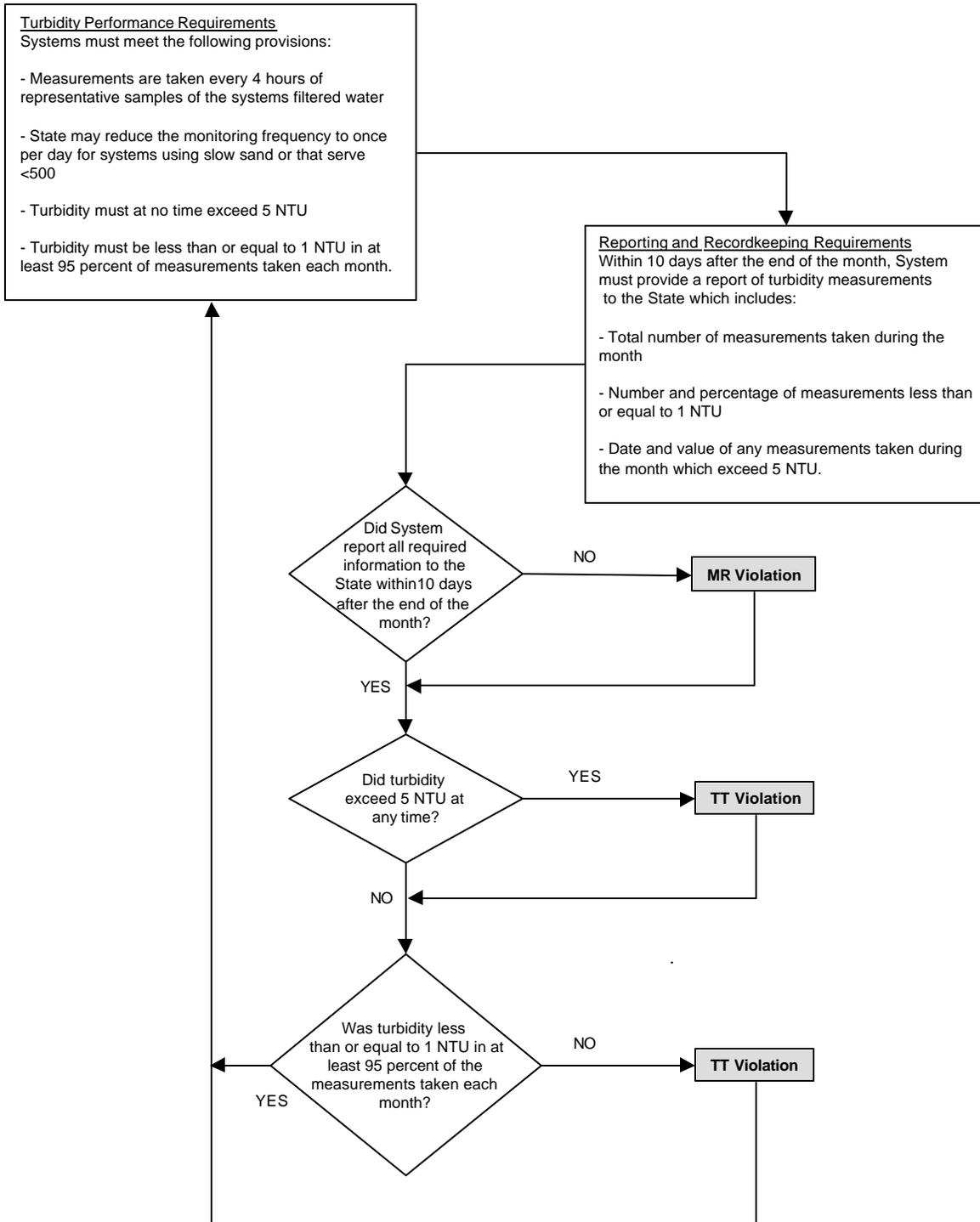
**Combined Filter Effluent Provisions of IESWTR
(Applicable to Conventional and Direct Filtration Systems)**



Alternative Filtration Requirements of the IESWTR
(Filtration Technologies other than conventional, direct, slow sand or diatomaceous earth)



**Combined Filter Effluent Provisions of SWTR
(Applicable to Systems using Slow Sand and Diatomaceous Earth Filtration)**



Individual filter turbidity monitoring

The IESWTR establishes a number of requirements related to the performance of filters used in drinking water treatment. Included in these requirements are provisions mandating that certain systems monitor the effluent of individual filters. These provisions are designed to decrease the risk of microbial pathogen contamination of finished waters by focusing greater attention on the performance of individual filters.

Which systems are required to monitor individual filters?

The filtration requirements of the IESWTR apply to PWSs that use surface water or GWUDI, serve 10,000 or more people, and are required to filter. Systems that provide conventional or direct filtration treatment must monitor individual filters.

What are the monitoring requirements for individual filters?

Systems must continuously measure the effluent turbidity of each individual filter using a method approved by EPA, and must record the results every 15 minutes. If there is a failure in the continuous turbidity monitoring equipment, the system must conduct grab sampling every four hours in lieu of continuous monitoring until the turbidimeter is repaired or replaced, and is in violation if the turbidimeter is not replaced or repaired within five working days following the failure of the equipment. Failure to comply with these requirements is a monitoring violation.

What are the reporting and recordkeeping requirements for individual filter monitoring?

Systems required to monitor individual filters must maintain the results of this monitoring for at least 3 years. Within 10 days after the end of each month, these systems must make a report to the state that they have conducted individual filter turbidity monitoring. Systems must report individual filter turbidity measurements only if the measurements demonstrate any of the following four exceedance conditions:

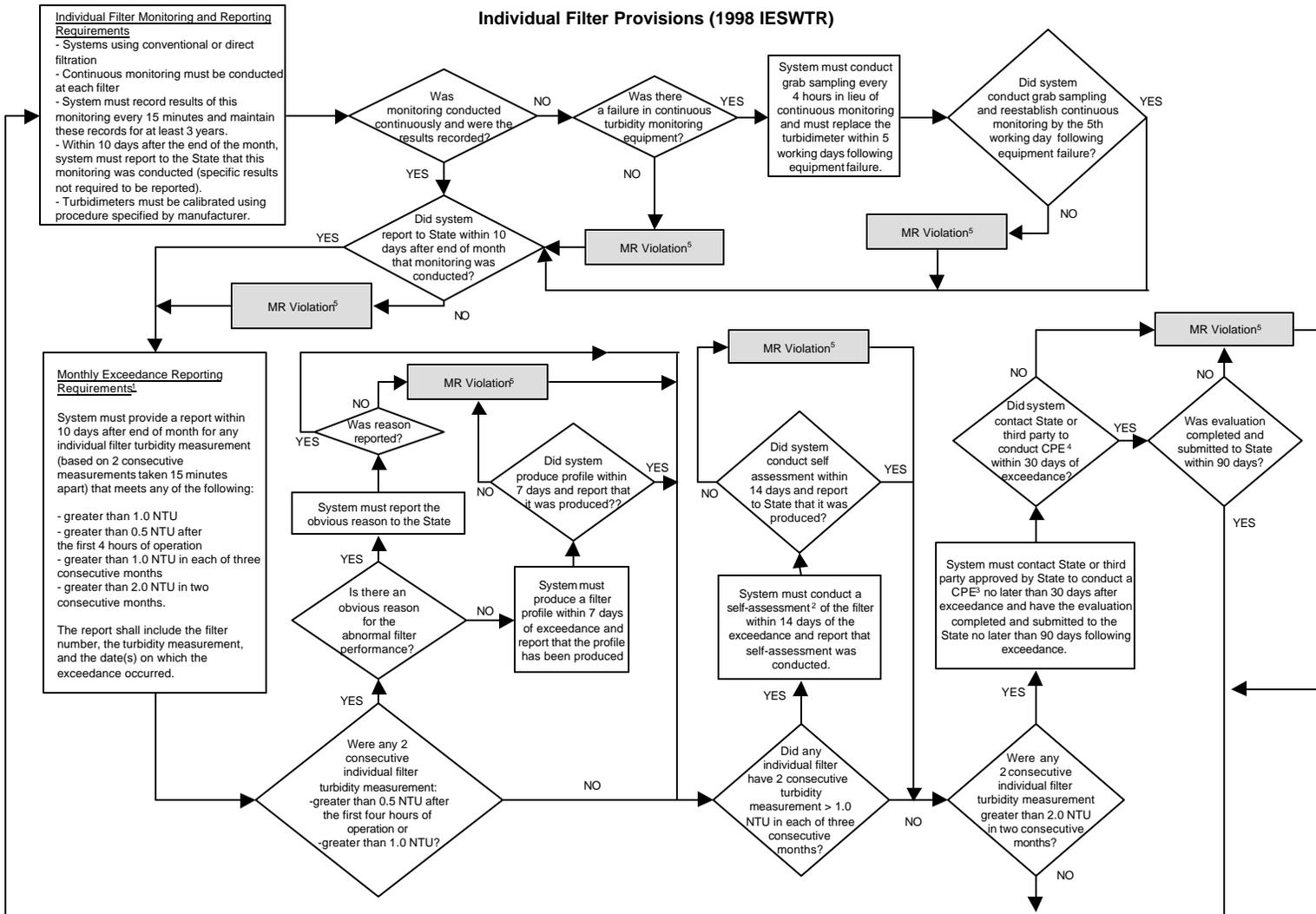
- 1) Any individual filter that has a measured turbidity level of greater than 1.0 NTU in two consecutive measurements taken 15 minutes apart. The system must report the filter number, the turbidity measurement, and the date(s) on which the exceedance occurred. The system must also either identify and report an obvious reason for the exceedance or produce a filter profile for the filter within 7 days of the exceedance and report that the profile has been produced. (A filter profile is a graphical representation of turbidity or total particle counts as a function of time for an entire filter run. A discussion of filter profiles is included in EPA's guidance document on turbidity.)
- 2) Any individual filter that has a measured turbidity level of greater than 0.5 NTU in two consecutive measurements taken 15 minutes apart at the end of the first four hours of continuous filter operation after the filter has been backwashed or otherwise taken offline. The system must report the filter number, the turbidity measurement, and the date(s) on which the exceedance occurred. The system must also either identify and report an obvious reason for the exceedance or produce a filter profile for the filter within 7 days of the exceedance and report that the profile has been produced. (A filter profile is a graphical representation of turbidity or total particle counts as a function of time for an entire filter run. A discussion of filter profiles is included in EPA's guidance document on turbidity.)
- 3) Any individual filter that has a measured turbidity level of greater than 1.0 NTU in two consecutive measurements taken 15 minutes apart at any time in each of three consecutive months. The system must report the filter number, the turbidity measurement, and the date(s) on which the exceedance occurred. The system must conduct a self-assessment of the filter within 14 days of the exceedance and report that

the self-assessment was conducted in the monthly report. The self-assessment must consist of at least the following components: assessment of filter performance, development of a filter profile, identification and prioritization of factors limiting filter performance, assessment of the applicability of corrections, and preparation of a filter self-assessment report.

