

*Implementation Guidance for the Interim
Enhanced Surface Water Treatment Rule*

*Idaho Division of Environmental Quality
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Preface

The *Interim Enhanced Surface Water Treatment Rule (IESWTR)* was promulgated by EPA on December 16, 1998. The state of Idaho's adoption of this rule became effective at the close of the 2000 Idaho Legislature. This guidance outlines the approach that DEQ will take in implementing the *IESWTR*.

EPA has prepared several Guidances that will be used extensively in implementing the rule in Idaho. These are listed below. If these documents are mentioned in this Guidance, they will be identified by the abbreviated name that is in brackets following each citation.

Guidance Manual for Conducting Sanitary Surveys of Public Water Systems; Surface Water and Ground Water Under the Direct Influence (GWUDI) of Surface Water. EPA 815-R-99-016, April 1999. [Sanitary Survey Guidance Manual]

Guidance Manual for Compliance with the Interim Enhanced Surface Water Treatment Rule: Turbidity Provisions. EPA 815-R-99-010, April 1999. [Turbidity Guidance Manual]

Disinfection Profiling and Benchmarking Guidance Manual. EPA 815-R-99-013, August 1999. [Profiling and Benchmarking Manual]

Optimizing Water Treatment Plant Performance Using the Composite Correction Program. EPA 625/6-91/027 Revised August 1998. [CCP Manual]

Implementation Guidance Manual for the Interim Enhanced Surface Water Treatment Rule. EPA 816-R-01-011, June 2001. [IESWTR Implementation Manual]

Guidance Manual for Compliance with the Filtration and Disinfection Requirements for Public Water Systems Using Surface Water Sources. US EPA, 1991 [SWTR Guidance Manual]

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Introduction

This manual is intended to serve as a quick reference to the requirements of the *Interim Enhanced Surface Water Treatment Rule (IESWTR)*. **Only those aspects of the rule that have application in Idaho are emphasized.** With the exception of the state policies in Section 4, reference is made to EPA guidance for substantial details. Full citations to the EPA manuals are given in the preface, along with shortened names by which these publications will be identified throughout this guidance. DEQ drinking water personnel, public water system officials, and other interested parties can use this guidance as a starting point when examining the requirements of this federal rule.

Section 1 is an overview of the *IESWTR* and a timetable for compliance. Each requirement listed in the timetable is cross-referenced to the remaining sections of this document and to the applicable EPA Guidance Manuals.

Section 2 summarizes the disinfection profiling and benchmarking requirements.

Section 3 outlines the turbidity provisions of the rule.

Section 4 contains policies and procedures that the state must follow in order to meet the special primacy requirements set forth in connection with the *IESWTR*.

Appendix A presents the selected excerpts from the language that is being added to the *Idaho Rules for Public Water Systems* in order to legally adopt the federal rule.

Appendix B provides a list of potentially significant deficiencies that may be observed during a sanitary survey.

Appendix C is a sample turbidity monitoring form.

Acronyms and Definitions

CCP: Composite Correction Program. A structured approach to analyzing the performance of filtration and disinfection facilities. This activity is commonly carried out by a water system in cooperation with a third party consultant. The *IESWTR* requires systems which use surface water or GWUDI sources to undergo a CCP evaluation under specific circumstances, as described in this Guidance.

DEQ: Division of Environmental Quality, Idaho's primacy agency for administration of the Safe Drinking Water Act. When the term, "the State" is used in this Guidance, it refers to this agency.

DDBP Rule: The *Disinfectants and Disinfection Byproducts Rule*, promulgated by EPA on December 16, 1998.

DBP: Disinfection Byproducts. Compounds formed by the reaction of disinfectants with naturally occurring carbon compounds in drinking water.

EPA: The United States Environmental Protection Agency. Has oversight responsibility with respect to the Safe Drinking Water Act. Prepares Guidances and other documents to aid in achieving consistent implementation nationally.

IESWTR: The *Interim Enhanced Surface Water Treatment Rule*, promulgated by EPA on December 16, 1998.

M/DBP Rules: Refers to the *IESWTR and DDBP Rule* collectively.

SWTR: The *Surface Water Treatment Rule*, promulgated by EPA in 1989.

Section 1-- Rule Overview and Implementation Timetable

1.A. Water Systems Affected by this Rule

All public water systems using surface water or ground water under the direct influence of surface water (GWUDI), which serve at least 10,000 customers, are required to comply with this rule.

