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Environmental Protection
Agency

The Ground Water Rule (GWR) Implementation Guidance

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Disclaimer

This document provides guidance to states, tribes, and U.S. Environmental Protection Agency (EPA) exercising primary enforcement responsibility under the Safe Drinking Water Act (SDWA) and contains EPA's current policy recommendations for complying with the Ground Water Rule (GWR). Throughout this document, the terms "state" and "states" are used to refer to all types of primacy agencies including U.S. territories, Indian tribes, and EPA.

The statutory provisions and EPA regulations described in this document contain legally binding requirements. This document is not a regulation itself, nor does it change or substitute for those provisions and regulations. Thus, it does not impose legally binding requirements on EPA, states, or public water systems. This guidance does not confer legal rights or impose legal obligations upon any member of the public.

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The general description provided here may not apply to a particular situation based upon the circumstances. Interested parties are free to raise questions and objections about the substance of this guidance and the appropriateness of the application of this guidance to a particular situation. EPA and other decision makers retain the discretion to adopt approaches on a case-by-case basis that differ from those described in this guidance, where appropriate.

Mention of trade names or commercial products does not constitute endorsement or recommendation for their use.

This is a living document and may be revised periodically without public notice. EPA welcomes public input on this document at any time. Guidance provided in this document reflects provisions published on November 8, 2006 at 71 FR 65574 and November 21, 2006 at 71 FR 67427.

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Acronyms and Abbreviations

ASDWA	Association of State Drinking Water Administrators
CCR	Consumer Confidence Report
CDC	Centers for Disease Control
CFR	*Code of Federal Regulations*
CT	The Residual Concentration of Disinfectant (mg/L) Multiplied by the Contact Time (in minutes)
CWSs	Community Water Systems
DBPs	Disinfectants and Disinfection Byproducts
EPA	U.S. Environmental Protection Agency
FR	*Federal Register*
gpm	Gallon Per Minute
GWR	Ground Water Rule
GWS	Ground Water System
GWUDI	Ground Water Under the Direct Influence
HQ	Headquarters
HSA	Hydrogeologic Sensitivity Assessment
MCL	Maximum Contaminant Level
MCLG	Maximum Contaminant Level Goal
M-DBP Cluster	Microbial-Disinfectants/Disinfection Byproducts Cluster
MMWR	Morbidity and Mortality Weekly Report
MRDL	Maximum Residual Detection Level
MWCO	Molecular Weight Cut-Off
NCWS	Noncommunity Water System
NF	Nanofiltration
NIPDWR	National Interim Primary Drinking Water Regulation
NPDWR	National Primary Drinking Water Regulation
NRC	National Research Council
NTNCWS	Nontransient Noncommunity Water System
O&M	Operations and Maintenance
OECA	Office of Enforcement and Compliance Assurance
OGC	Office of General Counsel
OGWDW	Office of Ground Water and Drinking Water
ORC	Office of Regional Counsel
psi	Pound-force Per Square Inch
PWS	Public Water System
PWSS	Public Water System Supervision
Q&A	Question and Answer
RO	Reverse Osmosis
SBREFA	Small Business Regulatory Enforcement Fairness Act
SDWA	Safe Drinking Water Act

SDWIS	Safe Drinking Water Information System
SNC	Significant Non-complier
Stage 1 DBPR	Stage 1 Disinfectants and Disinfection Byproducts Rule
Stage 2 DBPR	Stage 2 Disinfectants and Disinfection Byproducts Rule
SWAP	Source Water Assessment Program
SWTR	Surface Water Treatment Rule
TCR	Total Coliform Rule
TNCWS	Transient Noncommunity Water System
TT	Treatment Technique
UV	Ultraviolet
WHPP	Wellhead Protection Program

Introduction

This document provides guidance to states and the U.S. Environmental Protection Agency (EPA) exercising primary enforcement responsibility under the Safe Drinking Water Act (SDWA), concerning how the EPA interprets the Ground Water Rule (GWR) promulgated by EPA under the SDWA. It also provides guidance to the public and the regulated community on how EPA intends to exercise its discretion in implementing the statute and regulations. This guidance is designed to implement national policy on these issues. Throughout this document, the terms "state" and "states" are used to refer to all types of primacy agencies including states, U.S. territories, Indian tribes, and EPA.

The SDWA provisions and EPA regulations described in this document contain legally binding requirements. This document does not substitute for those requirements, nor is it a regulation itself. It does not impose legally binding requirements on EPA, states, or the regulated community and may not apply to a particular situation based upon the circumstances. EPA and state decision makers retain the discretion to adopt approaches on a case-by-case basis that differ from this guidance, where appropriate. Any decisions regarding a particular facility will be made based on the applicable statutes and regulations. Therefore, interested parties are free to raise questions and objections about the appropriateness of the application of this guidance to a particular situation. EPA will then consider whether or not the recommendations or interpretations in the guidance are appropriate in that situation based on the law and regulations. EPA may change this guidance in the future.

This manual contains the following sections:

- **Section 1** summarizes the rule requirements of the GWR and presents a timetable of important dates.
- **Section 2** lists the "stand-alone" guidance materials that will help states and public water systems (PWSs) adopt each new requirement.
- **Section 3** discusses state implementation activities.
- **Section 4** covers state primacy revision requirements, including a detailed time frame for application review and approval. This section also contains guidance and references to help states adopt each new special primacy requirement included in the GWR.
- **Section 5** addresses violation determinations and associated reporting requirements to assist states in their compliance activities.
- **Section 6** provides examples of scenarios requiring public notification and/or special notices, and includes sample language to include in public notices, special notices, and Consumer Confidence Reports (CCRs).

The appendices of this document also provide information that will be useful to states and EPA throughout the primacy revision application process.

- **Appendix A** contains the primacy revision application crosswalk for the GWR.
- **Appendix B** contains a copy of the final GWR.

- **Appendix C** contains fact sheets and a quick reference guide for the GWR.
- **Appendix D** presents flowcharts to help states and systems implement the GWR.
- **Appendix E** contains a stand alone version of the State Primacy Revision Checklist and Example Forms.

Please note that, in several sections, the guidance makes suggestions and offers alternatives that go beyond the minimum requirements indicated. EPA does this to provide information and/or suggestions that may be helpful to implementation efforts. Such suggestions are prefaced by "may" or "should" and are to be considered advisory. They are not required elements of the GWR.

Section 1

Rule Requirements

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1.1 Introduction

EPA published the Ground Water Rule (GWR) in the *Federal Register* on November 8, 2006 (*Federal Register* Volume 71, Number 216, 65574) and a rule correction on November 21, 2006 (*Federal Register* Volume 71, Number 224, 67427). Copies of the *Federal Register* are available at:

- www.epa.gov/fedrgstr/EPA-WATER/2006/November/Day-08/w8763.pdf.
- www.epa.gov/fedrgstr/EPA-WATER/2006/November/Day-21/w8763.pdf.

The GWR builds upon the Total Coliform Rule (TCR) by addressing the health risks of fecal contamination in community water systems (CWSs) and noncommunity water systems (NCWSs) (i.e., nontransient noncommunity water systems [NTNCWSs] and transient noncommunity water systems [TNCWSs]) that use ground water.

The GWR does not apply to public water systems (PWSs) that combine all of their ground water with surface water before treatment (Subpart H systems). The GWR also does not apply to systems using ground water sources that have been determined by the state to be ground water under the direct influence of surface water (GWUDI). A GWUDI source refers to water beneath the surface of the ground with significant occurrence of insects or other microorganisms, algae, or large-diameter pathogens, or significant and relatively rapid shifts in water characteristics (e.g., temperature, conductivity) that closely correlate to climatological or surface water conditions. These systems must comply instead with requirements for surface water systems.

Key provisions of the GWR include:

- Periodic on-site reviews and inspections of ground water systems (GWSs) requiring evaluation of eight specific sanitary survey elements and identification of significant deficiencies.

- Requirements to correct significant deficiencies and eliminate fecal contamination through specified actions.

- Triggered source water monitoring to test for the presence of fecal indicators (*E. coli*, enterococci, or coliphage) in the sample.

- Assessment source water monitoring, as directed by the state, to target high risk GWSs.

- Compliance monitoring to ensure that treatment technologies, installed to treat drinking water, reliably achieve at least 99.99 percent (4-log) inactivation or removal of viruses.

Section 1 of this guidance manual also offers suggestions and alternatives that go beyond the minimum primacy agency requirements specified in the GWR. Such suggestions are prefaced by “may” or “should” and are to be considered advisory.

1.1.1 History

The Centers for Disease Control and Prevention (CDC) maintain a database of information on waterborne disease outbreaks in the United States. The CDC defines a waterborne disease outbreak as occurring when at least two persons experience a similar illness after ingesting drinking water from the same source or system.