- 4) Any individual filter that has a measured turbidity level greater than 2.0 NTU in two consecutive measurements taken 15 minutes apart at any time in each of two consecutive months. The system must report the filter number, the turbidity measurement, and the date(s) on which the exceedance occurred. The system must arrange for the conduct of a comprehensive performance evaluation (CPE) by the state or a third part approved by the state no later than 30 days following the exceedance. (A CPE is a thorough review and analysis of a treatment plant's performance-based capabilities and associated administrative, operation and maintenance practices.) The CPE must be completed and submitted to the state no later than 90 days following the exceedance.

The turbidity guidance manual has detailed information about filter profiling, filter self-assessments, and CPEs. Systems using lime softening may apply to the state for alternative exceedance levels to those specified above if they can demonstrate that higher turbidity levels in individual filters are due to lime carryover only and not due to degraded filter performance.

Failure to comply with these requirements is a reporting violation. However, the exceedance criteria are not treatment technique requirements, and systems have not committed a violation solely by demonstrating any of the exceedance conditions in their individual filters.



NOTES

- ¹ Systems that use lime softening may apply to the State for alternative exceedance levels if they can demonstrate that higher levels are due to lime carry-over only and not due to degraded filter performance.
- ² A self-assessment must consist of at least the following components 1). assessment of filter performance; 2). development of filter profile; 3). identification and prioritization of factors limiting performance; 4). Assessment of the applicability of corrections; and 5). Preparation of filter assessment report.
- ³ CPE: Comprehensive Performance Evaluation.
- ⁴ State has the authority to require full Composite Correction Program (CCP) which consists of CPE and Comprehensive Technical Assistance (CTA).
- ⁵ System has MR violation until relevant task is completed (e.g., filter profile produced).

What ROUTINE MONITORING must I conduct under the IESWTR?

What do I have to REPORT to the State?

IMPORTANT: The information in the table below *does not* include the requirements for determining profiling applicability, disinfection profiling, and disinfection benchmarking. Please refer to the section on Disinfection Benchmarking for these monitoring and sampling requirements.

Activity	Requirement
Combined filter effluent monitoring	All systems must continue to monitor the combined filter effluent at the same location and frequency as under the SWTR.
Turbidity Monitoring at Individual Filters	<ul style="list-style-type: none"> • All systems using conventional filtration treatment or direct filtration must conduct continuous turbidity monitoring for each individual filter using an approved method and Individual must calibrate turbidimeters using the procedure specified by the manufacturer. • Systems must record the results of individual filter monitoring every 15 minutes. • If there is a failure in the continuous turbidity monitoring equipment, the system must conduct grab sampling every 4 hours in lieu of continuous monitoring .
Triggers for Turbidity Exceptions Reporting for Individual Filters	<ul style="list-style-type: none"> • For any individual filter that has a measured turbidity level of greater than 1.0 NTU in 2 consecutive measurements taken 15 minutes apart, the system must report the filter number, turbidity measurement, and date of exceedance. The system must produce a filter profile for the filter within 7 days of the exceedance and report that the profile has been produced or report the obvious reason for the exceedance. • For any individual filter that has a measured turbidity level of greater than 0.5 NTU in 2 consecutive measurements taken 15 minutes apart after the first 4 hours of operation after the filter has been backwashed or otherwise taken offline, the system must report the filter number, turbidity measurement, and date of exceedance. The system must produce a filter profile for the filter within 7 days of the exceedance and report that the profile has been produced or report the obvious reason for the exceedance. • For any individual filter that has a measured turbidity level of greater than 1.0 NTU in 2 consecutive measurements taken 15 minutes apart in each of 3 consecutive months, the system must report the filter number, turbidity measurement, and date of exceedance. The system must conduct a self-assessment of the filter within 14 days of the exceedance and report that the self-assessment was conducted. • For any individual filter that has a measured turbidity level of greater than 2.0 NTU in 2 consecutive measurements taken 15 minutes apart in 2 consecutive months, the system must report the filter number, turbidity measurement, and date of exceedance. The system must contact the state or 3rd party to conduct a CPE no later than 30 days following the exceedance and have the evaluation completed and submitted to the state no later than 90 days following the exceedance.
Reporting and Recordkeeping	<p><u>Individual Filter Data</u></p> <ul style="list-style-type: none"> • Results of individual filter monitoring must be maintained for at least 3 years. • Individual filter data must be reported only if there has been a turbidity exceedance <p><u>Combined Filter Effluent Data Reporting</u></p> <ul style="list-style-type: none"> • Total number of combined filter effluent turbidity measurements taken during last month that do not exceed the turbidity limits. • Date and value of any turbidity measurements taken during the month that exceed 1 NTU for systems using conventional or direct filtration. • Turbidity measurements must be reported within 10 days after the end of each month the system serves water to the public.

Disinfection profiling and benchmarking

The Interim Enhanced Surface Water Treatment Rule (IESWTR) establishes disinfection benchmarking as a procedure requiring certain public water systems (PWSs) to evaluate the impact on microbial risk of proposed changes in disinfection practice. It is designed to help utilities and states work together to assure that pathogen control is maintained while the provisions of the Stage 1 Disinfectants and Disinfection Byproducts Rule (Stage 1 DBPR) are implemented. This procedure involves a PWS charting daily levels of pathogen inactivation for a period of at least one year to create a profile of inactivation performance. The PWS then uses this profile to determine a baseline or benchmark of inactivation against which proposed changes in disinfection practices can be measured. Profiling and benchmarking is explained in detail in the [Disinfection Profiling and Benchmarking Guidance Manual](#).

Who is required to prepare a disinfection profile?

Surface water or GWUDI systems having average annual TTHM ≤ 0.064 mg/L or annual average HAA5 ≤ 0.048 mg/L as a result of data or specific monitoring conducted by March 31, 2000 must develop a *disinfection profile*. These levels, equal to 80% of the MCLs established for these compounds by the Stage 1 DBPR, are intended to include most systems that will modify their disinfection practices to comply with the Stage 1 DBPR. To determine applicability, systems that collected TTHM and HAA5 data under the ICR must use the results of the last 12 months of ICR monitoring unless the state determines there is a more representative data set. Non ICR systems may either use existing TTHM and HAA5 data, if approved by the state, or must conduct TTHM and HAA5 monitoring for four quarters. This monitoring must be completed before April 2000. Alternatively, systems can elect to forgo this monitoring if they construct a disinfection profile.

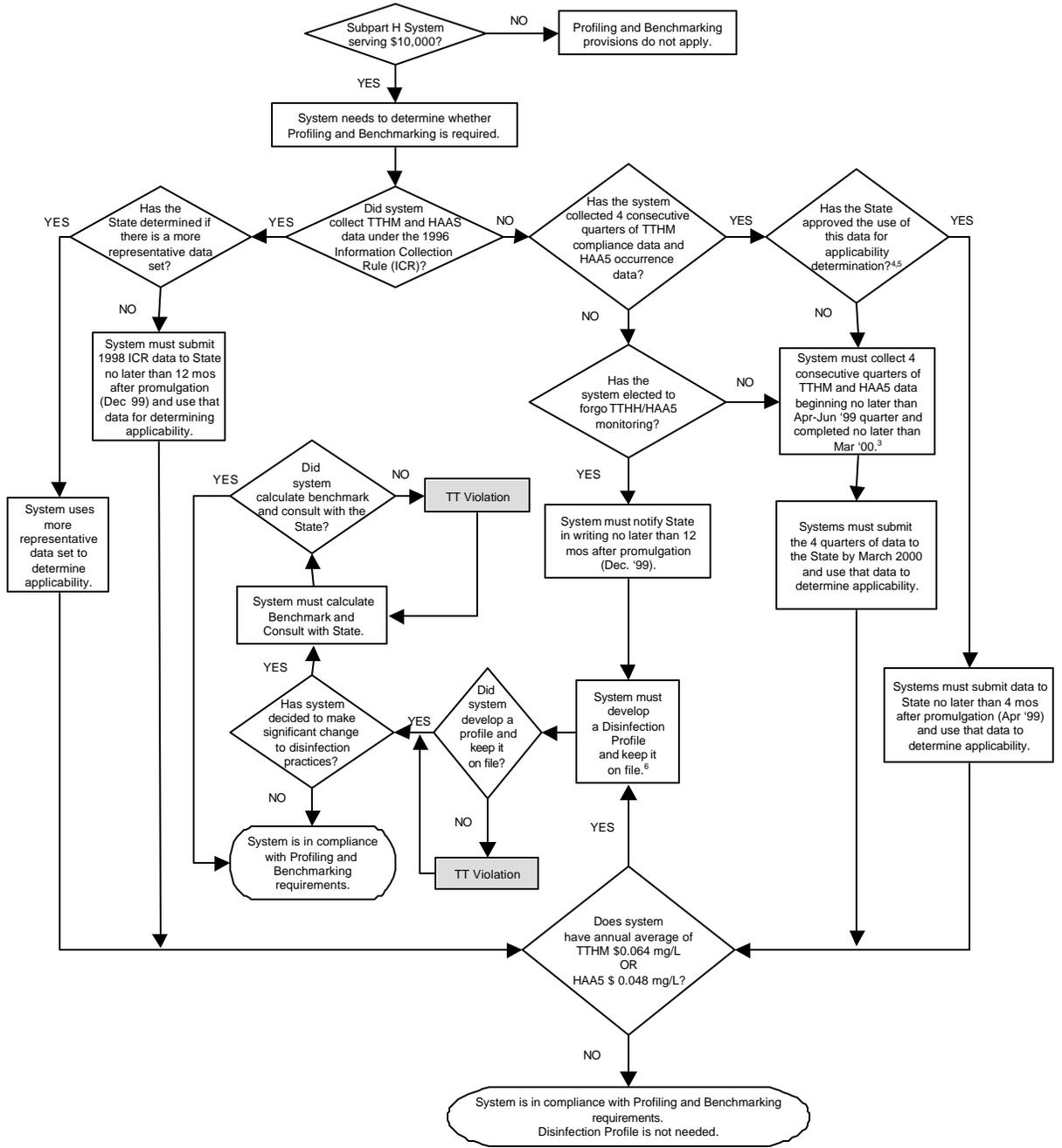
How are the disinfection profile and benchmark developed?