1.B. General Requirements

The *IESWTR* contains the following provisions:

- * Establishes an MCLG of zero for *Cryptosporidium*. Water systems are required to provide treatment that achieves 2 logs (99%) removal of *Cryptosporidium*. This requirement is assumed to be met when the system is in compliance with turbidity standards (below).
- * For systems using conventional or direct filtration, turbidity of combined filter effluent, measured every four hours and reported in accordance with the *Surface Water Treatment Rule (SWTR)*, must be .3 NTU in at least 95 percent of the measurements taken each month. It must not exceed 1 NTU at any time.
- * Turbidity standards for systems using slow sand or diatomaceous earth filtration remain the same as the SWTR. The state must approve alternative filtration technologies and set turbidity performance requirements.
- * Conventional or direct filtration systems must continuously monitor the turbidity performance of individual filters. Results must be recorded every fifteen minutes and turbidimeters must be calibrated using procedures specified by the manufacturer. This provision is *not* part of the treatment technique requirements, but is intended to identify weaknesses in filter performance so that corrective action can be taken. An escalating series of follow-up actions is required when individual filters fail to meet performance standards. These are covered in more detail in the turbidity section of this guidance.
- * Turbidity records must be maintained by the water system for at least three years. Combined effluent turbidity measurements are to be reported to the state within 10 days after the end of each month. An exception report for individual filter turbidity performance is required when certain levels are exceeded.
- * Systems must determine the annual average concentration of total trihalomethanes (TTHM's) and a group of five haloacetic acids (HAA5). If these levels are 0.064 mg/l or 0.048 mg/l respectively, the system must profile its inactivation of *Giardia lamblia* over a twelve-month period. If a system decides to make a

significant change in its disinfection practices, it must calculate a benchmark from its disinfection profile and consult with the state. These requirements are covered in more detail in Section 3 of this Guidance.

- * The definition of ground water under the direct influence of surface water has been modified for systems serving 10,000 or more customers to include occurrence of *Cryptosporidium*. Idaho has included this modified definition in its *Rules for Public Water Systems*.
- * The *IESWTR* retains the same public notification requirements as the *SWTR*.
- * The state is required to conduct sanitary surveys every three years for community water systems and every five years for non-community systems which use surface water or ground water under the direct influence of surface water as a source. These surveys must consider eight separate elements, as outlined in State-EPA Joint Guidance. Details of the sanitary survey requirements are provided in Section 4 of this Guidance.
- * States are required to keep certain records and must report violations to EPA in the same manner as required for other national drinking water regulations. Section 4 of this Guidance contains policies covering these requirements.

The table on the following page lists key dates for compliance with the provisions of the *IESWTR*. In order to streamline this document, only those aspects of the rule that have applicability in Idaho are listed in the table. At the time this Guidance is being written, Idaho has only two public water systems that must comply with this rule.

1.C. Timetable for the *IESWTR* Requirements

Date	Rule Requirement	Reference
February 16, 1999	Construction of uncovered finished water reservoirs is prohibited.	CFR 141.170(c) IDAPA 58.01.08.301.01
March 1999	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.	CFR 141.172 IDAPA 58.01.08.301.03 DEQ <i>IESWTR</i> Guidance page 12 EPA Profiling and Benchmarking Guidance
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.	CFR 141.172 IDAPA 58.01.08.301.03 Same as previous requirement.
March 31, 2000	Systems that began monitoring in March 1999 for TTHM and HAA5 to determine if they must develop a disinfection profile must submit this data to the state.	CFR 141.172 Same as previous requirement.
April 1, 2000	Systems with annual average TTHM 0.064 mg/l or HAA5 0.048 mg/l must begin developing a disinfection profile.	CFR 141.172 Same as previous requirement.
April 1, 2001	Disinfection profile to be completed.	Same as previous requirement.
December 31, 2001	Systems that were required to develop a disinfection profile that wish to make a significant change to their disinfection practice after this date must first calculate a disinfection benchmark and consult with the state.	CFR 141.170(a) DEQ <i>IESWTR</i> Guidance pp. 12-13 EPA Profiling and Benchmarking Guidance
December, 2001	States must begin first round of sanitary surveys for all surface water and GWUDI systems.	CFR 142.16 IDAPA 58.01.08.302 DEQ <i>IESWTR</i> Guidance pp. 18-19 EPA Sanitary Survey Guidance Manual
January 1, 2002	Systems must comply with the reporting and recordkeeping requirements of CFR 141.175, including turbidity exceptions reporting. Systems must, <u>when appropriate</u> : *Produce filter profiles or identify obvious reasons for poor performance. *Report profile has been produced or identify obvious reason for poor performance. *Conduct filter self-assessments *Have 3rd party CPE's performed.	DEQ <i>IESWTR</i> Guidance Section 3 (Pages 14-16) EPA Turbidity Guidance Manual
January 1, 2002	Requirements of Subpart P (<i>IESWTR</i>) generally apply to surface water and GWUDI systems that serve at least 10,000 people (called Subpart H systems).	CFR 141.170(a)
December, 2004	State must have first round of sanitary surveys completed for Subpart H community water systems.	CFR 142.16 IDAPA 58.01.08.302
December, 2006	State must have first round of sanitary surveys completed for Subpart H community water systems with "outstanding performance" and Subpart H non-community systems.	CFR 142.16 IDAPA 58.01.08.302