The CDC reports[1] that between 1991 (the year in which the TCR went into effect) and 2000, GWSs (both CWSs and NCWSs) were associated with 68 outbreaks that caused 10,926 illnesses. These accounted for 51 percent of all waterborne disease outbreaks in the United States. The major deficiency in GWSs was source water contamination, which is either untreated or inadequately treated ground water. Contaminated source water (classified by the CDC as outbreaks caused by untreated ground water and treatment deficiencies) was the cause of 79 percent of the outbreaks in GWSs (63 percent of CWS outbreaks and 86 percent of NCWS outbreaks).

Of the 68 outbreaks in GWSs, 14 (21 percent) were associated with specific bacterial pathogens. The fecal bacterial pathogen, *Shigella*, caused more reported outbreaks (7 percent) than any other identifiable agent. Identified viral pathogens were associated with four (6 percent) reported outbreaks. Etiologic agents were not identified in 39 (57 percent) outbreaks; however, EPA suspects that many of these outbreaks were caused by viruses, given that it is generally more difficult to analyze for viral pathogens than bacterial pathogens.

Despite the data, the National Research Council (NRC) believes that the waterborne disease outbreaks in the CDC database (for both surface and ground waters) represent a small percentage of the actual number. In practice, most waterborne outbreaks in water systems are not recognized until a sizable proportion of the population is ill.

EPA estimates that approximately 70 percent of GWSs provide either untreated ground water or provide treatment of less than 4-log virus inactivation or removal.[2] Approximately 18 percent (20 million) of people served by PWSs that use ground water sources receive water that has not been disinfected, while over 60 percent (70 million) receive either water that has not been disinfected or water treated to less than 4-log inactivation or removal of viruses. EPA also recognizes that existing outbreak and source water fecal contamination occurrence data do not appear to support mandatory disinfection of all GWSs. However, the data indicate that outbreaks in GWSs are a problem, and source contamination and inadequate treatment (or treatment failures) are responsible for the great majority of outbreaks.

1.1.2 Development of the Ground Water Rule

The Agency's goal in developing the GWR is to reduce the risk of illness caused by microbial contamination in PWSs relying on ground water. As part of the 1986 Amendments to the Safe Drinking Water Act (SDWA), Congress directed EPA to promulgate a National Primary Drinking Water Regulation (NPDWR) requiring disinfection as a treatment technique for all PWSs, including those served by surface water and ground water. In 1987, EPA began developing a rule to cover GWSs. From

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[1] The data in this and the subsequent two paragraphs are reported in the following sources:

Barwick, R.S., D.A. Levy, G.F. Craun, M.J. Beach, and R.L. Calderon. 2000. Surveillance for waterborne-disease outbreaks—United States, 1997–1998. Morbidity and Mortality Weekly Report (MMWR). 49(SS04):1–35.

Kramer, M.H., B.L. Herwaldt, G.F. Craun, R.L. Calderon, and D.D. Juranek. 1996. Waterborne disease: 1993–1994. Journal AWWA. 88(3):66–80.

Lee, S.H., D.A Levy, G.F. Craun, M.J. Beach, and R.L. Calderon. 2002. Surveillance for Waterborne-Disease Outbreaks–United States, 1999–2000. MMWR. 51(SS08):1– 28.

Levy, D.A., M.S. Bens, G.F. Craun, R.L. Calderon, and B.L. Herwaldt. 1998. Surveillance for Waterborne-Disease Outbreaks—United States, 1995–1996. MMWR. 47(SS–5):1–34.

Moore, A.C., B.L. Herwaldt, G.F. Craun, R. L. Calderon, A.K. Highsmith, and D.D. Juranek. 1993. Surveillance for waterborne disease outbreaks—United States, 1991–1992. MMWR. Surveillance Summary SS–5, U.S. CDC. 42(SS–05):1–22.

[2] USEPA, 2006d. *Economic Analysis for the Final Ground Water Rule*. EPA 815-R-06-014

1990 to 1997, EPA conducted technical discussions on a number of issues, primarily to establish a reasonable means of determining whether a ground water source was vulnerable to fecal contamination and, thus, pathogens. This effort was accomplished through ad hoc working groups with the participation of EPA Headquarters and regional offices, states, local governments, academicians, and trade associations.

The SDWA was amended in August 1996 and, as a result, several statutory provisions were added establishing new drinking water requirements. Specifically, Congress required under section 1412(b)(8) that EPA develop regulations specifying the use of disinfectants for GWSs "as necessary." These amendments established a new regulatory framework that required EPA to set criteria for states to determine whether GWSs need to disinfect.

EPA held a series of stakeholder meetings to present a summary of the findings resulting from technical discussions held since 1990 and from information generated by internal EPA working groups with the intention of developing disinfection criteria for GWSs. The purpose of these meetings was to engage all interested stakeholders in the analysis of data to develop the GWR. In addition, EPA received valuable input from small system operators as part of an Agency outreach initiative under the Small Business Regulatory Enforcement Fairness Act (SBREFA).

In addition to stakeholder input, EPA has used the results of numerous field and laboratory studies conducted over the past 20 years to characterize the epidemiologic, hydrogeologic, well construction, microbial-source attributes, and treatment technology considerations in the development of the GWR.

1.1.3 Benefits of the Ground Water Rule

1.1.3.1 Quantifiable Health Benefits

The primary benefits of the GWR come from reductions in the risk of microbial illness from drinking water. In particular, the GWR focuses on reducing illness and death associated with viral infection. It is likely that the value estimated in the illness calculations used to estimate the benefits of this rule underestimate the true benefit because they do not include pain and suffering associated with viral and bacterial illnesses. According to the risk assessment performed for the Economic Analysis,[3] the annualized present value of the GWR is $19.7 million, with a 90-percent confidence interval of $6.5 to $45.4 million. This result is based on the number of endemic viral illnesses and deaths avoided attributable to this rule. The GWR will also decrease bacterial illness and death associated with fecal contamination of ground water.

1.1.3.2 Non-Quantifiable Health Benefits

By reducing bacterial illnesses and deaths, as well as illnesses and deaths associated with viruses, the GWR provides significant health benefits beyond the quantifiable health benefit estimates. The GWR will also result in non-health benefits, such as avoided outbreak response costs and increased information that will provide added benefits to the systems and their customers, by providing information to the water system operator to ensure the water system continues to provide safe drinking water. The GWR will also provide the benefit of reducing uncertainty regarding drinking water safety, which may lead to reduced costs associated with individuals seeking alternative drinking water sources or auxiliary treatment for their existing sources.

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[3] USEPA, 2006d. *Economic Analysis for the Final Ground Water Rule*. EPA 815-R-06-014

1.2 Requirements of the Rule: Public Water Systems

The following rule requirements are from the GWR published in the *Federal Register* on November 8, 2006 (*Federal Register* Volume 71, Number 216, 65574 and a rule correction on November 21, 2006 (*Federal Register* Volume 71, Number 224, 67427). Copies of the *Federal Register* are available at:

- www.epa.gov/fedrgstr/EPA-WATER/2006/November/Day-08/w8763.pdf.
- www.epa.gov/fedrgstr/EPA-WATER/2006/November/Day-21/w8763.pdf.

For a copy of the complete rule language, see Appendix B, or visit EPA's Web site at www.epa.gov/safewater/disinfection/gwr/regulation.html.

This section provides a brief summary of the rule requirements. GWR requirements are explained in more detail in section 3.

1.2.1 Applicability and Compliance Dates

For more detailed information about to whom this rule applies and the applicable compliance dates, see section 1.4 of this document.

1.2.1.1 To Whom Does The Rule Apply?

The GWR addresses fecal contamination in systems that use wells or other ground water sources. The rule applies to CWSs and NCWSs, regardless of size. The GWR applies to all PWSs that:

- Rely entirely on one or more ground water sources;
- Are consecutive systems that receive finished ground water; or,
- Mix surface and ground water, where ground water is added directly to the distribution system and provided to consumers without treatment equivalent to the treatment provided for surface water.

For the purposes of this document, the term "ground water system" (or GWS) will be used to refer to a system to which the GWR applies.

1.2.1.2 What Are The Compliance Dates?

Most of the GWR requirements take effect December 1, 2009. These requirements include:

- Triggered source water monitoring.
- Corrective action if a significant deficiency is identified.
- Corrective action if ground water source samples test positive for fecal contamination.
- Written notification from GWSs providing at least 4-log treatment of viruses that demonstrates the treatment effectiveness.
- Assessment source water monitoring as directed by the state.

GWSs bringing a new ground water source into service after November 30, 2009 must either meet the triggered source water monitoring requirements of the GWR or provide 4-log treatment of viruses and conduct compliance monitoring. After that date, new systems with 4-log treatment of viruses must provide written notification to the state that they are providing at least 4-log treatment of viruses before or at the first customer and begin conducting compliance monitoring.