A disinfection profile consists of a compilation of daily *Giardia lamblia* log inactivations (plus virus inactivations for systems using either chloramines or ozone for primary disinfection) computed over a period of at least one year through the entire treatment plant. It is based on daily measurements of disinfectant residual concentration(s), contact time(s), temperature, and pH. A system with more than one point of disinfection application must conduct this monitoring for each disinfection segment. The profile may also be developed using up to 3 years of existing (i.e. grandfathered) data if the state finds the data acceptable. Systems having less than 3 years of acceptable grandfathered data are required to conduct one year of monitoring to create the profile. This monitoring must be completed by April 2001. The disinfection benchmark is equal to the lowest monthly average inactivation level in the disinfection profile (or average of low months for multi-year profiles).

How are the disinfection profile and benchmark used?

Any system required to develop a disinfection profile under the IESWTR that decides to make a significant change to its disinfection practice must calculate its benchmark and consult with the state prior to and only if making a significant change. Significant changes in disinfection practice are defined as: 1) changes to the point of disinfection; 2) changes to the disinfectant(s) used in the treatment plant; 3) changes to the disinfection process; and 4) any other modification identified by the state. As part of the consultation process, the system must submit to the state the following information: a description of the proposed change; the disinfection profile for *Giardia lamblia* (and, if necessary, viruses) and benchmark; and an analysis of how the proposed change will affect the current levels of disinfection. In addition, the state is required to review the disinfection profile as part of its periodic sanitary survey.

Disinfection Profiling and Benchmarking Provisions (1998 IESWTR)



NOTES

- ¹TTHM and HAA5 averages must be taken from same time period.
- ²Any lab approved under the ICR or using ICR-approved methods may conduct HAA5 analyses.
- ³TTHM and HAA5 monitoring must meet same sampling number and location requirements as TTHM in 141.12 and 141.30; and same handling and analytical requirements as the ICR in 141.142(b)(1).
- ⁴System must conduct HAA5 monitoring until state approves of the existing data.
- ⁵State may also require a more representative data set.
- ⁶Disinfection Profile must be kept on file for State to review during Sanitary Survey.

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Appendix E

IESWTR Rule Language

This appendix contains the rule language for the IESWTR incorporating the technical amendments. Changes to the original rule language are shown as highlighted text. A complete electronic copy of the IESWTR including preamble as published on December 16, 1998, can be found on the EPA web site at www.epa.gov/ogwdw/mdbp/ieswtrfr.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.

<u>40 CFR Citation</u>	<u>OMB Control No.</u>
*	*

National Primary Drinking Water Regulations

*	*
<i>141.170</i>	<i>2040-0205</i>
<i>141.172</i>	<i>2040-0205</i>
<i>141.174</i>	<i>2040-0205</i>
<i>141.174 (a) - (b)</i>	<i>2040-0205</i>
<i>141.175</i>	<i>2040-0205</i>
<i>141.175 (a) - (b)</i>	<i>2040-0205</i>
<i>141.175 (c)</i>	<i>2040-0090</i>
*	*

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 revising the definition of “ground water under the direct influence of surface water” and adding the following definitions in alphabetical order to read as follows:

§141.2 Definitions.

* * * * *

Comprehensive performance evaluation (CPE) is a thorough review and analysis of a treatment plant’s performance-based capabilities and associated administrative, operation and maintenance practices. It is conducted to identify factors that may be adversely impacting a plant’s capability to achieve compliance and emphasizes approaches that can be implemented without significant capital improvements. For purposes of compliance with subpart P of this part, the comprehensive performance evaluation must consist of at least the following components: assessment of plant performance; evaluation of major unit processes; identification and prioritization of performance limiting factors; assessment of the applicability of comprehensive technical assistance; and preparation of a CPE report.

* * * * *

Disinfection profile is a summary of daily Giardia lamblia inactivation through the treatment plant. The procedure for developing a disinfection profile is contained in §141.172.

* * * * *

Filter profile is a graphical representation of individual filter performance, based on continuous turbidity measurements or total particle counts versus time for an entire filter run, from startup to backwash inclusively, that includes an assessment of filter performance while another filter is being backwashed.

* * * * *

Ground water under the direct influence of surface water means any water beneath the surface of the ground with significant occurrence of insects or other macroorganisms, algae, or large-diameter pathogens such as Giardia lamblia or (for subpart H systems serving at least 10,000 people only) Cryptosporidium, or significant and relatively rapid shifts in water characteristics such as turbidity, temperature, conductivity, or pH which closely correlate to climatological or surface water conditions. Direct influence must be determined for individual sources in accordance with criteria established by the State. The State determination of direct influence may be based on site-specific measurements of water quality and/or documentation of well construction characteristics and geology with field evaluation.

* * * * *

Uncovered finished water storage facility is a tank, reservoir, or other facility used to store water that will undergo no further treatment except residual disinfection and is open to the atmosphere.

* * * * *

5. Section 141.32 is amended by revising paragraph (e)(10) to read as follows:

§141.32 Public notification.

* * * * *

(e) ***

(10) Microbiological contaminants (for use when there is a violation of the treatment technique requirements for filtration and disinfection in subpart H or subpart P of this part). The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that the presence of microbiological contaminants are a health concern at certain levels of exposure. If water is inadequately treated, microbiological contaminants in that water may cause disease. Disease symptoms may include diarrhea, cramps, nausea, and possibly jaundice, and any associated headaches and fatigue. These symptoms, however, are not just associated with disease-causing organisms in drinking water, but also may be caused by a number of factors other than your drinking water. EPA has set enforceable requirements for treating drinking water to reduce the risk of these adverse health effects. Treatment such as filtering and disinfecting the water removes or destroys microbiological contaminants. Drinking water which is treated to meet EPA requirements is associated with little to none of this risk and should be considered safe.

* * * * *

6. In Section 141.52, the table is amended by adding a new entry, in numerical order, to read as follows:

§141.52 Maximum contaminant level goals for microbiological contaminants.

* * * * *

<u>Contaminant</u>	<u>MCLG</u>
***	***
(5) <u>Cryptosporidium</u>	zero

7. Section 141.70 is amended by adding paragraph (d) to read as follows:

§141.70 General requirements.

* * * * *

(d) Additional requirements for systems serving at least 10,000 people. In addition to complying with requirements in this subpart, systems serving at least 10,000 people must also comply with the requirements in subpart P **of this part.**

8. Section 141.71 is amended by revising paragraph (b)(6) to read as follows:

§141.71 Criteria for avoiding filtration.

* * * * *

(b) ***

(6) The public water system must comply with the requirements for trihalomethanes in §§141.12 and 141.30 until **December 31, 2001**. After **December 31, 2001**, the system must comply with the requirements for total trihalomethanes, haloacetic acids (five), bromate, chlorite, chlorine, chloramines, and chlorine dioxide in subpart L.

* * * * *

9. Section 141.73 is amended by adding paragraph (a)(3) and revising paragraph (d) to read as follows:

§141.73 Filtration.

* * * * *

(a) ***

(3) Beginning **January 1, 2002**, systems serving at least 10,000 people must meet the turbidity requirements in §141.173(a).

* * * * *

(d) Other filtration technologies. A public water system may use a filtration technology not listed in paragraphs (a) through (c) of this section if it demonstrates to the State, using pilot plant studies or other means, that the alternative filtration technology, in combination with disinfection treatment that meets the requirements of §141.72(b), consistently achieves 99.9 percent removal and/or inactivation of Giardia lamblia cysts and 99.99 percent removal and/or inactivation of viruses. For a system that makes this demonstration, the requirements of paragraph (b) of this section apply. Beginning **January 1, 2002**, systems serving at least 10,000 people must meet the requirements for other filtration technologies in §141.173(b).

10. Section 141.153 is amended by revising paragraph (d)(4)(v)(C) to read as follows:

§141.153 Content of the reports.

* * * * *

(d) ***

(4) ***

(v) ***

(C) When it is reported pursuant to §§141.73 or 141.173: the highest single measurement and the lowest monthly percentage of samples meeting the turbidity limits specified in §§141.73 or 141.173 for the filtration technology being used. ***

* * * * *

11. Part 141 is amended by adding a new subpart P to read as follows:

Subpart P-Enhanced Filtration and Disinfection

Sec.

- 141.170 General requirements.
- 141.171 Criteria for avoiding filtration.
- 141.172 Disinfection profiling and benchmarking.
- 141.173 Filtration.
- 141.174 Filtration sampling requirements.
- 141.175 Reporting and recordkeeping requirements.

§141.170 General requirements.

(a) The requirements of subpart P constitute national primary drinking water regulations. These regulations establish requirements for filtration and disinfection that are in addition to criteria under which filtration and

disinfection is required under subpart H. The requirements of this subpart are applicable to subpart H systems serving at least 10,000 people, beginning **January 1, 2002** unless otherwise specified in this subpart. The regulations in this subpart establish or extend treatment technique requirements in lieu of maximum contaminant levels for the following contaminants: Giardia lamblia, viruses, heterotrophic plate count bacteria, Legionella, Cryptosporidium, and turbidity. Each subpart H system serving at least 10,000 people must provide treatment of its source water that complies with these treatment technique requirements and are in addition to those identified in §141.70. The treatment technique requirements consist of installing and properly operating water treatment processes which reliably achieve:

(1) At least 99 percent (2-log) removal of Cryptosporidium between a point where the raw water is not subject to recontamination by surface water runoff and a point downstream before or at the first customer for filtered systems, or Cryptosporidium control under the watershed control plan for unfiltered systems.

(2) Compliance with the profiling and benchmark requirements under the provisions of §141.172.

(b) A public water system subject to the requirements of this subpart is considered to be in compliance with the requirements of paragraph (a) of this section if:

(1) It meets the requirements for avoiding filtration in §§141.71 and 141.171 and the disinfection requirements in §§141.72 and 141.172 ; or

(2) It meets the applicable filtration requirements in either §141.173 or §141.73 and the disinfection requirements in §§141.72 and 141.172.

(c) Systems are not permitted to begin construction of uncovered finished water storage facilities beginning February 16, 1999.

§141.171 Criteria for avoiding filtration.

In addition to the requirements of §141.71, a public water system subject to the requirements of this subpart that does not provide filtration must meet all of the conditions of paragraphs (a) and (b) of this section.

(a) Site-specific conditions. In addition to site-specific conditions in §141.71(b), systems must maintain the watershed control program under §141.71(b)(2) to minimize the potential for contamination by Cryptosporidium oocysts in the source water. The watershed control program must, for Cryptosporidium:

(1) Identify watershed characteristics and activities which may have an adverse effect on source water quality; and

(2) Monitor the occurrence of activities which may have an adverse effect on source water quality.

(b) During the onsite inspection conducted under the provisions of §141.71(b)(3), the State must determine whether the watershed control program established under §141.71(b)(2) is adequate to limit potential contamination by Cryptosporidium oocysts. The adequacy of the program must be based on the comprehensiveness of the watershed review; the effectiveness of the system's program to monitor and control detrimental activities occurring in the watershed; and the extent to which the water system has maximized land ownership and/or controlled land use within the watershed.