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Section 2-- Disinfection Profiling and Benchmarking

2.A. Introduction

The *Disinfectants and Disinfection By-Products Rule (DDBP)*, which was promulgated at the same time as the *IESWTR*, places limits on the concentration of TTHM's and HAA5's in finished drinking water. Some water systems may find it necessary or desirable to change their disinfection practices in order to reduce concentrations of these compounds. The profiling and benchmarking requirements of the *IESWTR* are designed to determine if large surface water systems are at risk of exceeding the MCL's for disinfection by-products and, if so, to require such systems to develop a profile of existing disinfection performance to be used as a reference when considering future changes in disinfection practices. Systems will not be allowed to reduce microbial protection below the benchmark level when enacting changes designed to comply with the *DDBP Rule* requirements.

2.B. Summary of Requirements

Profiling and benchmarking is a three-step process. A brief overview follows. For additional detail, refer to EPA's *Profiling and Benchmarking Manual*.

Step 1- determining if a system must develop a profile. Large systems that participated in monitoring required under the *Information Collection Rule* already had four consecutive quarters of TTHM and HAA5 data at the time the *IESWTR* was promulgated. Those systems which did not have this data were required to begin quarterly monitoring for these compounds in March, 1999. An EPA fact sheet outlining these monitoring requirements was sent to Idaho's large surface water systems in January, 1999. If the annual average concentration of TTHM's is 0.064 mg/l or the annual average concentration of HAA5's is 0.048 mg/l, the system must develop a disinfection profile.

Step 2- developing the profile. Systems that determine they must profile based on sampling described in Step 1 must monitor daily for a year to determine total logs of *Giardia lamblia* inactivation for each day of operation. This monitoring is to begin by April 1, 2000 (see table of *IESWTR* compliance dates). The profile must characterize inactivation throughout the treatment plant. Monitoring is to be done during peak hourly flow. Temperature is measured daily at each residual disinfectant sampling point. If the system uses chlorine, the pH value of the disinfected water must be measured once a day at each disinfectant residual sampling point. Disinfectant contact time must be determined each day for each residual sampling point. The disinfectant residual concentration of water before or at the first customer and before each additional point of disinfection must be measured each day. Inactivation is then calculated by the Concentration X Time (CT) method used for the *SWTR*. Surface water systems are already familiar with this methodology. The disinfection profile must be maintained in a graphic or other acceptable format so that it can be reviewed by the state during a regularly scheduled sanitary survey.

Step 3- calculating a disinfection benchmark and consulting with the state. If a water system decides in the future to make a significant change in its disinfection practices, it must calculate a benchmark and consult with the state. The system determines the average *G. lamblia* inactivation for each calendar month that data were profiled (one year minimum). This value is calculated by dividing the sum of daily log inactivation by the number of values calculated for that month. The disinfection benchmark is the lowest average monthly inactivation for systems with one year of data. The *EPA Profiling and Benchmarking Manual* provides additional detail and examples of calculations, including situations where multiple years of profiling data are available. When consulting with the state, the system must submit its benchmark information, describe proposed changes to disinfection practices, and provide an analysis of how the changes in disinfection practice will affect current levels of disinfection effectiveness.

2.C. Reporting and Recordkeeping by the Water System

The water system must report the results of TTHM and HAA5 monitoring to the state. Data collected under the *Information Collection Rule* is due by December, 1999. Those systems that began monitoring in March of 1999 must submit their data by March of 2000. See the timetable on page 9 of this guidance.

If a system is required on the basis of this monitoring to prepare a disinfection profile, it must retain the profile and make it available for examination by the state during a regularly scheduled sanitary survey. The profile does not have to be submitted to the state. It is a reference tool that will be used by the system and the state in evaluating possible impacts of future changes in disinfection practices.