States must complete all initial sanitary surveys for CWSs by December 31, 2012 and for NCWSs (and CWSs that qualify to have sanitary surveys conducted once every 5 years) by December 31, 2014.

1.2.2 Sanitary Surveys for GWSs [40 CFR 141.401]

GWSs must provide, at the state's request, any existing information that would allow the state to perform a sanitary survey. Examples of existing information that may be necessary to perform the survey include past survey reports, source water vulnerability assessments, monitoring and maintenance records, construction details of system infrastructure components, and operations and management-related records.

As Table 1-1 summarizes, the state is required to perform a sanitary survey for CWSs every 3 years (except for CWSs that meet certain conditions outlined in sections 3.6.1 and 4.4 of this guidance manual) and for NCWSs (and CWSs that meet the conditions outlined in sections 3.6.1 and 4.4) every 5 years.

Table 1-1. Sanitary Survey Requirements by System Type

System Type	Timeframe	All Initial Sanitary Surveys Completed by
CWSs	Every 3 years	12/31/2012
CWSs providing at least 4-log treatment of viruses before or at the first user for all its ground water sources or CWSs that have an outstanding performance record, as determined by the state, and no TCR MCL or monitoring violations since last sanitary survey.[1]	Every 5 years	12/31/2014
NCWSs		

1. The GWR allows states to define outstanding performance. For additional guidance on determining outstanding performance, see section 4.4 of this document or refer to EPA's *Ground Water Sanitary Survey Guidance Manual*.

The GWR specifies eight elements integral to an effective sanitary survey. These elements are discussed in EPA's guidance on how to conduct a sanitary survey of a PWS that is served by ground water (*Sanitary Survey Guidance Manual For Ground Water Systems*. EPA 815-R-08-015, October 2008). This document is available at www.epa.gov/safewater/disinfection/gwr/compliancehelp.html and from the Safe Drinking Water Hotline (800) 426-4791. The eight elements are:

- Source (protection, physical components, and condition).
- Treatment.
- Distribution System.
- Finished Water Storage.
- Pumps, Pump Facilities, and Controls.
- Monitoring, Reporting, and Data Verification.
- Water System Management and Operations.
- Operator Compliance with State Requirements.

1.2.3 Ground Water Source Microbial Monitoring [40 CFR 141.402]

The GWR has three general categories of ground water source microbial monitoring requirements: 1) triggered source water monitoring, 2) additional source water sampling, and 3) assessment source water monitoring. This section provides a brief summary of ground water source microbial monitoring requirements. Monitoring requirements are explained in more detail in section 3.

1.2.3.1 Triggered Source Water Monitoring

Any GWS that does not provide at least 4-log treatment of viruses before or at the first customer and is notified of a total coliform-positive sample collected in compliance with the TCR (40 CFR 141.21), must conduct triggered source water monitoring. Triggered monitoring requirements are discussed briefly here and in more detail in section 3.2.3.

Systems providing 4-log treatment of viruses must notify their state that they provide treatment and must conduct compliance monitoring (see section 1.2.4.1), or they will also be required to conduct triggered source water monitoring if they are notified of a total coliform-positive sample collected in compliance with the TCR. Systems providing 4-log treatment (who are not providing that treatment as a result of a corrective action) can opt to conduct triggered source water monitoring instead of compliance monitoring, as long as the state allows it.

When a system is notified of a total coliform-positive sample, the system must collect at least one ground water source sample from each source in use at the time the total coliform-positive sample was collected. If approved by the state, a system with more than one ground water source may meet this monitoring requirement by sampling a representative source or sources. In addition, the state may direct a system to submit for state approval a triggered source water monitoring plan. The triggered source water monitoring plan would identify which ground water sources are representative of each monitoring site in the system's TCR sample siting plan and would be used for representative sampling.

The triggered source water sample must be analyzed for the presence of an approved fecal indicator. If the triggered source water sample is fecal indicator-positive, the GWS must either take corrective action, as directed by the state, or if corrective action is not required and the sample is not invalidated by the state, the system must collect five additional source water samples and analyze them for the presence of an approved fecal indicator (see section 1.2.3.2).

The GWR allows states to determine that the cause of a total coliform-positive sample collected in compliance with the TCR is directly related to the distribution system and should therefore not trigger fecal indicator source water monitoring. States may also invalidate a fecal indicator-positive ground water source sample under conditions specified in the GWR. If a fecal indicator-positive source sample is invalidated, the system must collect another source water sample within 24 hours of being notified by the state of its invalidation decision and have it analyzed for the same fecal indicator that was tested for in the invalidated sample.

1.2.3.2 Additional Source Water Sampling

If the state does not require corrective action in response to a fecal indicator-positive triggered source water sample, the system must collect five additional source water samples (from the same source) within 24 hours of being notified of the fecal indicator-positive sample. These additional source water samples should be analyzed for the same fecal indicator as was analyzed in the triggered source water sample. If any of the five additional source water samples are fecal indicator-positive, the GWS must take corrective action.

1.2.3.3 Assessment Source Water Monitoring

As a complement to the triggered source water monitoring provision, states may require GWSs to conduct assessment source water monitoring, as needed. This flexible provision gives states the opportunity to target high risk systems for additional source water monitoring and require corrective action, if necessary. EPA recommends that states require GWSs that are most susceptible to fecal contamination to conduct assessment monitoring. States have the flexibility to base assessment source water monitoring, and its frequency, on the presence or absence of potential sources of fecal contamination identified by their existing source water protection program. Assessment source water monitoring requirements are discussed in more detail in sections 3.2.6 and 3.72.

1.2.4 Treatment Technique Requirements For GWSs [40 CFR 141.403]

The GWR treatment technique requirements apply to all GWSs when a significant deficiency is identified or when a source water sample indicates that a ground water source is fecal indicator-positive. The GWR requires these systems to consult with the state within 30 days of:

- A significant deficiency is identified, or
  - A "significant deficiency" is defined as a defect in design, operation, or maintenance, or a failure or malfunction of the sources, treatment, storage, or distribution system that the state determines to be causing, or has potential for causing, the introduction of contamination into the water delivered to consumers.
- The initial source sample (if corrective action is required by the state) has tested positive for fecal contamination, or
- One of the five additional ground water source samples has tested positive for fecal contamination.

As part of their consultation with the state, the systems must address the appropriate corrective action they should take in response to the deficiency or positive sample. In the situation where a significant deficiency is identified and the system already provides 4-log treatment of viruses, the system must nonetheless take corrective action (unless the treatment in place is already addressing the deficiency). The system must implement at least one of the following corrective actions:

- Correct all significant deficiencies.
- Provide an alternate source of water.
- Eliminate the source of contamination.
- Provide treatment that reliably achieves at least 4-log treatment of viruses (using inactivation, removal, or a state-approved combination of 4-log virus inactivation and removal) before or at the first customer for the ground water source.

Within these 120 days (or the time period specified by the state), the system must either:

- Have completed corrective action according to the applicable state guidance, direction, and plan review process.
- Be in compliance with a state-approved corrective action plan and schedule.

In addition to the treatment technique requirements, CWSs with source water fecal contamination and CWSs and NCWSs with significant deficiencies are required to make special notice (in addition to associated public notification requirements) to the public annually until appropriate corrective action has been taken. See section 1.2.9 and section 6 for additional information on notification requirements.

1.2.4.1 Treatment Technique Compliance Monitoring [40 CFR 141.403(b)]

In order **not** to be subject to triggered source water monitoring, a GWS must notify the state that it provides at least 4-log treatment of viruses before or at the first customer by December 1, 2009, and is therefore not subject to the triggered source water monitoring requirements. The written notification must include engineering, operational and other information requested by the state so that the state can evaluate the submission. The system must then begin compliance monitoring by December 1, 2009. GWSs that provide at least 4-log treatment of viruses before or at the first customer on or after December 1, 2009, must notify the state that they provide treatment and conduct compliance monitoring, or they must comply with the GWR's triggered source water monitoring requirements.

Compliance Monitoring

Systems that use chemical disinfection and serve more than 3,300 people must continuously monitor their disinfectant concentration. Systems must maintain the minimum disinfectant residual concentration determined by the state. If continuous monitoring equipment fails, systems must take grab samples every 4 hours until the equipment is repaired. The equipment must be repaired within 14 days.

Systems that use chemical disinfection and serve 3,300 people or fewer must take daily grab samples or meet the continuous monitoring requirements described above for systems serving more than 3,300 people. If any daily grab sample measurement falls below the minimum state-required residual disinfectant concentration, the system must take follow-up samples every 4 hours until the residual is restored to the required level.