§141.172 Disinfection profiling and benchmarking.

(a) Determination of systems required to profile. A public water system subject to the requirements of this subpart must determine its TTHM annual average using the procedure in paragraph (a)(1) of this section and its HAA5 annual average using the procedure in paragraph (a)(2) of this section. The annual average is the arithmetic average of the quarterly averages of four consecutive quarters of monitoring.

(1) The TTHM annual average must be the annual average during the same period as is used for the HAA5 annual average.

(i) Those systems that collected data under the provisions of subpart M (Information Collection Rule) must use the results of the samples collected during the last four quarters of required monitoring under §141.142.

(ii) Those systems that use “grandfathered” HAA5 occurrence data that meet the provisions of paragraph (a)(2)(ii) of this section must use TTHM data collected at the same time under the provisions of §§141.12 and 141.30.

(iii) Those systems that use HAA5 occurrence data that meet the provisions of paragraph (a)(2)(iii)(A) of this section must use TTHM data collected at the same time under the provisions of §§141.12 and 141.30.

(2) The HAA5 annual average must be the annual average during the same period as is used for the TTHM annual average.

(i) Those systems that collected data under the provisions of subpart M (Information Collection Rule) must use the results of the samples collected during the last four quarters of required monitoring under §141.142.

(ii) Those systems that have collected four quarters of HAA5 occurrence data that meets the routine monitoring sample number and location requirements for TTHM in §§141.12 and 141.30 and handling and analytical method requirements of §141.142(b)(1) may use those data to determine whether the requirements of this section apply.

(iii) Those systems that have not collected four quarters of HAA5 occurrence data that meets the provisions of either paragraph (a)(2)(i) or (ii) of this section by **March 16, 1999** must either:

(A) Conduct monitoring for HAA5 that meets the routine monitoring sample number and location requirements for TTHM in §§141.12 and 141.30 and handling and analytical method requirements of §141.142(b)(1) to determine the HAA5 annual average and whether the requirements of paragraph (b) of this section apply. This monitoring must be completed so that the applicability determination can be made no later than **March 31, 2000**, or

(B) Comply with all other provisions of this section as if the HAA5 monitoring had been conducted and the results required compliance with paragraph (b) of this section.

(3) The system may request that the State approve a more representative annual data set than the data set determined under paragraph (a)(1) or (2) of this section for the purpose of determining applicability of the requirements of this section.

(4) The State may require that a system use a more representative annual data set than the data set determined under paragraph (a)(1) or (2) of this section for the purpose of determining applicability of the requirements of this section.

(5) The system must submit data to the State on the schedule in paragraphs (a)(5)(i) through (v) of this section.

(i) Those systems that collected TTHM and HAA5 data under the provisions of subpart M (Information Collection Rule), as required by paragraphs (a)(1)(i) and (a)(2)(i) of this section, must submit the results of the samples collected during the last 12 months of required monitoring under §141.142 not later than **December 31, 1999**.

(ii) Those systems that have collected four consecutive quarters of HAA5 occurrence data that meets the routine monitoring sample number and location for TTHM in §§141.12 and 141.30 and handling and analytical method requirements of §141.142(b)(1), as allowed by paragraphs (a)(1)(ii) and (a)(2)(ii) of this section, must submit those data to the State not later than **April 16, 1999**. Until the State has approved the data, the system must conduct monitoring for HAA5 using the monitoring requirements specified under paragraph (a)(2)(iii) of this section.

(iii) Those systems that conduct monitoring for HAA5 using the monitoring requirements specified by paragraphs (a)(1)(iii) and (a)(2)(iii)(A) of this section, must submit TTHM and HAA5 data not later than **April 1, 2000**.

(iv) Those systems that elect to comply with all other provisions of this section as if the HAA5 monitoring had been conducted and the results required compliance with this section, as allowed under paragraphs (a)(2)(iii)(B) of this section, must notify the State in writing of their election not later than **December 31, 1999**.

(v) If the system elects to request that the State approve a more representative annual data set than the data set determined under paragraph (a)(2)(i) of this section, the system must submit this request in writing not later than **December 31, 1999**.

(6) Any system having either a TTHM annual average \$0.064 mg/L or an HAA5 annual average \$0.048 mg/L during the period identified in paragraphs (a)(1) and (2) of this section must comply with paragraph (b) of this section.

(b) Disinfection profiling. (1) Any system that meets the criteria in paragraph (a)(6) of this section must develop a disinfection profile of its disinfection practice for a period of up to three years.

(2) The system must monitor daily for a period of 12 consecutive calendar months to determine the total logs of inactivation for each day of operation, based on the CT99.9 values in Tables 1.1-1.6, 2.1, and 3.1 of

§141.74(b), as appropriate, through the entire treatment plant. This system must begin this monitoring not later than **April 1, 2000**. As a minimum, the system with a single point of disinfectant application prior to entrance to the distribution system must conduct the monitoring in paragraphs (b)(2)(i) through (iv) of this section. A system with more than one point of disinfectant application must conduct the monitoring in paragraphs (b)(2)(i) through (iv) of this section for each disinfection segment. The system must monitor the parameters necessary to determine the total inactivation ratio, using analytical methods in §141.74(a), as follows:

(i) The temperature of the disinfected water must be measured once per day at each residual disinfectant concentration sampling point during peak hourly flow.

(ii) If the system uses chlorine, the pH of the disinfected water must be measured once per day at each chlorine residual disinfectant concentration sampling point during peak hourly flow.

(iii) The disinfectant contact time(s) ("T") must be determined for each day during peak hourly flow.

(iv) The residual disinfectant concentration(s) ("C") of the water before or at the first customer and prior to each additional point of disinfection must be measured each day during peak hourly flow.

(3) In lieu of the monitoring conducted under the provisions of paragraph (b)(2) of this section to develop the disinfection profile, the system may elect to meet the requirements of paragraph (b)(3)(i) of this section. In addition to the monitoring conducted under the provisions of paragraph (b)(2) of this section to develop the disinfection profile, the system may elect to meet the requirements of paragraph (b)(3)(ii) of this section.

(i) A PWS that has three years of existing operational data may submit those data, a profile generated using those data, and a request that the State approve use of those data in lieu of monitoring under the provisions of paragraph (b)(2) of this section not later than **March 31, 2000**. The State must determine whether these operational data are substantially equivalent to data collected under the provisions of paragraph (b)(2) of this section. These data must also be representative of Giardia lamblia inactivation through the entire treatment plant and not just of certain treatment segments. Until the State approves this request, the system is required to conduct monitoring under the provisions of paragraph (b)(2) of this section.

(ii) In addition to the disinfection profile generated under paragraph (b)(2) of this section, a PWS that has existing operational data may use those data to develop a disinfection profile for additional years. Such systems may use these additional yearly disinfection profiles to develop a benchmark under the provisions of paragraph (c) of this section. The State must determine whether these operational data are substantially equivalent to data collected under the provisions of paragraph (b)(2) of this section. These data must also be representative of inactivation through the entire treatment plant and not just of certain treatment segments.

(4) The system must calculate the total inactivation ratio as follows:

(i) If the system uses only one point of disinfectant application, the system may determine the total inactivation ratio for the disinfection segment based on either of the methods in paragraph (b)(4)(i)(A) or (b)(4)(i)(B) of this section.

(A) Determine one inactivation ratio ($CT_{calc}/CT_{99.9}$) before or at the first customer during peak hourly flow.

(B) Determine successive $CT_{calc}/CT_{99.9}$ values, representing sequential inactivation ratios, between the point of disinfectant application and a point before or at the first customer during peak hourly flow. Under this alternative, the system must calculate the total inactivation ratio by determining ($CT_{calc}/CT_{99.9}$) for each sequence and then adding the ($CT_{calc}/CT_{99.9}$) values together to determine ($\sum(CT_{calc}/CT_{99.9})$).

(ii) If the system uses more than one point of disinfectant application before the first customer, the system must determine the CT value of each disinfection segment immediately prior to the next point of disinfectant application, or for the final segment, before or at the first customer, during peak hourly flow. **The ($CT_{calc}/CT_{99.9}$) value of each segment and ($\sum(CT_{calc}/CT_{99.9})$) must be calculated using the method in paragraph (b)(4)(i) of this section.**

(iii) The system must determine the total logs of inactivation by multiplying the value calculated in paragraph (b)(4)(i) or (ii) of this section by 3.0.

(5) A system that uses either chloramines or ozone for primary disinfection must also calculate the logs of inactivation for viruses using a method approved by the State.

(6) The system must retain disinfection profile data in graphic form, as a spreadsheet, or in some other format acceptable to the State for review as part of sanitary surveys conducted by the State.

(c) Disinfection Benchmarking

(1) Any system required to develop a disinfection profile under the provisions of paragraphs (a) and (b) of this section and that decides to make a significant change to its disinfection practice must consult with the State prior to making such change. Significant changes to disinfection practice are:

- (i) Changes to the point of disinfection;
- (ii) Changes to the disinfectant(s) used in the treatment plant;
- (iii) Changes to the disinfection process; and
- (iv) Any other modification identified by the State.

(2) Any system that is modifying its disinfection practice must calculate its disinfection benchmark using the procedure specified in paragraphs (c)(2)(i) through (ii) of this section.

(i) For each year of profiling data collected and calculated under paragraph (b) of this section, the system must determine the lowest average monthly Giardia lamblia inactivation in each year of profiling data. The system must determine the average Giardia lamblia inactivation for each calendar month for each year of profiling data by dividing the sum of daily Giardia lamblia of inactivation by the number of values calculated for that month.

(ii) The disinfection benchmark is the lowest monthly average value (for systems with one year of profiling data) or average of lowest monthly average values (for systems with more than one year of profiling data) of the monthly logs of Giardia lamblia inactivation in each year of profiling data.

(3) A system that uses either chloramines or ozone for primary disinfection must also calculate the disinfection benchmark for viruses using a method approved by the State.

(4) The system must submit information in paragraphs (c)(4)(i) through (iii) of this section to the State as part of its consultation process.

- (i) A description of the proposed change;
- (ii) The disinfection profile for Giardia lamblia (and, if necessary, viruses) under paragraph (b) of this section and benchmark as required by paragraph (c)(2) of this section; and
- (iii) An analysis of how the proposed change will affect the current levels of disinfection.

§141.173 Filtration.

A public water system subject to the requirements of this subpart that does not meet all of the criteria in this subpart and subpart H for avoiding filtration must provide treatment consisting of both disinfection, as specified in §141.72(b), and filtration treatment which complies with the requirements of paragraph (a) or (b) of this section or §141.73 (b) or (c) by **December 31, 2001**.