Section 3-- Turbidity Requirements

3.A. Combined Effluent Turbidity

The *IESWTR* tightens the turbidity performance standards of the *Surface Water Treatment Rule*. EPA's *Turbidity Guidance Manual* provides detailed information on these requirements. ***It is assumed that the IESWTR requirement to remove 2 logs (99%) of Cryptosporidium is being achieved when these turbidity standards are met.*** The following table compares turbidity performance standards under the two rules for systems using conventional or direct filtration. Both of the large surface water systems in Idaho that are affected by the *IESWTR* use this treatment technology. For this reason, turbidity requirements for other treatment methods are not covered in this Guidance.

Requirement	SWTR	IESWTR
Combined effluent turbidity measured every four hours must not exceed in 95% of monthly measurements...	.5 NTU	.3 NTU
Combined effluent turbidity must never exceed...	5 NTU	1 NTU

3.B. Individual Filter Turbidity Monitoring

The *IESWTR* requires systems using conventional or direct filtration to monitor individual filters continuously for turbidity of effluent water. Turbidity meters must be regularly calibrated in accordance with the equipment manufacturer's instructions. Turbidity must be recorded every fifteen minutes during periods when the plant is producing water. If automatic turbidity monitoring equipment fails, the system must take grab samples every four hours until repairs are made. Grab sampling may not continue for more than five working days from the time of equipment breakdown. **The individual filter turbidity monitoring requirement is not considered part of the treatment technique requirements of this rule.** It is intended to provide a systematic method for monitoring individual filter performance. An escalating series of corrective responses are required when a filter is performing poorly (see below).

EPA's *Turbidity Guidance Manual* provides a thorough technical background on the technology and methodology of turbidity measurement. It also includes discussion of the usefulness of turbidity measurements as an indicator of filtration efficiency. Water systems and drinking water staff should refer to this manual for details on monitoring requirements and for descriptions of the responses required when individual filter turbidity excursions occur.

There are four conditions which trigger follow-up action:

- 1) *Individual filter turbidity is > 1.0 in two consecutive measurements taken 15 minutes apart.*

Action Required: System must record the filter number, turbidity measurements, and dates. A filter profile must be produced within seven days if there is no obvious reason for the excess turbidity. The system must report to the state that a profile has been produced (or report the obvious reason for the excess turbidity) within 10 days after the end of each month the system delivers water to the public.

2) Individual filter turbidity is > 0.5 NTU in two consecutive measurements taken 15 minutes apart at the end of 4 hours of operation after the filter has been backwashed or otherwise taken off line.

Action Required: System must record the filter number, turbidity measurements, and date(s). A filter profile must be produced within seven days if there is no obvious reason for the excess turbidity. The system must report to the state that a profile has been produced (or report the obvious reason for the excess turbidity) within 10 days after the end of each month that the system delivers water to the public.

3) Individual filter turbidity is >1.0 NTU in two consecutive measurements taken 15 minutes apart in each of three consecutive months.

Action Required: Record the filter number, turbidity measurements, and date(s). Conduct an assessment of the filter's performance within 14 days, and develop a filter profile. Identify and prioritize the factors limiting filter performance and prepare a filter assessment report.

4) Turbidity is > 2.0 NTU in two consecutive measurements taken 15 minutes apart in two consecutive months.

Action Required: Record the filter number, turbidity measurements, and date(s). Arrange for a comprehensive performance evaluation (CPE) no more than thirty days after the excess turbidity was measured. Complete and submit the CPE to the state no more than 90 days after the excess turbidity was measured. .

3.C. Reporting and Recordkeeping by the Water System

The water system must report the results of combined effluent turbidity monitoring to the state within ten days of the end of each month that it serves water to the public, just as it currently does under the requirements of the SWTR. A form for reporting these results is included in Appendix C. Given the fact that large systems will almost certainly be recording turbidity continuously, use of this form is not mandatory. However, the data that would ordinarily be presented on the form must be reported in a format that allows the water system and the state to easily compare turbidity results with the limits specified in the rule.

Records of individual filter turbidity monitoring must be retained by the system for at least three years. The system must prepare an exception report and submit it to the state when individual filter turbidity exceeds certain levels as described in preceding section.

Section 4-- State Recordkeeping and Special Primacy Requirements

4.A. Introduction

This section establishes policies and procedures that are specified under the special primacy requirements of the *IESWTR*.

4.B. Sanitary Surveys

General—Section 302 of the *Idaho Rules for Public Water Systems* establishes the requirement that DEQ conduct a sanitary survey of all community surface water and GWUDI systems every three years. Non-community systems must be surveyed every five years. See Appendix B of this Guidance for selected excerpts from the *Idaho Rules* pertaining to sanitary surveys. A sanitary survey is defined (IDAPA 58.01.08.003) as being comprised of eight elements:

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

These elements are described in detail in the *EPA Sanitary Survey Manual*. If a water system has developed a disinfection profile, DEQ will examine the profile as part of the sanitary survey for that system. The elements of the survey may be examined in stages, so long as the entire survey is completed within the required time frame for each type of system.