Systems using membrane filtration for 4-log treatment of viruses must monitor the membrane filtration process according to state-specified monitoring requirements and must operate the membrane filtration according to all state-specified compliance requirements. States can refer to EPA's *Membrane Filtration Guidance Manual* (EPA 815-R-06-009, November 2005) for information on membrane filtration system design and operation, membrane filtration testing requirements, and startup and implementation considerations.

Systems may use alternative treatment technologies (e.g., ultraviolet [UV] radiation) approved by the state, if the alternative treatment technology, alone or in combination (e.g., filtration with UV, filtration with chlorination) can reliably provide at least 4-log treatment of viruses. States can refer to EPA's *Ultraviolet Disinfection Guidance Manual for the Final Long Term 2 Enhanced Surface Water Treatment Rule* (EPA 815-R-06-007, November 2006) for information on UV system design, verification, and operation. Systems must monitor the alternative treatment according to state-specified monitoring requirements, and must operate the alternative treatment according to compliance requirements established by the state.

New Sources

GWSs that bring a new ground water source into service after November 30, 2009, must meet the triggered source water monitoring requirements or provide 4-log treatment of viruses. If directed by the state, a system placing a new ground water source into service after November 30, 2009, must also conduct assessment source water monitoring. The state will direct the system whether source water assessment monitoring must begin before the ground water source is used to provide water to the public. For more information on source water monitoring, refer to EPA's *Ground Water Rule Source Water Monitoring Methods Guidance Manual* (EPA 815-R-07-019, July 2007).

If the system provides 4-log treatment of viruses, it must provide written notification to the state that they are providing at least 4-log treatment of viruses—using inactivation, removal, or a state-approved combination of 4-log inactivation and removal—before or at the first customer. The written notification must include engineering, operational and other information requested by the state so that the state can evaluate the submission. The system must conduct compliance monitoring before or at the first customer in order to demonstrate the effectiveness and reliability of the treatment source within 30 days of placing the source in service. If the system discontinues 4-log treatment of viruses the system is subject to the source water monitoring and analytical methods requirements of 40 CFR 141.402.

1.2.5 Public Water System Reporting Requirements [40 CFR 141.405(a)]

Table 1-2. GWS Requirements for Reporting to the State Under the GWR

GWS Requirements for Reporting to the State	Rule Cite
In addition to the requirements of 40 CFR 141.31, GWSs must provide the following information to the state:	40 CFR 141.405(a)
GWSs conducting compliance monitoring under 40 CFR 141.403(b): Must notify the state any time they fail to meet any state-specified requirements including, but not limited to: minimum residual disinfectant concentration; membrane operating criteria or membrane integrity; and, alternative treatment operating criteria, if operation in accordance with the criteria or requirements is not restored within 4 hours. The system must notify the state as soon as possible, but no later than the end of the next business day.	40 CFR 141.405(a)(1)
GWSs after completing any corrective action: Must notify the state within 30 days of completion of the corrective action.	40 CFR 141.405(a)(2)
GWSs subject to the requirements of 40 CFR 141.402(a) that do not conduct source water monitoring under 40 CFR 141.402(a)(5)(ii): Must provide documentation to the state within 30 days of the total coliform-positive sample that it met the state criteria.	40 CFR 141.405(a)(3)

1.2.6 Public Water System Recordkeeping Requirements [40 CFR 141.405(b)]

Table 1-3. GWS Recordkeeping Requirements Under the GWR

GWS Recordkeeping Requirements	Rule Cite
In addition to the requirements of 40 CFR 141.33, GWSs must maintain the following information in their records:	40 CFR 141.405(b)
GWSs must maintain: Documentation of corrective actions. Documentation shall be kept for a period of not less than 10 years.	40 CFR 141.405(b)(1)
GWSs must maintain: Documentation of special notice to the public [40 CFR 141.403(a)(7)]. Documentation shall be kept for a period of not less than 3 years.	40 CFR 141.405(b)(2)
GWSs must maintain: Records of decision under 40 CFR 141.402(a)(5)(ii) and records of invalidation of fecal indicator-positive ground water source samples. Documentation shall be kept for a period of not less than 5 years.	40 CFR 141.405(b)(3)
Consecutive GWSs must maintain: Documentation of notification to the wholesale system(s) of total coliform-positive samples that are not invalidated under 40 CFR 141.21(c). Documentation shall be kept for a period of not less than 5 years.	40 CFR 141.405(b)(4)
GWSs (including wholesale systems) that are required to perform compliance monitoring must maintain: Records of the state-specified minimum disinfectant residual. Documentation shall be kept for a period of not less than 10 years.	40 CFR 141.405(b)(5)(i)
GWSs (including wholesale systems) that are required to perform compliance monitoring must maintain: Records of the lowest daily disinfectant residual concentration and records of the date and duration of any failure to maintain the state-prescribed minimum residual disinfectant concentration for a period of more than 4 hours. Documentation shall be kept for a period of not less than 5 years.	40 CFR 141.405(b)(5)(ii)
GWSs (including wholesale systems) that are required to perform compliance monitoring must maintain: Records of state-specific compliance requirements for membrane filtration and of parameters specified by the state for state-approved alternative treatment and records of the date and duration of any failure to meet the membrane operating, membrane integrity, or alternative treatment operation requirements for more than 4 hours. Documentation shall be kept for a period of not less than 5 years.	40 CFR 141.405(b)(5)(iii)

1.2.7 Public Notification of Drinking Water Violations [40 CFR 141.402 and 40 CFR 141.403(a)]

Table 1-4. GWS Public Notification Requirements Under the GWR

GWS Public Notification Requirements	Rule Cite
GWSs that detect *E. coli*, enterococci, or coliphage in a source water sample, as specified in 40 CFR141.402(a) and 40 CFR141.402(b) except when the state has invalidated the sample as specified in 40 CFR141.402(d), must provide Tier 1 public notice.	40 CFR 141.202(a) Table 1(8)
GWSs that fail to take corrective action or be in compliance with a state-approved corrective action plan within 120 days following a significant deficiency or fecal indicator-positive source water sample must provide Tier 2 public notice.	40 CFR 141.203(a) Table 1(4)
GWSs that fail to comply with a state-approved schedule and plan, including state-specified interim measures, to correct a significant deficiency and/or eliminate fecal contamination in a ground water source at any time after state approval or state direction pursuant to 40 CFR 141.403(a)(2) must provide Tier 2 public notice.	40 CFR 141.203(a) Table 1(1)
GWSs that fail to maintain at least 4-log treatment of viruses (using inactivation, removal, or a state-approved combination of 4-log virus inactivation and removal) before or at the first customer under 40 CFR 141.403(a) must provide Tier 2 public notice.	40 CFR 141.203(a) Table 1(4)
GWSs that fail to conduct required ground water source monitoring, including triggered source water monitoring when a system has a total coliform-positive sample in the distribution system [40 CFR 141.402(a)(2)], additional source water monitoring following a fecal indicator-positive source water sample (if the state does not require corrective action) [40 CFR 141.402(a)(3)], and, if required by the state, assessment source water monitoring [40 CFR 141.402(b)], must provide Tier 3 public notice.	40 CFR141.204(a) Table 1(1)
GWSs that fail to conduct compliance monitoring (for GWSs that are required to conduct compliance monitoring) must provide Tier 3 public notice.	40 CFR141.204(a) Table 1(1)

1.2.8 CCR Requirements [40 CFR 141.153]

CWSs are required to report GWR treatment technique violations and monitoring violations in their Consumer Confidence Reports (CCRs). In addition, the GWR has special notice requirements for CWS requiring them to report additional information in their CCRs. These special notice requirements are summarized in section 1.2.9 and described in more detail in section 3.8.3. More information on general CCR requirements can be found at www.epa.gov/safewater/ccr1.html.

1.2.9 Special Notice Requirements [40 CFR 141.403(a)(7)]

The GWR requires special notice under specific circumstances. Special notice is a separate requirement from public notification and CCR requirements. For CWSs, special notice is made in the CCR. NCWSs will be required to prepare and distribute special notice in a manner approved by their state. For some of the circumstances requiring special notice, systems will not have committed a violation. Circumstances that require special notice differ for CWSs and NCWSs.

Community Water Systems

A CWS that receives notice from the state of a significant deficiency or notification of a fecal indicator-positive source water sample that is not invalidated by the state must inform its customers of the fecal indicator-positive ground water sample or of any significant deficiency that is uncorrected in their next CCR. CWSs with a fecal indicator-positive ground water sample must include certain mandatory elements in their special notice, including new health effects language for fecal indicators. More details about these requirements are provided in section 3.8 and an example of a CWS special notice is provided in section 6.

The system must continue to inform the public with a special notice annually until the state determines the particular significant deficiency is corrected or the fecal contamination in the ground water source was addressed.

Noncommunity Water Systems

NCWSs must inform the public served by their water systems in a manner approved by the state of any significant deficiency that has not been corrected within 12 months of being notified by the state (or earlier if directed by the state). The system must continue to inform the public annually until the significant deficiency is corrected.