(a) Conventional filtration treatment or direct filtration.

(1) For systems using conventional filtration or direct filtration, the turbidity level of representative samples of a system's filtered water must be less than or equal to 0.3 NTU in at least 95 percent of the measurements taken each month, measured as specified in §141.74(a) and (c).

(2) The turbidity level of representative samples of a system's filtered water must at no time exceed 1 NTU, measured as specified in §141.74(a) and (c).

(3) A system that uses lime softening may acidify representative samples prior to analysis using a protocol approved by the State.

(b) Filtration technologies other than conventional filtration treatment, direct filtration, slow sand filtration, or diatomaceous earth filtration. A public water system may use a filtration technology not listed in paragraph (a) of this section or in §141.73(b) or (c) if it demonstrates to the State, using pilot plant studies or other means, that the alternative filtration technology, in combination with disinfection treatment that meets the requirements of §141.72(b), consistently achieves 99.9 percent removal and/or inactivation of Giardia lamblia cysts and 99.99 percent removal and/or inactivation of viruses, and 99 percent removal of Cryptosporidium oocysts, and the State approves the use of the filtration technology. For each approval, the State will set turbidity performance requirements that the system must meet at least 95 percent of the time and that the system may not exceed at any time at a level that consistently achieves 99.9 percent removal and/or inactivation of Giardia lamblia cysts, 99.99 percent removal and/or inactivation of viruses, and 99 percent removal of Cryptosporidium oocysts.

§141.174 Filtration sampling requirements.

(a) **Monitoring requirements for systems using filtration treatment.** In addition to monitoring required by §141.74, a public water system subject to the requirements of this subpart that provides conventional filtration treatment or direct filtration must conduct continuous monitoring of turbidity for each individual filter using an approved method in §141.74(a) and must calibrate turbidimeters using the procedure specified by the manufacturer. Systems must record the results of individual filter monitoring every 15 minutes.

(b) If there is a failure in the continuous turbidity monitoring equipment, the system must conduct grab sampling every four hours in lieu of continuous monitoring, but for no more than five working days following the failure of the equipment.

§141.175 Reporting and recordkeeping requirements.

In addition to the reporting and recordkeeping requirements in §141.75, a public water system subject to the requirements of this subpart that provides conventional filtration treatment or direct filtration must report monthly to the State the information specified in paragraphs (a) and (b) of this section beginning **January 1, 2002**. In addition to the reporting and recordkeeping requirements in §141.75, a public water system subject to the requirements of this subpart that provides filtration approved under §141.173(b) must report monthly to the State the information specified in paragraphs (a) of this section beginning **January 1, 2002**. The reporting in paragraph (a) of this section is in lieu of the reporting specified in §141.75(b)(1).

(a) Turbidity measurements as required by §141.173 must be reported within 10 days after the end of each month the system serves water to the public. Information that must be reported includes:

(1) The total number of filtered water turbidity measurements taken during the month.

(2) The number and percentage of filtered water turbidity measurements taken during the month which are less than or equal to the turbidity limits specified in §141.173(a) or (b).

(3) The date and value of any turbidity measurements taken during the month which exceed 1 NTU for systems using conventional filtration treatment or direct filtration, or which exceed the maximum level set by the State under §141.173(b).

(b) Systems must maintain the results of individual filter monitoring taken under §141.174 of this subpart for at least three years. Systems must report that they have conducted individual filter turbidity monitoring under §141.174 of this subpart within 10 days after the end of each month the system serves water to the public. Systems must report individual filter turbidity measurement results taken under §141.174 of this subpart within 10 days after the end of each month the system serves water to the public only if measurements demonstrate one or more of the conditions in paragraphs (b)(1) through (4) of this section. Systems that use lime softening may apply to the State for alternative exceedance levels for the levels specified in paragraphs (b)(1) through (4) of this section if they can demonstrate that higher turbidity levels in individual filters are due to lime carryover only and not due to degraded filter performance.

(1) For any individual filter that has a measured turbidity level of greater than 1.0 NTU in two consecutive measurements taken 15 minutes apart, the system must report the filter number, the turbidity measurement, and the date(s) on which the exceedance occurred. In addition, the system must either produce a filter profile for the filter within 7 days of the exceedance (if the system is not able to identify an obvious reason for the abnormal filter performance) and report that the profile has been produced or report the obvious reason for the exceedance.

(2) For any individual filter that has a measured turbidity level of greater than 0.5 NTU in two consecutive measurements taken 15 minutes apart at the end of the first four hours of continuous filter operation after the filter has been backwashed or otherwise taken offline, the system must report the filter number, the turbidity, and the date(s) on which the exceedance occurred. In addition, the system must either produce a filter profile for the filter within 7 days of the exceedance (if the system is not able to identify an obvious reason for the abnormal filter performance) and report that the profile has been produced or report the obvious reason for the exceedance.

(3) For any individual filter that has a measured turbidity level of greater than 1.0 NTU in two consecutive measurements taken 15 minutes apart at any time in each of three consecutive months, the system must report the filter number, the turbidity measurement, and the date(s) on which the exceedance occurred. In addition, the system must conduct a self-assessment of the filter within 14 days of the exceedance and report that the self-assessment was conducted. The self assessment must consist of at least the following components: assessment of filter performance; development of a filter profile; identification and prioritization of factors limiting filter performance; assessment of the applicability of corrections; and preparation of a filter self-assessment report.

(4) For any individual filter that has a measured turbidity level of greater than 2.0 NTU in two consecutive measurements taken 15 minutes apart at any time in each of two consecutive months, the system must report the filter number, the turbidity measurement, and the date(s) on which the exceedance occurred. In addition, the system must arrange for the conduct of a comprehensive performance evaluation by the State or a third party approved by the State no later than 30 days following the exceedance and have the evaluation completed and submitted to the State no later than 90 days following the exceedance.

(c) Additional reporting requirements. (1) If at any time the turbidity exceeds 1 NTU in representative samples of filtered water in a system using conventional filtration treatment or direct filtration, the system must inform the State as soon as possible, but no later than the end of the next business day.

(2) If at any time the turbidity in representative samples of filtered water exceeds the maximum level set by the State under §141.173(b) for filtration technologies other than conventional filtration treatment, direct filtration, slow sand filtration, or diatomaceous earth filtration, the system must inform the State as soon as possible, but no later than the end of the next business day.

PART 142-NATIONAL PRIMARY DRINKING WATER REGULATIONS IMPLEMENTATION

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.

22. In Section 142.12, revise paragraph (b)(3)(1), and the last sentence of (d)(2), to read as follows:

§ 142.12 Revision of State programs.

* * * * *

(b) * * *

(3)***

(i) Informing public water systems of the new EPA (and upcoming State) requirements and that EPA will be overseeing implementation of the requirements until the State, if eligible for interim primacy, submits a complete and final primacy revision request to EPA, or in all other cases, until EPA approves the State program revision;

* * * * *

(d)***

(2) Final Request. *** Complete and final State Requests for program revisions shall be submitted within two years of the promulgation of the new or revised EPA regulations, as specified in paragraph (b) of this section.

* * * * *

§ 142.14 Records kept by States.

(a)***

(3) Records of turbidity measurements must be kept for not less than one year. The information retained must be set forth in a form which makes possible comparison with the limits specified in §§141.71, 141.73, 141.173 and 141.175 of this chapter. Until June 29, 1993, for any public water system which is providing filtration treatment and until December 30, 1991, for any public water system not providing filtration treatment and not required by the State to provide filtration treatment, records kept must be set forth in a form which makes possible comparison with the limits contained in §141.13 of this chapter.

* * * * *

(4)(i) Records of disinfectant residual measurements and other parameters necessary to document disinfection effectiveness in accordance with §§141.72 and 141.74 of this chapter and the reporting requirements of §§141.75 and 141.175 of this chapter must be kept for not less than one year.

(ii) Records of decisions made on a system-by-system and case-by-case basis under provisions of part 141, subpart H or subpart P of this chapter, must be made in writing and kept at the State.

* * * * *

(7) Any decisions made pursuant to the provisions of part 141, subpart P of this chapter.

(i) Records of systems consulting with the State concerning a modification to disinfection practice under §141.172(c) of this chapter, including the status of the consultation.

(ii) Records of decisions that a system using alternative filtration technologies, as allowed under §141.173(b) of this chapter, can consistently achieve a 99.9 percent removal and/or inactivation of Giardia lamblia cysts, 99.99 percent removal and/or inactivation of viruses, and 99 percent removal of Cryptosporidium oocysts. The decisions must include State-set enforceable turbidity limits for each system. A copy of the decision must be kept until the decision is reversed or revised. The State must provide a copy of the decision to the system.

(iii) Records of systems required to do filter self-assessment, CPE, or CCP under the requirements of §141.175 of this chapter.

* * * * *

Section 142.15 is amended by adding paragraph (c)(5) to read as follows:

§ 142.15 Reports by States.

* * * * *

(c)***

(5) Sanitary surveys. A list of subpart H systems that have had a sanitary survey completed during the previous year and an annual evaluation of the State's program for conducting sanitary surveys under §142.16 (b)(3) of this chapter.

* * * * *

§ 142.16 Special primacy requirements.

* * * * *

(b)***

(1) Enforceable requirements. (i)***

(ii) States must have the appropriate rules or other authority to assure that PWSs respond in writing to significant deficiencies outlined in sanitary survey reports required under paragraph (b)(3) of this section no later than 45 days after receipt of the report, indicating how and on what schedule the system will address significant deficiencies noted in the survey.

(iii) States must have the appropriate rules or other authority to assure that PWSs take necessary steps to address significant deficiencies identified in sanitary survey reports required under paragraph (b)(3) of this section, if such deficiencies are within the control of the PWS and its governing body.

* * * * *

(3) Sanitary survey. In addition to the general requirements for sanitary surveys contained in §142.10(b)(2), an application must describe how the State will implement a sanitary survey program that meets the requirements in paragraphs (b)(3)(i) through (v) of this section. For the purposes of this paragraph, “sanitary survey” means an onsite review of the water source (identifying sources of contamination using results of source water assessments where available), facilities, equipment, operation, maintenance, and monitoring compliance of a public water system to evaluate the adequacy of the system, its sources and operations and the distribution of safe drinking water.

(i) The State must conduct sanitary surveys for all surface water systems (including groundwater under the influence) that address the eight sanitary survey components listed in paragraphs (b)(3)(i)(A) through (H) of this section no less frequently than every three years for community systems and no less frequently than every five years for noncommunity systems. The State may allow sanitary surveys conducted after December 1995 to serve as the first set of required sanitary surveys if the surveys address the eight sanitary survey components listed in paragraphs (b)(3)(i)(A) through (H) of this section.

(A) Source.

(B) Treatment.

(C) Distribution system.

(D) Finished water storage.