System response required— Section 302 of the *Idaho Rules* also establishes the requirement that a water system respond in writing within 45 days of receiving a sanitary survey report describing how and on what schedule the system will respond to significant deficiencies noted in the report. Significant deficiencies are defined (IDAPA 58.01.08.003) as “any defect in a system’s design, operation, maintenance, or administration, as well as any failure or malfunction of any system component, that the State determines to cause, or have potential to cause, risk to health or safety, or that could affect the reliable delivery of safe drinking water.”

Significant deficiencies must be corrected—Finally, Section 302 establishes that a failure by the system to correct deficiencies that are under the control of the public water system and its governing body will constitute a violation of the *Idaho Rules*. As such, administrative penalties and other remedies may be imposed by the state if the system does not comply with these requirements. It is DEQ’s responsibility to track and follow up on efforts by the system to meet the schedule for correcting deficiencies.

Discussion of significant deficiencies—The general definition of a significant deficiency given in the *Idaho Rules for Public Drinking Water Systems* was quoted on the preceding page.

EPA’s *Sanitary Survey Manual* (Pages 4-5 to 4-7) describes some common deficiencies that may be significant for any given water system. These deficiencies and others from additional sources are compiled in Appendix B. This reference list may be helpful to an inspector when weighing the importance of a particular deficiency, but it is not intended to be prescriptive in nature. Questions that might be asked when deciding whether or not a deficiency is significant are:

- * *Does the deficiency meet the state definition given above?*
- * *Does the deficiency cause the potential for contaminants to be introduced to the drinking water?*
- * *If left uncorrected, will the deficiency cause the potential for the introduction of contaminants at some point in the future?*
- * *Does the deficiency affect treatment in an unacceptable manner?*
- * *Does the deficiency pose risks to the safety of the public or operators?*

It is understood that a specific deficiency may be more serious for one water system than it is for another, given the complexity of the system, differences in treatment methods and control systems, and other site-specific factors. Professional judgement by the person conducting the sanitary survey will prevail in such matters. DEQ will err on the side of caution with respect to public health and safety.

Outstanding performance—The *IESWTR* allows the state to reduce the frequency of sanitary surveys for community water systems from three years to five, if the water system has demonstrated “outstanding performance.” The following criteria will be used to make this decision:

1. No significant deficiencies noted in the current survey. A current survey is any sanitary survey conducted after 1995 that addressed all eight of the elements described above.
2. No MCL violations since the last survey, unless it can be shown that any MCL violations that do exist are unrelated to deficiencies in system construction, treatment practices, operation, or management. An example of the latter situation would be a chemical MCL exceedance due to previously undetected contamination in a water source.
3. No monitoring or reporting violations during the past five years.
4. No waterborne disease outbreaks attributable to the system during the past five years.
5. Evidence of expert operation, such as;
 - a. Active cross-connection control program
 - b. O & M manuals current and accessible

- c. Operator up to date on training and other certification requirements
- d. System meeting exceptional turbidity performance standards regularly

Standards for service providers—Should it become necessary or desirable to use third party service providers to conduct sanitary surveys, these providers will be expected to complete surveys in accordance with this Guidance and the *EPA Sanitary Survey Manual*. DEQ has recently adopted a policy (DW-00-02, effective 8/10/00) which outlines the requirements for third parties seeking to become an “agent approved by the state” for the purpose of performing sanitary surveys.

4.C. Composite Correction Programs (CCP)

General—Section 003 of the *Idaho Rules for Public Water Systems* provides a definition of the composite correction program and its constituent elements. Section 303 states that DEQ may require a system using surface water or GWUDI to arrange for a CCP to be performed for the purpose of finding and correcting deficiencies in water treatment or distribution. Failure to implement performance improvement factors identified in the course of the CCP is a violation of the *Idaho Rules*.

EPA Guidance—The *CCP Manual* (see page 1 of this Guidance) describes the process to be followed in carrying out a CCP evaluation.

Service Providers—A water system required to conduct a CCP evaluation may obtain assistance from various service providers. These may consist of engineering firms or other qualified water industry professionals.

CCP Findings—A copy of the CCP findings report must be provided to DEQ for use in tracking system progress in implementing performance improvement opportunities identified during the CCP evaluation.