1.3 Requirements of the Rule: States or Other Primacy Agencies

The following rule requirements are from the GWR published in the *Federal Register* on November 8, 2006 (*Federal Register* Volume 71, Number 216, 65574) and the rule correction published November 21, 2006 (*Federal Register* Volume 71, Number 224, 67427). Copies of the *Federal Register* are available at:

- www.epa.gov/fedrgstr/EPA-WATER/2006/November/Day-08/w8763.pdf.
- www.epa.gov/fedrgstr/EPA-WATER/2006/November/Day-21/w8763.pdf.

For a copy of the actual rule language, including the published rule correction, see Appendix B, or visit EPA's Web site at www.epa.gov/safewater/disinfection/gwr.

Section 4 of this guidance manual provides a more detailed discussion of the GWR's primacy requirements.

In order to receive primacy for the GWR, states must adopt regulations no less stringent than the GWR requirements. States must submit revisions to their programs, regulations, or authorities no later than November 8, 2008, although states can request an extension of up to 2 years (i.e., until November 8, 2010). Guidance on primacy requirements is provided in Section 4.

The GWR is structured to give states flexibility to incorporate the rule's requirements into existing state programs that are diverse in scope. States are given latitude to define several GWR requirements, including some monitoring requirements, definitions of significant deficiencies, and design and operating criteria. As a result, states will need to address numerous special primacy requirements in their primacy packages. Section 4 provides guidance to states on preparing primacy materials for the GWR.

Primacy requirements of the GWR include:

- Legal authority to ensure that GWSs conduct source water monitoring, including determination of the appropriate fecal indicators to use for source water monitoring.
- Legal authority to require correction of significant deficiencies and source water fecal contamination.
- Legal authority to require source water monitoring, and adoption and implementation of adequate procedures for sanitary surveys.
- Legal authority to ensure that GWSs consult with the state regarding corrective action(s).

1.3.1 Special Primacy Requirements [40 CFR 142.16(o)]

In addition to adopting basic primacy requirements specified in 40 CFR 142, states are required to adopt primacy provisions pertaining to specific regulations where implementation of the rule involves activities beyond general primacy provisions. States must include these rule-distinct provisions in an application for approval or revision of their programs. Refer to section 4.4 for additional information on special primacy requirements.

1.3.2 Records Kept by States [40 CFR 142.14(d)(17)]

Table 1-5. State Recordkeeping Requirements

State Recordkeeping Requirements	Rule Cite
Each State which has primary enforcement responsibility shall retain, for not less than 12 years, files which shall include for each such public water system in the state:	40 CFR 142.14(d)
Records of the currently applicable or most recent state determinations, including all supporting information and an explanation of the technical basis for each decision, made under the following provisions of the GWR:	40 CFR 142.14(d)(17)
Section 142.16(o)(2)(v) – Records of written notices of significant deficiencies	40 CFR 142.14(d)(17)(i)
Section 141.403(a)(5)(ii) – Records of corrective action plans and schedule approval and/or state-specified interim measures.	40 CFR 142.14(d)(17)(ii)
Section 142.16(o)(4) – Records of confirmation that a significant deficiency has been corrected or source water fecal contamination has been addressed.	40 CFR 142.14(d)(17)(iii)
Section 141.402(a)(5) – Records of state determinations and records of GWS documentation for not conducting triggered source water monitoring.	40 CFR 142.14(d)(17)(iv)
Section 141.402(d) – Records of state determination to invalidate fecal indicator-positive source water samples.	40 CFR 142.14(d)(17)(v)
Section 141.402(a)(2)(ii) – Records of state approval of source water monitoring plans.	40 CFR 142.14(d)(17)(vi)

State Recordkeeping Requirements	Rule Cite
Section 142.16(o)(4)(ii) – Records of notices of the minimum residual disinfection concentration (when using chemical disinfection) needed to achieve at least 4-log virus inactivation before or at the first customer.	40 CFR 142.14(d)(17)(vii)
Sections 142.16(o)(4)(iv) and 142.16(o)(4)(v) – Records of notices of state-specified monitoring and compliance requirements (when using membrane filtration or alternative treatment) needed to achieve at least 4-log treatment of viruses (using inactivation, removal, or a state-approved combination of 4-log inactivation and removal) before or at the first customer.	40 CFR 142.14(d)(17)(viii)
Sections 141.403(b)(1) and 141.403(b)(2) – Records of written notice from a GWS that provides at least 4-log treatment of viruses (using inactivation, removal, or a state-approved combination of 4-log inactivation and removal) before or at the first customer for a ground water source.	40 CFR 142.14(d)(17)(ix)
Section 142.16(o)(4)(vi) – Records of written determinations that a GWS may discontinue 4-log treatment of viruses (using inactivation, removal, or a state-approved combination of 4-log inactivation and removal).	40 CFR 142.14(d)(17)(x)

1.3.3 State Reporting Requirements [40 CFR 142.15(c)(7)]

Under 40 CFR 142.15, EPA currently requires states to report to EPA information such as violations, variance and exemption status, and enforcement actions. Table 1-6 describes the additional reporting requirements for states under the GWR. Section 5 of this guidance manual provides information on SDWIS reporting for the GWR.

Table 1-6. State Requirements for Reporting to EPA

State Requirements for Reporting to EPA	Rule Cite
For sanitary surveys: The month and year in which the most recent sanitary survey was completed or, for a state that uses a phased review process, the date the last element of the applicable eight elements was evaluated under 40 CFR 142.16(o)(2) for each GWS.	40 CFR 142.15(c)(7)(i)
For corrective action requirements: For any corrective action taken under 40 CFR 141.403(a), the date the GWS completed corrective action.	40 CFR 142.15(c)(7)(ii)
For compliance monitoring: All GWSs providing at least 4-log treatment of viruses (using inactivation, removal, or a state-approved combination of 4-log virus inactivation and removal) before or at the first customer for any ground water source(s).	40 CFR 142.15(c)(7)(iii)

1.4 Summary of Requirements

1.4.1 Applicability and Compliance Dates

The GWR addresses fecal contamination in systems that use ground water sources. The rule applies to both CWSs and NCWSs, regardless of size. The GWR applies to all PWSs that:

- Rely entirely on one or more ground water sources;
- Are consecutive systems that receive finished ground water; or,
- Mix surface and ground water, where ground water is added directly to the distribution system and provided to consumers without treatment equivalent to the treatment provided for surface water.

The GWR does not apply, however, to PWSs that combine all of their ground water with surface water before the treatment required for surface water systems is applied.

The GWR requires GWSs that provide at least 4-log treatment of viruses using chemical disinfection, membrane filtration, or a state-approved alternative treatment technology to provide written notification that demonstrates the treatment effectiveness, no later than December 1, 2009, in order for the systems to not be required to conduct triggered source water monitoring. These systems must also begin compliance monitoring by December 1, 2009. The written notification must include engineering, operational and other information requested by the state so that the state can evaluate the submission.

More information can be obtained from:
A. The GWR published on November 8, 2006 (71 FR 65574 and available at:
www.epa.gov/fedrgstr/EPA-WATER/2006/November/Day-08/w8763.pdf
and a rule correction published on November 21, 2006 (71 FR 67427) and available at:
www.epa.gov/fedrgstr/EPA-WATER/2006/November/Day-21/w8763.pdf

B. The EPA Safe Drinking Water Hotline, Telephone: (800) 426-4791

This rule contains no early implementation requirements. The timetable for the GWR is presented in Table 1-7 summarizes key compliance dates required (bold) by the GWR as well as suggested action dates (shaded).