(E) Pumps, pump facilities, and controls.

(F) Monitoring and reporting and data verification.

(G) System management and operation.

(H) Operator compliance with State requirements.

(ii) For community systems determined by the State to have outstanding performance based on prior sanitary surveys, subsequent sanitary surveys may be conducted no less than every five years. In its primacy application, the State must describe how it will decide whether a system has outstanding performance and is thus eligible for sanitary surveys at a reduced frequency.

(iii) Components of a sanitary survey may be completed as part of a staged or phased state review process within the established frequency.

(iv) When conducting sanitary surveys for systems required to comply with the disinfection profiling requirements in §141.172 of this chapter, the State must also review the disinfection profile as part of the sanitary survey.

(v) In its primacy application, the State must describe how it will decide whether a deficiency identified during a sanitary survey is significant for the purposes of paragraph (b)(1)(ii) of this section.

* * * * *

(g) Requirements for States to adopt 40 CFR part 141, subpart P Enhanced Filtration and Disinfection. In addition to the general primacy requirements enumerated elsewhere in this part, including the requirement that State provisions are no less stringent than the federal requirements, an application for approval of a State program revision that adopts 40 CFR part 141, subpart P Enhanced Filtration and Disinfection, must contain the information specified in this paragraph:

(1) Enforceable requirements. States must have the appropriate rules or other authority to require PWSs to conduct a Composite Correction Program (CCP) and to assure that PWSs implement any followup recommendations that result as part of the CCP. The CCP consists of two elements - a Comprehensive Performance Evaluation (CPE) and Comprehensive Technical Assistance (CTA). A CPE is a thorough review and analysis of a plant’s performance-based capabilities and associated administrative, operation and maintenance practices. It is conducted to identify factors that may be adversely impacting a plant’s capability to achieve compliance and emphasizes approaches that can be implemented without significant

capital improvements. A CTA is the performance improvement phase that is implemented if the CPE results indicate improved performance potential. During the CTA phase, the system must identify and systematically address plant-specific factors. The CTA is a combination of utilizing CPE results as a basis for followup, implementing process control priority-setting techniques and maintaining long-term involvement to systematically train staff and administrators.

(2) State practices or procedures.

(i) Section 141.172(a)(3) of this chapter- How the State will approve a more representative annual data set than the data set determined under §141.172 (a)(1) or (2) of this chapter for the purpose of determining applicability of the requirements of §141.172 of this chapter.

(ii) Section 141.172(b)(5) of this chapter-How the State will approve a method to calculate the logs of inactivation for viruses for a system that uses either chloramines or ozone for primary disinfection.

(iii) Section 141.172(c) of this chapter- How the State will consult with PWSs to evaluate modifications to disinfection practice.

(iv) Section 141.173(b) of this chapter-For filtration technologies other than conventional filtration treatment, direct filtration, slow sand filtration, or diatomaceous earth filtration, how the State will determine that a public water system may use a filtration technology if the PWS demonstrates to the State, using pilot plant studies or other means, that the alternative filtration technology, in combination with disinfection treatment that meets the requirements of §141.172(b) of this chapter, consistently achieves 99.9 percent removal and/or inactivation of Giardia lamblia cysts and 99.99 percent removal and/or inactivation of viruses, and 99 percent removal of Cryptosporidium oocysts. For a system that makes this demonstration, how the State will set turbidity performance requirements that the system must meet 95 percent of the time and that the system may not exceed at any time at a level that consistently achieves 99.9 percent removal and/or inactivation of Giardia lamblia cysts, 99.99 percent removal and/or inactivation of viruses, and 99 percent removal of Cryptosporidium oocysts.

Appendix F

Examples of IESWTR Monitoring Forms for States

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

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Examples of Combined Filter Effluent Forms

State of Idaho

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State of Texas

B. Sample Surface Water Monthly Operating Report–Summary Page 8
C. Sample Surface Water Monthly Operating Report–Turbidity Data Page 9

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A. Sample IESWTR Turbidity Report from the State of Idaho



IDAHO DEPARTMENT
OF ENVIRONMENTAL
QUALITY

IESWTR TURBIDITY REPORT

(See reverse for turbidity standards and monitoring frequency)

Turbidimeter	
Calibration method:	Date:
! primary standard	_____
! secondary standard	_____
! another meter	_____

Water System Name:	PWS ID #:	Month: Year:
Source Name:	Submitted by:	County:
PLANT TYPE: ~ conventional ~ direct		

DAY	Total Hours of Operation	Raw water turbidity (NTU)	Record finished water turbidity measurements as required on the						HIGHEST READING	
			1 st	2 nd	3 rd	4 th	5 th	6 th	LEVEL (NTU)	TIME
1										
2										
3										
4										
5										
6										
7										
8										
9										
...										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										
31										

MONTHLY SUMMARY

# days plant operated this month: _____	Number of measurements below performance standard: _____ (see reverse for performance standards)
Total # hours plant operated this month: _____	95% of measurements at or below standard? G YES G NO
Total number of turbidity measurements: _____	All measurements at or below 1 NTU? G YES G NO

B. Sample Surface Water Monthly Operating Report–Summary Report from the State of Texas



SURFACE WATER MONTHLY OPERATING REPORT

FOR PUBLIC WATER SYSTEMS THAT ARE USING SURFACE WATER SOURCES
OR GROUND WATER SOURCES UNDER THE INFLUENCE OF SURFACE WATER
Summary Page

PUBLIC WATER SYSTEM NAME: <u>TNRCC WSC</u>	PLANT NAME OR NUMBER: <u>PDWS Water Treatment Plant</u>	
PWS ID No.: <u>1234567</u>	Operator's Signature: <u>Hardy Worker</u>	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.
Report for the Month of: <u>February 2002</u>	Certificate No. & Grade: <u>123-45-6789, BSW</u>	Date: <u>March 1, 2002</u>

TREATMENT PLANT PERFORMANCE				
Total number of turbidity readings:	133	Number of 4-hour periods when plant was off-line:	34	
Number of readings above 0.10 NTU:	114	Number of 4-hour periods when plant was on-line but turbidity data was not collected:	1	
Number of readings above 0.3 NTU:	5			
Number of readings above 0.5 NTU:	3			
Number of readings above 1.0 NTU:	2			
Maximum allowable turbidity level:	0.3	Number of days with readings above 1.0 NTU:	1 (2)	
Percentage of readings above this limit:	3.8 % (1)	Number of days with readings above 5.0 NTU:	0 (3)	
Statistical Summary	Maximum turbidity reading:	1.17 NTU	Average turbidity value:	0.23 NTU
	Minimum turbidity reading:	0.03 NTU	Standard deviation:	0.149 NTU
Additional report(s) for individual filter monitoring required:		<input type="checkbox"/> NONE <input type="checkbox"/> Filter Profile <input type="checkbox"/> Filter Assessment <input type="checkbox"/> CPE		
Additional report(s) for individual filter monitoring submitted:		<input checked="" type="checkbox"/> NONE <input type="checkbox"/> Filter Profile <input type="checkbox"/> Filter Assessment <input type="checkbox"/> CPE		
		Number of days when plant was on-line but individual filter turbidity data was not collected:	1	
Number of days with a low CT for no more than 4.0 consecutive hours:	1	Average log inactivation for Giardia:	0.00	
Number of days with a low CT for more than 4.0 consecutive hours:	26 (4)	Average log inactivation for viruses:	0.00	
		Number of days when profiling data was not collected:	1	
		Number of days when CT data was not collected:	0	
Minimum disinfectant residual required leaving the plant:	0.5 mg/L	Free Chlorine Total Chlorine		
Number of days with a low residual for no more than 4.0 consecutive hours:	1			
Number of days with a low residual for more than 4.0 consecutive hours:	0 (5)	Number of days when disinfectant residual leaving the plant was not properly monitored:	1	

DISTRIBUTION SYSTEM			
Minimum disinfectant residual required in distribution system:	0.5 mg/L	Free Chlorine Total Chlorine	
Total number of readings this month:	39	Percentage of readings with a low residual this month:	5.1 % (6A)
Average disinfectant residual value:	1.32		
Number of readings with a low residual:	2	Percentage of readings with a low residual last month:	2.6 % (6B)
Number of readings with no detectable residual:	0		

PUBLIC NOTIFICATION			
TREATMENT TECHNIQUE VIOLATIONS	YES/NO	If YES, date when notice was given to:	
		COMMISSION†	CUSTOMERS*
Were more than 5.0% of the turbidity readings above the acceptable level? - see (1) above	No		
Were there any days with turbidity readings above 1.0 NTU? - see (2) above	Yes	February 5, 2002	February 8, 2002
Were there any days with turbidity readings above 5.0 NTU? - see (3) above	No		
Were there any periods when the plant failed to meet the CT requirements for more than 4.0 consecutive hours? - see (4) above	Yes		
Were there any periods when the residuals leaving the plant fell below the acceptable level for more than 4.0 consecutive hours? - see (5) above	No		
Were more than 5.0% of the residuals in the distribution system below the acceptable level for two months in a row? - see (6A) and (6B) above	No		

† Due by the end of the next business day.
* Copies of each Public Notice must accompany this report.

Submit the report by the 10th of the month following the reporting period to:

C. Sample Surface Water Monthly Operating Report–Turbidity Data Page From the State of Texas



SURFACE WATER MONTHLY OPERATING REPORT

FOR PUBLIC WATER SYSTEMS THAT ARE USING SURFACE WATER SOURCES
OR GROUND WATER SOURCES UNDER THE INFLUENCE OF SURFACE WATER (cont.)
Turbidity Data Page

PUBLIC WATER SYSTEM NAME: TNRCC WSC PLANT NAME OR NUMBER: PDWS Water Treatment Plant
PWS ID No.: 1234567 Connections: 11,900
Month: February Year: 2002 Population: 35,700