4.D. Evaluating a “More Representative Data Set” for Purposes of Determining the Need to Prepare a Disinfection Profile

A water system is allowed by 40 CFR 141.172(a)(3) to request that the state consider a “more representative data set” when deciding whether or not the system must prepare a disinfection profile. DEQ will evaluate any such requests on a case by case basis. In general, the system must demonstrate that treatment or other practices have been modified in such a way that original monitoring results are no longer reflective of the system’s potential to create disinfection byproducts.

4.E. Calculation of Virus Inactivation for Systems using Chloramines or Ozone

These disinfectants are not in use by systems in Idaho that are subject to the *IESWTR*. If treatment methods change in the future, DEQ will use the following approach in determining virus inactivation:

For chloramines— Systems that use chlorine prior to adding ammonia may use Table E-13 of the *SWTR Guidance Manual*. Systems that add ammonia first, or add the two chemicals concurrently, may use the protocol in Appendix G of the *SWTR Manual*. In the unlikely event that a system wishes to suggest an alternative means for determining virus inactivation, the system must provide a scientifically defensible rationale for the proposed method.

For ozone—Systems using ozone may use Table E-11 of the *SWTR Guidance Manual* to determine virus inactivation. As above, an alternative method may be proposed and defended by the water system.

4.F. Consultation between DEQ and PWS's Planning to Modify their Disinfection Practices

General—If a water system is required to develop a disinfection profile and the system subsequently decides to change its disinfection practices, it must first consult with the state (DEQ). The purpose of this requirement is to encourage the system and DEQ to work together to ensure that all potential water quality trade-offs are addressed and any changes in disinfection practice do not result in a decrease in microbial protection. Changes subject to this requirement include:

- a. Changing the point of disinfection application
- b. Changing the disinfectant
- c. Changing the disinfection process
- d. All other changes considered significant by the state, such as changes in pH, pre-treatment strategies, source water, contact basin dynamics, etc.)

Because the above list is not all-inclusive, any system that is required to develop a disinfection profile and subsequently decides to make a change in its disinfection practices must notify DEQ so that the agency can determine whether or not the proposed change is significant and will require consultation between the system and the state.

Consultation—DEQ and the water system will weigh the following factors in their consultation:

- a. Why the system is proposing a change in disinfection practice
- b. Evaluation of positive and negative impacts of the change
- c. Calculation of an alternative benchmark
- d. Examination of all known alternatives to the proposed change.

The goal of this consultation will be to ensure that any changes made by the system will represent the best available balance between microbial protection and disinfection byproduct formation potential.

4.G. Approval of Alternative Filtration Technologies

DEQ will use the *Consensus Protocol for Evaluation and Acceptance of Alternate Surface Water Filtration Technologies in Small system Applications*, developed by the Western States Workgroup and finalized in April, 1992. This protocol involves the following steps:

1. System Component Evaluation for Leaching of Contaminants.
2. Demonstration of Giardia (*and Cryptosporidium*) Removal Performance
3. On-Site Demonstration of Performance

This methodology has served the State well since implementation of the *SWTR*. Technologies that have been evaluated and approved under the joint EPA/NSF Technology Validation process will also be acceptable for use in Idaho. It is the intent of DEQ to require only the minimum information necessary to make a good public health decision about the use of alternative technologies. To this end, technologies that have been approved for use in surface water and GWUDI systems in other states will also be allowed in Idaho and will not be required to repeat the testing that was performed elsewhere, *with the exception* that the on-site performance demonstration, as described in the *Western States Protocol*, will not be waived.

Turbidity standards that must be met 95% of the time will be established by the state for each approved technology. The state will also set a turbidity standard that must not be exceeded at any time. In general, these will be the same as those required for slow sand filtration, unless on site performance testing indicates the need for a different standard. A copy of the turbidity standards determined by the state for a given technology will be provided to the water system.

4.H. Record-Keeping by the State

DEQ will keep the following records with respect to the *IESWTR*, as required by 40 CFR 142.14:

1. ***Records of turbidity measurements submitted by the water system must be kept in the system file for a minimum of one year.*** This information must be set forth in a form that makes possible comparison with the turbidity limits specified in the rule. DEQ will use an existing form that was developed for the *SWTR*, as modified to reflect the tighter standards established by the *IESWTR*. An example of this form is included as Appendix C of the Guidance. Because of the trend toward automatic logging of turbidity data, especially among large systems, use of alternative formats is acceptable as long as equivalent information is provided and it is possible to compare the turbidity readings to the limits established in the rule.
2. ***Records of disinfectant residual measurements and other parameters necessary to document disinfection effectiveness must be kept in the system file for a minimum of one year.*** Again, the Form in Appendix X is acceptable, but alternative formats with equivalent information are acceptable.