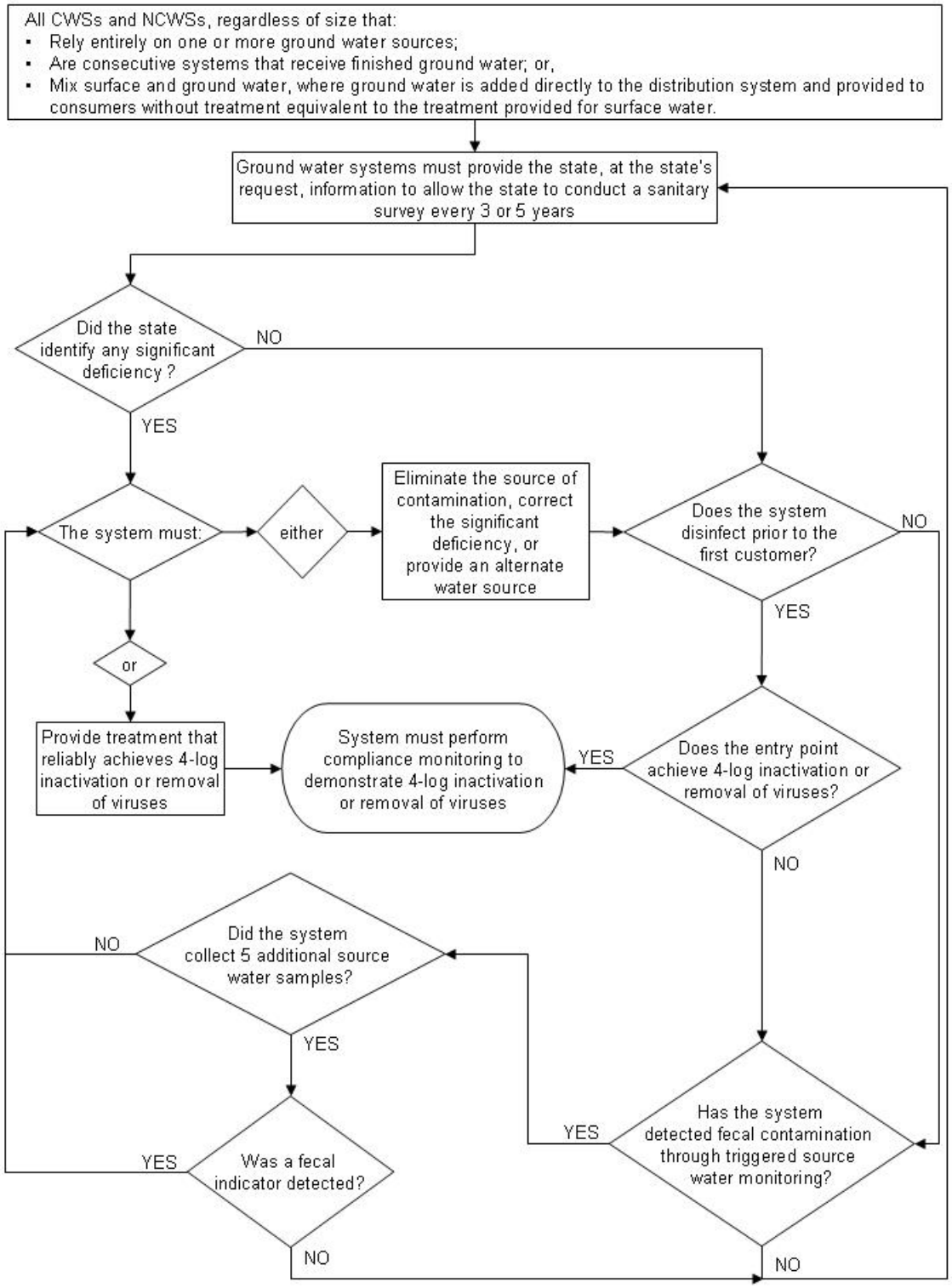
Table 1-7. Summary of Action Dates for the Ground Water Rule

Key Dates of Rule	GWR Requirements
November 8, 2006	GWR published in *Federal Register*
November 21, 2006	GWR correction published in *Federal Register*
November 22, 2006	GWR promulgated
August 8, 2008	States are encouraged to submit final primacy applications or extension requests to EPA.

Key Dates of Rule	GWR Requirements
November 8, 2008	**Final primacy revision applications for GWR must be submitted to the EPA regional administrator, unless state is granted an extension.**
November 30, 2009	**New ground water sources put in place after this date must meet triggered source water monitoring requirements or provide 4-log treatment of viruses.**
December 1, 2009	**GWR compliance date - all GWSs must comply.** • **GWSs for which the state has identified a significant deficiency (during a sanitary survey) and GWSs at which at least one of the five additional ground water source samples (or at state discretion, the initial source sample) has tested positive for fecal contamination must comply with the treatment technique requirements.** • **GWSs must conduct triggered source water monitoring if the system does not provide at least 4-log virus inactivation, removal, or a state-approved combination of these technologies before or at the first customer and the system is notified that a sample collected for the TCR is total coliform-positive.** • **GWSs providing at least 4-log virus inactivation, removal, or a state-approved combination of these technologies before or at the first customer must notify the state in writing of the effectiveness and reliability of the treatment and begin compliance monitoring in order not to have to comply with the triggered source water monitoring requirements. The written notification must include engineering, operational, and other information the state requests.**
August 8, 2010	States with approved extension agreements are encouraged to submit final primacy applications to EPA.
November 8, 2010	**Final primacy applications must be submitted to the EPA regional administrator for systems with a full 2 year extension. [40 CFR 142.12(b)(1)]**
December 31, 2012	**State must complete first round of sanitary surveys for CWSs (with the exception, if the state decides, of CWSs that provide at least 4-log treatment of viruses—using inactivation, removal, or a state-approved combination of 4-log inactivation and removal—before or at the first customer for all its ground water sources or CWSs that the state has determined have an outstanding performance record).**
December 31, 2014	**State must complete first round of sanitary surveys for NCWSs and any CWSs that have qualified to have surveys conducted at a frequency of once every 5 years.**

The following flowchart depicts the general requirements of the rule for all systems (Figure 1.1). Additional rule flowcharts are in Appendix D of this guidance manual.

Figure 1-1. Ground Water Rule Requirements



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Section 2

Resources and Guidance

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In addition to this Implementation Guidance Manual, a variety of resource materials and technical guidance documents have been prepared by EPA to facilitate understanding and implementing the GWR. This section is an overview of each of these resources and includes instructions on how to obtain the documents.

2.1 Technical Guidance Manuals

The following six technical guidance manuals have been or are being developed to support the GWR. These manuals will aid EPA, state agencies, and affected PWSs in implementing this rule and will help ensure that the implementation among these groups is consistent.

- *Ground Water Rule Source Assessment Guidance Manual*. 815-R-07-023, July 2008. The objective of this guidance manual is to provide states, tribes, and other primacy agencies with a brief review of hydrogeologic sensitivity assessments, an overview of the characteristics of a sensitive aquifer, information about how source water assessments may be used, and how to determine if a sensitive aquifer has a hydrogeologic barrier. Available at www.epa.gov/safewater/disinfection/gwr/compliancehelp.html.

- *Ground Water Rule Source Water Monitoring Guidance*. EPA 815-R-07-019. Rev. March 2007. The objective of this guidance document is to provide ground water systems, states, tribes, and other primacy agencies with a brief review of the source water monitoring provisions. Since the primacy agencies may select one of three fecal indicators (e.g., *E. coli*, enterococci, coliphage) that the system would be required to test for in the ground water source sample, the source water monitoring guidance manual provides criteria to assist primacy agencies in their determination of which fecal indicator is most appropriate. EPA revised this guidance document in March 2008 to clarify text describing the analytical methods approved for use for source water monitoring under the GWR. Available at www.epa.gov/safewater/disinfection/gwr/compliancehelp.html.

- *Complying with the Ground Water Rule: Small Entity Compliance Guide One of the Simple Tools for Effective Performance (STEP) Guide Series*. EPA 815-R-07-018. July 2007. This guidance document is intended to be an official compliance guide to the GWR for small public water systems, as required by the Small Business Regulatory Enforcement Fairness Act of 1996. This guide contains a general introduction and background for the GWR, describes the specific requirements of the GWR and provides information on how to comply with those requirements. Available at www.epa.gov/safewater/disinfection/gwr/compliancehelp.html.

- *Consecutive System Guide for the Ground Water Rule*. EPA 815-R-07-020. July 2007. The consecutive system guidance manual describes the regulatory requirements of the GWR as it applies to wholesale GWSs and to the consecutive GWSs that receive and distribute that ground water supply. Available at www.epa.gov/safewater/disinfection/gwr/compliancehelp.html.

- *Ground Water Rule Corrective Action Guidance Manual*. 815-R-08-011, November 2008. The objective of the corrective action guidance manual is to provide states, tribes, other primacy agencies and ground water systems with an overview of the treatment technique requirements of the GWR. The guidance manual will provide assistance with determining the information that should be included in a systems corrective action plan. Available at www.epa.gov/safewater/disinfection/gwr/compliancehelp.html.

- *Sanitary Survey Guidance Manual for Ground Water Systems*. 815-R-08-015, October 2008. The objective of the sanitary survey guidance manual is to provide states, tribes, and other primacy agencies with a brief review of the sanitary survey regulatory provisions, give specific examples of what may constitute a significant deficiency, and provide a checklist of elements that should be evaluated during the course of a sanitary survey inspection. Available at www.epa.gov/safewater/disinfection/gwr/compliancehelp.html.

In addition to the technical guidance manuals developed to support the GWR, EPA has developed other guidance manuals that may help primacy agencies and affected PWSs with implementing the GWR.

- G*uidance Manual for Conducting Sanitary Surveys of Public Water Systems; Surface Water and Ground Water Under the Direct Influence (GWUDI)*. EPA 815-R-99-016. April 1999. Available at www.epa.gov/safewater/mdbp/implement.html.