PERFORMANCE DATA																			
Date	Raw Water Pumpage (MGD)	Treated Water Pumpage (MGD)	RAW WATER ANALYSES		SETTLED WATER TURBIDITY (Optional Data)						FINISHED WATER QUALITY								
			NTU	Alk.	Basin No.						Turbidity						Lowest Residual	Time †	
					1	2	3	4	5	6	NTU1	NTU2	NTU3	NTU4	NTU5	NTU6			
1	1.411	1.322	49	52	2.4	1.9						X	0.19	0.07	0.03	0.31		2.4	
2	1.484	1.444	26	68	2.8	1.8						X	0.33	0.24	0.27	0.15	0.12	3.4	
3	1.598	1.511	12	59	2.1	2.2						X	0.23	0.08	0.12	0.17	0.26	3.1	
4	1.154	1.084	80	92	5.2	4.3						X	0.34	0.46	0.78	1.06	1.17	2.3	
5	0.000	0.889	X	X	X	X						X	X	X	X	X	X	1.1	
6	2.650	1.103	15	61	1.8	1.4						X	X	0.26	0.32	0.21	0.10	2.8	
7	1.302	1.239	73	55	2.3	2.0						X	0.13	0.28	0.38	0.34	0.30	3.0	
8	1.337	1.280	10	47	1.7	1.9						X	0.27	0.24	0.17	0.19	0.04	2.7	
9	1.701	1.687	24	53	1.9	1.6						X	0.24	0.32	0.25	0.18	0.12	0.3	0.75
10	1.408	1.397	16	44	1.2	1.1						X	0.04	0.08	0.07	0.21	0.11	1.9	
11	1.457	1.402	70	62	1.8	1.5						X	0.33	0.06	0.20	0.23	0.34	2.2	
12	1.537	1.522	98	43	3.2	2.3						X	0.29	0.08	0.16	0.14	0.27	3.1	
13	1.092	1.084	16	57	2.2	1.8						X	0.33	0.28	0.10	0.27	0.29	2.0	
14	1.564	1.506	68	48	2.0	1.7						X	0.23	0.26	0.31	0.28	0.03	1.4	
15	1.361	1.278	93	69	2.6	2.1						X	0.30	0.20	0.23	0.05	0.25	1.8	
16	1.879	1.794	10	55	2.1	1.9						X	0.31	0.21	0.17	0.28	0.22	1.5	
17	0.109	0.000	91	58	2.2	X						X	0.20	0.31	0.24	0.34	0.20	X	
18	0.230	0.050	95	64	2.5	X						X	0.17	0.13	0.16	0.32	0.28		
19	1.630	1.557	26	53	3.0	2.5						X	0.22	0.09	0.15	0.16	0.11	2.6	
20	1.293	1.272	21	39	2.3	2.4						X	0.16	0.11	0.19	0.08	0.05	2.6	
21	1.249	1.210	80	61	2.9	2.5						X	0.29	0.26	0.12	0.05	0.31	2.9	
22	1.913	1.894	91	71	2.7	2.0						X	0.14	0.17	0.04	0.05	0.33	1.6	
23	1.926	1.834	95	66	2.4	1.8						X	0.23	0.17	0.26	0.27	0.24	3.0	
24	1.018	0.930	23	54	1.5	1.6						X	0.19	0.16	0.14	0.22	0.32	2.2	
25	1.104	1.016	60	47	2.2	1.4						X	0.20	0.24	0.21	0.18	0.15	2.3	
26	1.934	1.896	25	48	1.7	1.5						X	0.25	0.17	0.27	0.29	0.14	3.2	
27	1.337	1.321	50	37	2.6	2.2						X	0.18	0.30	0.28	0.33	0.27	1.7	
28	1.909	1.893	64	47	2.5	1.9						X	0.21	0.19	0.26	0.15	0.12	2.3	
29																			
30																			
31																			
Total	38.587	36.415																	
Avg	1.378	1.301																	
Max	2.650	1.896																	
Min	0.000	0.000																	

† NOTE: ONLY use the "Time" column to show the length of time that the disinfectant residual entering the distribution system fell below the acceptable level.

SUBMITTED BY: Hardy Worker Certificate No. and Grade: 123-45-6789, BSW Date: March 1, 2002

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Examples of Individual Filter Effluent Forms

State of Wyoming

- A. Sample Monthly Report to the Primacy Agency for Individual Filter (IF) Turbidity Monitoring . 13

State of Texas

- B. Sample Filter Profile Report for Individual Filters 14
- C. Sample Surface Water Monthly Operating Report–Filter Data Page 15
- D. Sample Filter Assessment Report for Individual Filters 16

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A. Sample Monthly Report to the Primacy Agency for Individual Filter (IF) Turbidity Monitoring from the State of Wyoming

Monthly Report to the Primacy Agency for Individual Filter (IF) Turbidity Monitoring

(This report is only required for a PWS that utilizes conventional or direct filtration and serves greater than 10,000 people. These PWSs must record the turbidity from every filter every 15 minutes. Grab sampling every 4 hrs is allowed if the continuous IF turbidimeter fails but for no more than 5 working days. Report within 10 days of the next month.) IF turbidimeters were last calibrated _____

Date: _____ System/Treatment _____

Plant _____

PWSID # _____ Prepared _____

By _____

Year _____ Month _____ -	List all filters* that exceeded turbidity levels of 0.5 NTU after 4 hrs., 1.0 NTU, and 2.0 NTU in 2 consecutive IF readings taken 15 minutes apart.	If 1.0 NTU** was exceeded was a filter profile completed within 7 days?	If 0.5 NTU** was exceeded 4 hrs after a backwash or filter startup was a filter profile completed within 7 days?	If 1.0 NTU*** was exceeded in the same filter 3 months in a row was a self-assessment completed in 14 days?	If 2.0 NTU*** was exceeded in the same filter 2 months in a row was a 3 rd party CPE arranged in 30 days and completed & submitted in 90 days?
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
...					
29					
30					
31					

*For each filter, attach information identifying the every 15 minute turbidity readings that caused the exceedance (s).

**If the IF exceedance was caused by obvious reason(e.g., valve malfunction, etc.) submit a written explanation describing the situation that caused the turbidity exceedance in lieu of the filter profile.

***If a PWS has reported an obvious reason for an exceedance in column 3 & 4 it does not count as one of the consecutive months.

B. Sample Filter Profile Report for Individual Filters from the State of Texas

FILTER PROFILE REPORT FOR INDIVIDUAL FILTERS

FOR PUBLIC WATER SYSTEMS THAT ARE USING SURFACE WATER SOURCES OR GROUND WATER SOURCES UNDER THE INFLUENCE OF SURFACE WATER THAT ARE REQUIRED TO CONDUCT ADDITIONAL INDIVIDUAL FILTER MONITORING

PUBLIC WATER SYSTEM NAME: _____ PLANT NAME OR NUMBER: _____
 PWS ID No.: _____ Month: _____ Year: _____

OBVIOUS REASONS			
<p>FILTER NO.: _____</p> <p>DATE: _____</p> <p>TIME: _____</p> <p>DURATION: _____</p> <p>TURBIDITY: _____</p>	<p>FILTER NO.: _____</p> <p>DATE: _____</p> <p>TIME: _____</p> <p>DURATION: _____</p> <p>TURBIDITY: _____</p>	<p>FILTER NO.: _____</p> <p>DATE: _____</p> <p>TIME: _____</p> <p>DURATION: _____</p> <p>TURBIDITY: _____</p>	
<p>OBVIOUS REASONS (Check all that apply)</p> <p>NONE IDENTIFIED - A Filter Profile must be submitted (See Profile No. _____) (See Profile No. _____) (See Profile No. _____)</p> <p>Filter Problems</p> <ul style="list-style-type: none"> Post-Backwash Turbidity Spike Prolonged Filter Run Time Excessive Filter-Loading Rate Rate-of-Flow Control Valve Failure Media Defects (insufficient depth, mudballs, etc.) Inadequate Surface Wash or Backwash Facilities <p>Turbidimeter Errors</p> <ul style="list-style-type: none"> Incorrect Calibration Air Bubble Debris Backwash Artifact <p>Chemical Feed Equipment Failure</p> <ul style="list-style-type: none"> Coagulant Coagulant Aid Filter Aid <p>Poor Raw Water Quality</p> <p>Other Major Unit Process Failures/Maintenance Activities</p> <p style="margin-left: 20px;"><i>Specify:</i> _____</p>			

OBVIOUS REASONS			
<p>FILTER NO.: _____</p> <p>DATE: _____</p> <p>TIME: _____</p> <p>DURATION: _____</p> <p>TURBIDITY: _____</p>	<p>FILTER NO.: _____</p> <p>DATE: _____</p> <p>TIME: _____</p> <p>DURATION: _____</p> <p>TURBIDITY: _____</p>	<p>FILTER NO.: _____</p> <p>DATE: _____</p> <p>TIME: _____</p> <p>DURATION: _____</p> <p>TURBIDITY: _____</p>	
<p>OBVIOUS REASONS (Check all that apply)</p> <p>NONE IDENTIFIED - A Filter Profile must be submitted (See Profile No. _____) (See Profile No. _____) (See Profile No. _____)</p> <p>Filter Problems</p> <ul style="list-style-type: none"> Post-Backwash Turbidity Spike Prolonged Filter Run Time Excessive Filter-Loading Rate Rate-of-Flow Control Valve Failure Media Defects (insufficient depth, mudballs, etc.) Inadequate Surface Wash or Backwash Facilities <p>Turbidimeter Errors</p> <ul style="list-style-type: none"> Incorrect Calibration Air Bubble Debris Backwash Artifact <p>Chemical Feed Equipment Failure</p> <ul style="list-style-type: none"> Coagulant Coagulant Aid Filter Aid <p>Poor Raw Water Quality</p> <p>Other Major Unit Process Failures/Maintenance Activities</p> <p style="margin-left: 20px;"><i>Specify:</i> _____</p>			

SUBMITTED BY: _____ Certificate No. _____ and Grade: _____ Date: _____

C. Sample Surface Water Monthly Operating Report–Filter Data Page from the State of Texas



SURFACE WATER MONTHLY OPERATING REPORT

FOR PUBLIC WATER SYSTEMS THAT ARE USING SURFACE WATER SOURCES
OR GROUND WATER SOURCES UNDER THE INFLUENCE OF SURFACE WATER (cont.)
Filter Data Page