3. *The following types of records must be kept in the system file on a permanent basis:*

- a. Any case-by-case, system-specific regulatory decisions made by DEQ.
- b. Records of consultations between a system and DEQ regarding changes in disinfection practice, including the status of the consultation.
- c. Records of decisions that systems using alternative filtration technologies 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 decision must include the state-determined turbidity standards for the system. A copy of this decision must be provided to the water system.
- d. Records of systems that are required to perform filter self-assessments, and a CCP or CPE evaluation alone. (See Section 3 of this Guidance).

4.I. Annual Report on Sanitary Surveys

DEQ is required to prepare a report annually which lists all Subpart H water systems that have had a sanitary survey during the previous year and an evaluation of the State's program for conducting sanitary surveys of public water systems as required by 40 CFR 142.16(b)(3). This report will be made available for examination by the public and will be submitted to EPA.

Appendix A— Selected Excerpts from Idaho Rules Sections 003 & 302 Dealing with Sanitary Surveys

003. Definitions

Sanitary Survey. An onsite review of the water source, facilities, equipment, operation and maintenance of a public water system for the purpose of evaluating the adequacy of such source, facilities, equipment, operation and maintenance for producing and distributing safe drinking water. The sanitary survey will include, but is not limited to, the following elements:

- 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; and
- h. Operator compliance with state requirements.

Significant Deficiency. Any defect in a system's design, operation, maintenance, or administration, as well as any failure or malfunction of any system component, that the State determines to cause, or have potential to cause, risk to health or safety, or that could affect the reliable delivery of safe drinking water.

302. Sanitary Surveys. The Department shall conduct a sanitary survey of all public water systems which use surface water or ground water under the direct influence of surface water.

01. Frequency. For noncommunity water systems a sanitary survey shall be conducted every five (5) years. For community water systems a sanitary survey shall be conducted every three (3) years, except that a community water system that has been determined to have outstanding performance, according to criteria established by the Department, may have a sanitary survey conducted every five (5) years.

02. Report. A report describing the results of the sanitary survey will be provided to the water system.

03. Response Required. A water system must respond in writing not later than forty-five (45) days after receipt of the sanitary survey report describing how and on what schedule the system will address significant deficiencies identified in the survey.

04. Violation. Failure to address significant deficiencies identified in a sanitary survey that are within the control of the public water system and its governing body shall constitute a violation of these rules.

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Appendix B—List of Potentially Significant Deficiencies That May Be Noted during a Sanitary Survey

The following deficiencies have the potential to meet the state definition of a significant deficiency. This list is not intended to be prescriptive. The inspector in the field will have the final word on whether or not a particular deficiency is significant. However, each of these deficiencies has the potential to be significant and referring to this list may assist the inspector in making this decision.

Source

Location of intake near pollution source
Well construction inadequate or in deteriorated condition
Spring collection facilities inadequate or in deteriorated condition

Treatment

The hatch to a pressure filter has not been opened on a yearly basis to clean the media and to check for media loss and the condition of the underdrain system
Filter does not have adequate depth of media (e.g. less than 24 inches)
No standard operating procedure for taking a filter out of service for backwashing, for performing the backwash, or returning the filter to service
No process control plan for coagulant addition
Inadequate application of treatment chemicals
Chemical feed rates not adjusted for varying raw water quality conditions or changes in plant flow rate
Inadequate disinfection CT
Unsafe chemical storage

Distribution System

TCR sampling plan not representative of the distribution system
Negative pressures at any time
System not flushed periodically
No disinfectant residual, or HPC levels greater than 500/ml, repeatedly, at same sites
Inadequate monitoring of disinfectant residual, when required
Inadequate cross-connection controls, either at the treatment facility or in the distribution system (or failure to have a cross-connection control program)
Unacceptable system leakage which could result in entrance of contaminants
System plans unavailable or outdated
Valve locations unknown
Valves not exercised regularly or known to be inoperable

Finished Water Storage

Inadequate internal cleaning and maintenance of storage tank
Improper venting of tank
Lack of proper screening of overflow pipe and drain
Inadequate roofing (e.g. holes in the storage tank, improper hatch construction)

Pumps, Pump Facilities and Controls

Ponding of water in pump housing
Inadequate pump capacity
Lack of redundant mechanical components
Electrical hazards