- *Guidance Manual for Compliance with the Filtration and Disinfection Requirements for Public Water Systems Using Surface Water Sources*. March 1991. Available at www.epa.gov/safewater/mdbp/implement.html.

- *Alternative Disinfectants and Oxidants Guidance Manual*. EPA 815-R-99-014. April 1999. Available at www.epa.gov/safewater/mdbp/implement.html.

- *Disinfection Profiling and Benchmarking Guidance Manual*. EPA-815-R-99-013. August 1999. Available at www.epa.gov/safewater/mdbp/implement.html.

- Disinfection profile/CT spreadsheet. April 2001. Available at www.epa.gov/safewater/mdbp/implement.html.

- *Revised Public Notification Handbook*. EPA 816-R-07-003. March 2007. Available at www.epa.gov/safewater/publicnotification/compliancehelp.html.

- *Revised State Implementation Guidance for the Consumer Confidence Report (CCR) Rule*. EPA 816-R-01-002. January 2001. Available at www.epa.gov/safewater/ccr/compliancehelp.html.

- *Preparing Your Drinking Water Consumer Confidence Report Revised Guidance for Water Suppliers*. EPA 816-R-05-002. April 2005. Available at www.epa.gov/safewater/ccr/compliancehelp.html.

- *Manual for the Certification of Laboratories Analyzing Drinking Water*. 5th ed. EPA 815-R-05-004. January 2005. Available at www.epa.gov/safewater/methods/laboratorycertification.html.

- *Simultaneous Compliance Guidance Manual For The Long Term 2 And Stage 2 DBP Rules*. EPA 815-R-07-017. March 2007. Available at www.epa.gov/safewater/disinfection/lt2/compliance.html.

- *Ultraviolet Disinfection Guidance Manual for the Final Long Term 2 Enhanced Surface Water Treatment Rule*. EPA 815-R-06-007. November 2006. Available at www.epa.gov/safewater/disinfection/lt2/compliance.html.

- *Membrane Filtration Guidance Manual: Overview and Summary*. Available at www.epa.gov/safewater/disinfection/lt2/compliance.html.

- *Membrane Filtration Guidance Manual*. EPA 815-R-06-009. November 2005. Available at www.epa.gov/safewater/disinfection/lt2/compliance.html.

For more information, contact EPA's Safe Drinking Water Hotline at (800) 426-4791, or see the Office of Ground Water and Drinking Water Web site. The GWR and guidance documents are located at www.epa.gov/safewater/disinfection/gwr.

2.2 Rule Presentation

Presentations that can be used for workshops on the GWR will be available in PowerPoint format on EPA's Web site: www.epa.gov/safewater/disinfection/gwr/compliancehelp.html.

2.3 Fact Sheet and Quick Reference Guide

Factsheets and Quick Reference Guides for the GWR may be useful for conveying basic information about the rule to water systems, new personnel, and stakeholders. These stand alone documents are included in Appendix C of this guidance manual. They are:

- Ground Water Rule Factsheet:
  - General Rule Requirements. EPA 816-F-08-028. June 2008.
  - Monitoring Requirements. EPA 816-F-08-025. June 2008.
  - Sanitary Surveys. EPA 816-F-08-027. June 2008.
  - Public Notification, Consumer Confidence Report, and Special Notice Requirements for Community Water Systems. EPA 816-F-08-026. June 2008.
  - Public Notification and Special Notice Requirements for Noncommunity Water Systems. EPA 816-F-08-030. June 2008.
- Ground Water Rule: A Quick Reference Guide. EPA 816-F-08-029. June 2008.
- Ground Water Rule Triggered and Representative Monitoring: A Quick Reference Guide. EPA 815-F-08-004. July 2008.
- Ground Water Rule Compliance Monitoring: A Quick Reference Guide. EPA 815-F-08-008. July 2008.
- Ground Water Rule Sample Collection and Transport: A Quick Reference Guide. EPA 815-F-08-007. July 2008.
- Total Coliform Rule: A Quick Reference Guide. EPA 816-F-01-035. November 2001.

2.4 Questions & Answers

Questions and Answers (Q&As) on the GWR will be provided in this section. These questions have been asked of EPA through the Safe Drinking Water Hotline, implementation training, or other means.

PWS Questions

Background Information

Q1. What is the purpose of the Ground Water Rule (GWR)?

A1. The purpose of the GWR is to provide for increased protection against microbial pathogens, specifically viral and bacterial pathogens, in public ground water systems (GWSs). EPA is particularly concerned about GWSs that are susceptible to fecal contamination because these systems may be at risk of supplying water that contains harmful microbial pathogens.

Q2. To which public water systems (PWSs) does the GWR apply?

A2. The GWR applies to all public GWSs that use wells or other ground water sources except for PWSs that combine all of their ground water with surface water or with ground water under the direct influence (GWUDI) of surface water before the water is treated. Consecutive systems that receive finished ground water are also considered GWSs and must comply with the requirements of the GWR.

Q3. When do GWSs need to comply with the requirements of the GWR?

A3. As of December 1, 2009, GWSs will be required to comply with the applicable GWR requirements for:

- Triggered source water monitoring.
- Assessment monitoring (if required by the State).
- Compliance monitoring.
- Corrective actions.

If a GWS does not know by December 1, 2009, whether it provides 4-log inactivation and/or removal of viruses, the GWS should inform the state in writing that it is not certain whether it provides 4-log inactivation or removal of viruses, and provide information to the state that would help determine if it provides enough treatment to reliably achieve 4-log inactivation or removal. In the meantime, until it is determined whether or not the GWS provides adequate treatment and the GWS begins compliance monitoring, the GWS should conduct triggered source water monitoring in response to any routine Total Coliform Rule (TCR) total coliform-positive samples.

Q4. What are the key provisions of the GWR?

A4. The key provisions of the GWR include:

- Periodic on-site reviews and inspections of GWSs and identification of significant deficiencies.
- Requirements to correct significant deficiencies and eliminate/treat fecal contamination through specified corrective actions.
- Source water monitoring to test for the presence of fecal indicator(s).
- Compliance monitoring to ensure that treatment technologies installed to treat drinking water reliably achieve at least 99.99 percent (4-log) inactivation or removal of viruses.

Q5. Where can a PWS find EPA resources on the GWR?

A5. Information can be found online at: www.epa.gov/safewater/disinfection/gwr/. These include factsheets, quick reference guides, and various guidance manuals.

Q6. How does the GWR apply to seasonal systems?

A6. All public GWSs that use wells or other ground water sources must monitor under the GWR [either in response to a TCR total coliform-positive result or daily as part of compliance monitoring] for each day that they provide ground water to the public.

Q7. What is the relationship between the GWR and the TCR?

A7. The TCR and GWR work together. The GWR builds on the TCR by addressing the health risks of fecal contamination in GWSs. The GWR builds on the public health protection provided by the TCR by requiring systems to collect a ground water source sample for each routine distribution system sample taken under the TCR that is total coliform-positive. Because a total coliform-positive sample in the distribution system may be caused by either a distribution system problem or source water contamination, the GWR triggered source water monitoring provision is necessary to distinguish between these two possible causes of contamination.

Monitoring

Q8. What is the difference between *E. coli* and fecal coliforms in terms of monitoring?

A8. Fecal coliforms, also referred to as thermotolerant coliforms, are a subset of total coliform bacteria that are capable of growth and lactose fermentation at elevated incubation temperatures (44.5°C). The fecal coliform group consists mostly of *E. coli,* however some other environmental coliform strains, such as *Klebsiella* and *Citrobactor*, have also been found to be capable of growth at this elevated temperature and are thus included in the fecal coliform group. Therefore, in the fecal coliform group there may be environmental bacteria not typically associated with disease in humans. The occurrence of these environmental bacteria in this group has diminished correlation of this group with fecal contamination and *E. coli* has emerged as a more useful indicator of fecal contamination in public water supplies. *E. coli has been* included as a fecal indicator under the Ground Water Rule, while fecal coliforms are not used.

Q9. If a GWS is informed that it has a TCR total coliform-positive routine sample, but the TCR repeat samples are negative, does the system still monitor the source water for a fecal indicator even though the TCR total coliform-positive repeats are negative?

A9. Yes, the GWR requires the system to collect triggered source water sample(s) within 24 hours of learning of a total coliform-positive routine TCR sample result. The TCR repeat samples have no bearing on whether triggered source water monitoring is required under the GWR.

Q10. If a system provides 4-log treatment and is conducting compliance monitoring and it has a total coliform-positive result, does it have to do triggered source water monitoring?

A10. No. Systems approved for and conducting compliance monitoring do not need to meet the GWR triggered source water monitoring requirements.

Q11. If a GWS provides 4-log treatment and decides to be subject to triggered source water monitoring rather than compliance monitoring, does the system get a violation if it does not do compliance monitoring?