PUBLIC WATER SYSTEM NAME: TNRCC WSC
PWS ID No.: 1234567

PLANT NAME OR NUMBER: PDWS Water Treatment Plant
Month: February Year: 2002

PERFORMANCE DATA																					
INDIVIDUAL FILTER TURBIDITY																					
Date	Filter No. 1		Filter No. 2		Filter No. 3		Filter No. 4		Filter No. 5		Filter No. 6		Filter No. 7		Filter No. 8		Filter No. 9		Filter No. 10		
	Max	4 Hrs	Max	4 Hrs																	
1	0.37	0.19	0.18	0.11	0.22	0.14	0.31	0.16	0.42	0.22	0.35	0.18									
2	0.38	0.21	0.21	0.13	0.25	0.11	0.33	0.13	0.47	0.23	0.40	0.13									
3	0.41	0.27	0.23	0.15	0.21	0.13	0.29	0.13	0.39	0.26	0.27	0.19									
4	1.32	0.57	0.72	0.34	0.67	0.26	0.87	0.48	1.05	0.52	0.84	0.40									
5	X	X	X	X	X	X	X	X	X	X	X	X									
6	0.27	0.16	0.27	0.14	0.29	0.09	0.42	0.20	0.46	0.19	0.37	0.12									
7	0.35	0.22	0.17	0.09	0.23	0.12	0.37	0.16	0.49	0.23	0.33	0.18									
8	0.33	0.17	0.22	0.12	0.17	0.08	0.32	0.13	0.38	0.17	0.26	0.17									
9	0.28	0.15	0.16	0.08	0.24	0.10	0.41	0.14	0.34	0.18	0.29	0.10									
10	0.21	0.19	0.14	0.07	0.11	0.05	0.26	0.15	0.41	0.21	0.32	0.23									
11	0.24	0.17	0.18	0.11	0.30	0.16	0.34	0.14	0.28	0.16	0.25	0.16									
12	0.36	0.20	0.19	0.10			0.42	0.21	0.48	0.24	0.38	0.20									
13	0.19	0.12	0.10	0.06	0.26	0.11	0.33	0.17	0.43	0.25	0.22	0.15									
14	0.29	0.18	0.23	0.09	0.18	0.10	0.35	0.16	0.40	0.20	0.29	0.13									
15	0.42	0.21	0.22	0.13	0.16	0.06	0.28	0.12	0.37	0.15	0.31	0.19									
16	0.26	0.17	0.15	0.08	0.27	0.15	0.32	0.19	0.39	0.15	0.36	0.21									
17	0.34	X	0.25	0.12	X	X	X	X	X	X	X	X									
18	0.18	0.16	0.24	0.14	X	X	X	X	X	X	X	X									
19	0.26	0.18	0.14	0.08	0.23	0.14	0.32	0.17	0.46	0.26	0.32	0.16									
20	0.25	0.15	0.20	0.11	0.27	0.17	0.38	0.18	0.39	0.24	0.26	0.13									
21	0.41	0.24	0.23	0.10	0.18	0.12	0.33	0.15	0.32	0.19	0.38	0.20									
22	0.39	0.22	0.19	0.13	0.20	0.13	0.29	0.20	0.42	0.23	0.23	0.17									
23	0.32	0.19	0.18	0.09	0.26	0.18	0.41	0.23	0.37	0.18	0.33	0.12									
24	0.27	0.17	0.22	0.15	0.28	0.11	0.39	0.19	0.40	0.25	0.37	0.18									
25	0.22	0.15	0.21	0.12	0.14	0.08	0.31	0.20	0.35	0.20	0.35	0.20									
26	0.26	0.21	0.16	0.07	0.17	0.08	0.29	0.16	0.45	0.27	0.30	0.15									
27	0.31	0.25	0.25	0.11	0.21	0.12	0.36	0.14	0.41	0.28	0.27	0.11									
28	0.29	0.20	0.16	0.09	0.19	0.10	0.30	0.18	0.38	0.22	0.29	0.13									
29																					
30																					
31																					

SUMMARY & COMPLIANCE ACTIONS	Criteria	Filter No.										Plant										
		1	2	3	4	5	6	7	8	9	10											
Number of days with event(s) above 0.5 NTU at 4.0 hrs this month		1	0	0	0	0	0															
Number of days with event(s) above 1.0 NTU this month		1	0	0	0	1	0															
Number of days with event(s) above 1.0 NTU last month		0	0	0	0	0	0															
Number of days with event(s) above 1.0 NTU two months ago		NA	NA	NA	NA	NA	NA															
Total number of days with event(s) above 1.0 NTU in three months		1	0	0	0	1	0															
Number of days with event(s) above 2.0 NTU this month																						0
Number of days with event(s) above 2.0 NTU last month																						0
Does the plant have an approved corrective action schedule?		N	N	N	N	N	N															N
Is the plant required to submit a Filter Profile Report?		Y	N	N	N	Y	N															
Is the plant required to submit a Filter Assessment Report?		N	N	N	N	N	N															
Is the plant required to submit a Request for Compliance CPE?																						N

SUBMITTED BY: Hardy Worker Certificate No. and Grade: 123-45-6789, BSW Date: March 1, 2002

D. Sample Filter Assessment Report for Individual Filters from the State of Texas (Page 1)

FILTER ASSESSMENT REPORT FOR INDIVIDUAL FILTERS

FOR PUBLIC WATER SYSTEMS THAT ARE USING SURFACE WATER SOURCES OR GROUND WATER SOURCES UNDER THE INFLUENCE OF SURFACE WATER THAT ARE REQUIRED TO CONDUCT AN INDIVIDUAL FILTER ASSESSMENT

PUBLIC WATER SYSTEM NAME: _____ PLANT NAME OR NUMBER: _____
 PWS ID No.: _____ FILTER NUMBER: _____

DESIGN SPECIFICATIONS						
	Diameter	Length	Width	Surface Area	Freeboard	Available Head
MEDIA BED						
MEDIA TYPE						
MEDIA SPECS	Min. Size	Max. Size	UC	Density	Depth	
Layer 1 Material						
Layer 2 Material						
Layer 3 Material						
Layer 4 Material						
TOTAL DEPTH						
L/D RATIO						
UNDERDRAIN TYPE						
	No. of Grades	Min. Size	Max. Size	Total Depth		
SUPPORT GRAVEL						
TROUGHS						
No.						
Separation						
	SUPPL. BACKWASH					
	FILTER-TO-WASTE					
OPERATING MODE						
FLOW DISTRIBUTION	Regulatory	Design	Typical	Backwash	Maximum	
FILTER FLOW RATE						
FLT. LOADING RATE						
BACKWASH RATE						
BW LOADING RATE						
	Source	Controller	Meter	Turbidimeter	LOHG	
FILTER EFFLUENT						
BACKWASH WATER						
ADDITIONAL REMARKS:						
OPERATING PROCEDURES						
CALIBRATION	Flow Meter	Backwash Meter	NTU (Primary)	NTU (Secondary)	ROFC	
Method						
Frequency						
Date of Last						
BACKWASH	Turbidity	LOH	Run Time	Run Volume		
Criteria						
Monitoring Interval						
SOPs						
Start-up						
Shutdown						
Backwash						
Filter Inspection						
ADDITIONAL REMARKS:						

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: _____

**D. Sample Filter Assessment Report for Individual Filters from the State of Texas
(Page 2)**

FILTER ASSESSMENT REPORT FOR INDIVIDUAL FILTERS

FOR PUBLIC WATER SYSTEMS THAT ARE USING SURFACE WATER SOURCES OR GROUND WATER SOURCES UNDER THE INFLUENCE OF SURFACE WATER THAT ARE REQUIRED TO CONDUCT AN INDIVIDUAL FILTER ASSESSMENT

SYSTEM NAME: _____ PLANT NAME OR NUMBER: _____
 PWS ID No.: _____ FILTER NUMBER: _____

CURRENT CONDITIONS					
DATE	TIME	TURBIDITY	LOH	RUN TIME	RUN VOLUME
PHYSICAL CONDITION		ADDITIONAL REMARKS:			
Walls					
Troughs					
Suppl. Backwash					
Flow Meter					
ROFC					
Flow Control Valve					
Turbidimeter					
LOHG					

MEDIA SURFACE CONDITIONS					
	Before BW	After BW		Before BW	After BW
MOUNDS			RETRACTION		
No.			No.		
Length			Length		
Width			Width		
Height			Depth		
DEPRESSIONS			CRACKS		
No.			No.		
Length			Length		
Width			Width		
Depth			Depth		
ACCUMULATED FLOC			MUDBALLS		
Thickness			Quantity		
Distribution			Size		
			Distribution		
ADDITIONAL REMARKS:					

BACKWASH CONDITIONS		ADDITIONAL REMARKS:
FLOW RATE		
RISE RATE		
FILTRATION RATE		
DURATION		
VOLUME		
TROUGHS		
Levelness		
Flooding		
SUPPL. BACKWASH		
Duration		
Effectiveness		
JETTING		
No. of Sites		
Severity		
FLOC MOVEMENT		
TURBIDITY		
EXPANSION		
YIELD		

Submitted by: _____ Date: _____

**D. Sample Filter Assessment Report for Individual Filters from the State of Texas
(Page 3)**

FILTER ASSESSMENT REPORT FOR INDIVIDUAL FILTERS

FOR PUBLIC WATER SYSTEMS THAT ARE USING SURFACE WATER SOURCES OR GROUND WATER SOURCES UNDER THE INFLUENCE OF SURFACE WATER THAT ARE REQUIRED TO CONDUCT AN INDIVIDUAL FILTER ASSESSMENT

SYSTEM NAME: _____ PLANT NAME OR NUMBER: _____
 PWS ID No.: _____ FILTER NUMBER: _____

FILTER PROBE		
NO. OF SITES		ADDITIONAL REMARKS:
MEDIA		
Max. Depth		
Min. Depth		
Typ. Depth		
SUPPORT MATERIAL		
Max. Elevation		
Min. Elevation		
Typ. Elevation		

FILTER EXCAVATION						
	REFERENCE	SITE 2	SITE 3	SITE 4	SITE 5	SITE 6
CONDITION	Normal					
LAYER 1						
INTERFACE 1						
LAYER 2						
INTERFACE 2						
LAYER 3						
INTERFACE 3						
LAYER 4						
INTERFACE 4						
MUDBALLS						
Max. Size						
Min. Size						
Max. Depth						
	SITE 7	SITE 8	SITE 9	SITE 10	SITE 11	SITE 12
CONDITION						
LAYER 1						
INTERFACE 1						
LAYER 2						
INTERFACE 2						
LAYER 3						
INTERFACE 3						
LAYER 4						
INTERFACE 4						
MUDBALLS						
Max. Size						
Min. Size						
Max. Depth						

MEDIA CONDITION		ADDITIONAL REMARKS:
Sharpness		
Encrustation		
Uniformity		

ADDITIONAL STUDIES		
PERCENT MUDBALLS		ADDITIONAL REMARKS:
Media Volume		
Mudball Volume		
% Mudballs		

CONCLUSIONS	
CONCLUSIONS:	CORRECTIVE ACTION PLAN ATTACHED?

Submitted by: _____

Date: _____

**D. Sample Filter Assessment Report for Individual Filters from the State of Texas
(Page 4)**

FILTER ASSESSMENT REPORT FOR INDIVIDUAL FILTERS
FOR PUBLIC WATER SYSTEMS THAT ARE USING SURFACE WATER SOURCES OR GROUND WATER SOURCES UNDER
THE INFLUENCE OF SURFACE WATER THAT ARE REQUIRED TO CONDUCT AN INDIVIDUAL FILTER ASSESSMENT

SYSTEM NAME: _____ PLANT NAME OR NUMBER: _____
PWS ID No.: _____ FILTER NUMBER: _____

FILTER SCHEMATIC

PREPARE A SIMPLE FILTER SCHEMATIC SHOWING THE LOCATION OF BACKWASH WATER TROUGHS, OBSERVED ANOMOLIES, AND EXCAVATION SITES.

Submitted by: _____ Date: _____

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