Monitoring/Reporting/Data Verification

Failure to properly monitor water quality
Failure of system operator to address customer complaints regarding water quality or quantity
TCR sampling plan not available or not being followed
Chronic TCR coliform detections with inadequate remediation

Water System Management/Operation

Lack of properly trained or licensed staff as required by the state
Lack of emergency response plan
Failure to meet water supply demands or interruptions to service (inadequate pump capacity, unreliable water source, lack of auxiliary power)
Inadequate follow-up to deficiencies not in previous sanitary surveys
Spare parts inventory inadequate
Lack of accessible contact list w/phone numbers for emergency repairs or troubleshooting
Evidence of poor or infrequent communication between operator and system managers

Operator Compliance with State Requirements

Operator does not have the correct level of certification as required by regulation

Appendix C—Sample Turbidity Monitoring Form with Instructions

The following form has long been used to report treatment technique performance under the SWTR. The standards for turbidity have been tightened, otherwise the form is unchanged

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IESWTR TURBIDITY REPORT

I

(See reverse for turbidity standards and monitoring frequency)

Turbidimeter	
Calibration method:	Date:
•primary standard _____	_____
•secondary std _____	_____
•another meter _____	_____

Water System Name: _____	PWS ID #: _____	Month: _____	Year: _____
Source Name: _____	Submitted by: _____	County: _____	
PLANT TYPE: <input type="checkbox"/> conventional <input type="checkbox"/> direct			

DAY	Total Hours of Operation	Raw water turbidity (NTU)	Record finished water turbidity measurements as required on the back						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										
10										
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30										
31										

MONTHLY SUMMARY

# days plant operated this month: _____ Total # hours plant operated this month: _____ Total number of turbidity measurements: _____	Number of measurements below performance standard: _____ (see reverse for performance standards) 95% of measurements at or below standard? <input type="checkbox"/> YES <input type="checkbox"/> NO All measurements at or below 1 NTU? <input type="checkbox"/> YES <input type="checkbox"/> NO
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INSTRUCTIONS

Turbidity Monitoring Report Form

1. **GENERAL INFORMATION.** Please fill out the form completely. This form must be completed for each day of the month during which the treatment plant produced water, including weekends and holidays.
 - a. Enter the month and year for which turbidity monitoring data is being reported using a two digit number as follows: 01 – January, 02- February, 03 – March, etc.
 - b. Enter a complete name and address for the water system. Be sure to enter the county in which the water system is located.
 - c. Enter the name of the person submitting the form.
2. **TURBIDIMETER CALIBRATION.** In the box in the upper right corner, list the date(s) you calibrated your turbidimeter next to the calibration method you used.
3. **TURBIDITY MEASUREMENTS.**
 - a. **Total hours of operation.** Enter the total number of hours the filter plant produced water for each day.
 - b. **Raw water turbidity.** Measure and record the raw water turbidity (before any treatment) at least once per day the filter plant operates.
 - c. **Finished water turbidity measurement frequency.** Conventional and direct filtration plants: record turbidity measurements once every 4 hours the plant is in operation.
 - d. **Highest reading.** Record the highest turbidity measured each day the plant is in operation.
4. **MONTHLY SUMMARY.**
 - a. **# Days plant operated this month.** Count and record the total number of days this month during which the plant operated.
 - b. **Total # hours plant operated this month.** Add the hours of operation for all the days the plant operated, and record the sum.
 - c. **Total # of turbidity measurements.** Count how many *finished water* turbidity measurements you recorded for the month, and record the total # of measurements in the space provided.
 - d. **Number or measurements below the standard.** Count how many of the *finished water* turbidity measurements are below the standard for your system (see 5. below), and record the total in the space provided.
 - e. **95% of measurements below the standard?** Divide the total in d. above by the total in c. above and multiply this number by 100 to get the % below the standard. If the number is $\geq 95\%$ mark YES. If $< 95\%$ mark NO.
 - f. **All measurements below 1 NTU?** Check to see if all the *finished water* turbidity measurements are below 1 NTU. Check YES if all are ≤ 1 NTU. Check NO if one or more measurements are > 1 NTU.

$$(d/c) \times 100 = \% \text{ below standard}$$

5. TURBIDITY STANDARD.

Conventional and direct filtration ≤ 0.3 NTU

(all filtration types must also maintain turbidity at or below 1 NTU at all times)

6. CONTINUOUS TURBIDITY MONITORING.

Continuous turbidity monitoring is encouraged by the Department. If continuous measurement is used, it must be validated for accuracy on a regular basis using a protocol approved by the Department. Please contact your DEQ Regional Office for further instructions regarding validation and reporting procedures for continuous readout turbidimeters.