A11. Not under the GWR, unless the GWS is providing 4-log treatment as part of a corrective action. Otherwise, under the GWR a GWS has the discretion to choose to be subject to triggered source water monitoring rather than conduct compliance monitoring. If a GWS opts to be subject to triggered source water monitoring rather than compliance monitoring, the GWS is not required to notify the state that it provides 4-log treatment of viruses. States may, however, have additional notification and compliance monitoring requirements than those in the GWR.

Q12. Is the minimum disinfection residual concentration for GWSs conducting compliance monitoring set on a system-by-system basis or is there one level for all the systems?

A12. States have the discretion to set one level for all systems, but EPA recommends states set a minimum disinfectant residual for each system since achieving virus inactivation depends so much on contact time, which varies by system and by source (even within systems). EPA has developed a tool to help water systems determine their disinfection contact time that is available on EPA's website at www.epa.gov/safewater/disinfection/index.html.

Q13. What are the requirements before a system can bring a new source on-line?

A13. New sources are subject to triggered source water monitoring unless the system will provide 4-log treatment of the water from the source and will conduct compliance monitoring. If a GWS will be conducting compliance monitoring, the GWR requires compliance monitoring to begin within 30 days of the source coming on-line. Otherwise, water from the source is subject immediately to the triggered source water monitoring requirements. States may require source water monitoring prior to a source coming on-line.

Consecutive/Wholesale Systems

Q14. What does a consecutive system (not providing 4-log treatment and not conducting compliance monitoring) have to do in response to a TCR total coliform-positive result?

A14. In addition to the existing requirements for follow-up under the TCR, the consecutive system must notify all wholesale system(s) within 24 hours of being notified of the total coliform-positive sample.

EPA has not developed a prescribed method for GWSs to inform consecutive or wholesale systems of a positive sample(s) taken under the TCR or GWR. EPA suggests that the systems contact one another as soon as possible after a positive result. While registered mail is not likely to be an effective way to reach the wholesale or consecutive system within the required 24-hour timeframe, written follow-up by mail might be a good idea. GWSs are encouraged to establish a communication protocol prior to December 1, 2009 so that if notification becomes necessary, a plan is in place. EPA has developed the *Consecutive System Guide for the Ground Water Rule* that provides some ideas on how to communicate with the wholesale system.

Q15. What does a wholesale ground water system (not providing 4-log treatment or conducting compliance monitoring under the GWR) have to do in response to a notice from a consecutive system that it had a TCR total coliform-positive sample?

A15. If a wholesale GWS receives notice from a consecutive system it serves that a sample the consecutive system took under the TCR is total coliform-positive, the wholesale GWS must conduct triggered source water monitoring. The wholesale system must collect a sample from the ground water source(s) serving the consecutive system and analyze the source water sample(s) for a fecal indicator within 24 hours of being notified by the consecutive system. If the triggered source water sample is positive for the fecal indicator, the wholesale system must notify all consecutive systems served by that source within 24 hours of the positive sample result. The wholesale system and any consecutive systems served by the fecal indicator-positive source must all notify their consumers within 24 hours of learning of the result. If the state does not require corrective action for this fecal indicator-positive sample, the wholesale system must collect five additional source water samples from the same source within 24 hours of receiving notification of the fecal indicator-positive sample.

<u>State Questions Regarding the GWR</u>

Q16. How does a state set the minimum residual for a system conducting compliance monitoring? Are there options?

A16. There are options. States must describe how they will make this determination in their primacy package. States should set a minimum residual level that accounts for variable contact times and/or baffling factors at the water systems. States may also consider setting a variable minimum residual level to allow for changes in contact time (CT) (such as seasonal changes in water flow). CT tables have been developed by EPA and are included in Section 4 of the *Ground Water Rule Implementation Guidance Manual*.

Q17. If a state is requiring all systems to provide 4-log virus treatment and conduct compliance monitoring, does a system need to provide notification to the state that it provides 4-log treatment and will be conducting compliance monitoring?

A17. Yes. Under the federal recordkeeping requirements states are required to keep the notice from the system saying that it provides 4-log treatment and is conducting compliance monitoring [40 CFR 142.14(d)(17)(ix)]. An example form that GWSs could use to notify their state that they provide 4-log treatment of viruses is provided in Section 3 of the *Ground Water Rule Implementation Guidance Manual*. States may want to recommend to systems that they check with their state to learn what options they have to satisfy this requirement.

Q18. For corrective actions, can the state select a mix and match of the 4 options?

A18. Yes, states have that discretion. The state may allow systems to do one or more of the following:

- Correct all significant deficiencies
- Provide an alternate source of water
- Eliminate the source of contamination
- Provide treatment that reliably achieves 99.99 percent (4-log) inactivation and/or removal of viruses.

Q19. In response to a fecal indicator-positive triggered source water monitoring sample, are states going to uniformly require additional monitoring, uniformly require all systems to go directly to corrective action, or decide on a case-by-case basis?

A19. This depends on each state. Some states are planning on universal additional monitoring and others are planning on requiring corrective action immediately in response to any fecal indicator positive source water sample.

Q20. Can a state allow a system to skip triggered source water monitoring and go directly to corrective action?

A20. No. If a GWS is not already providing 4-log treatment and conducting compliance monitoring, triggered source water sample(s) must be collected in response to a total coliform-positive routine TCR sample, unless the TCR sample meets one of the two triggered monitoring exceptions described in the GWR. Triggered source water samples must be collected regardless of whether or not the GWS will take corrective action.

Q21. Can the state's primacy application be written in a way to provide standing criteria that the state can use to extend the 24-hour time period for triggered source water monitoring so that the state doesn't have to do it on a case-by-case basis?

A21. Yes. In addition, states and GWSs can include it as part of a rural/isolated system's approved monitoring plan. This is consistent with how states addressed this issue in their TCR primacy packages.

Q22. Does assessment source water monitoring have any related federal monitoring or treatment technique requirements?

A22. No. Assessment source water monitoring allows for state discretion in determining what is needed to make the best decision regarding potential fecal contamination. However, if a

fecal indicator-positive source sample is found during assessment monitoring, the GWS will be required under the GWR to fulfill public notification requirements under 40 CFR 141.403(a)(7).

Q23. What is EPA's position on monitoring in unsafe conditions?

A23. Operators should not be sent out to sample in unsafe conditions. Monitoring requirements, however, should be extended but not waived. The state can provide systems with additional time (if needed) on a case-by-case basis.

Q24. How frequently are sanitary surveys required?

A24. Sanitary surveys must be conducted for every GWS regardless of its size or type. Each state must conduct a sanitary survey at community GWSs every 3 years and at community GWSs that either conduct compliance monitoring or have been deemed by the state to have outstanding performance every 5 years. Sanitary surveys of noncommunity GWSs must be conducted every 5 years. Initial sanitary surveys of community GWSs must be completed by December 31, 2012; initial surveys of community GWSs conducting compliance monitoring or deemed to have outstanding performance, as well as initial surveys of noncommunity GWSs, must be completed by December 31, 2014. States can refer to EPA's *Ground Water Rule Factsheet: Sanitary Surveys* for more information.

Q25. Is the deadline for sanitary surveys of community GWSs three years after the last one or is the deadline the end of the calendar year three years later?

A25. The deadline is three years after the last survey was completed. For example, if a sanitary survey was conducted in June 2010, the next one is due no later than May 31, 2013.

Q26. Can states use information from other programs, like source water protection and operator certification, to meet the sanitary survey requirements?

A26. Yes. States can use other programs' reviews and results to meet the requirements of the eight elements of the sanitary survey.

Q27. What information must be kept by the state for the sanitary survey requirements?

A27. For SDWIS, records of sanitary surveys include the month and year of the survey; in addition, the state should keep copies of the survey itself on file for 12 years [40 CFR 142.14(d)(1)].

Q28. If a state currently has 60 days to get the Sanitary Survey Report out to the system, can the state take 60 days to notify the system of its significant deficiency?

A28. No. The GWR gives states only 30 days to provide written notice of any significant deficiencies found during sanitary surveys. The state can, however, notify the system at the time of the survey by providing written documentation of the problem (such as a copy of the sanitary survey report noting the issue).

Q29. If, during a sanitary survey, the inspector finds a bad seal (but cracked slab is listed in the primacy package as a significant deficiency), is the state limited to the significant deficiency in the primacy package?

A29. It depends how the state handled it in its regulation. If possible, states should give themselves some flexibility when identifying significant deficiencies. One way for a state to do this is to preface a list of significant deficiencies with language such as "including but not limited to…". This would give the state some latitude to make a determination on a case-by-case basis, since foreseeing every possible significant deficiency is impossible. In their primacy packages, states have to provide only one example of a significant deficiency for each of the eight elements of the sanitary survey.

Q30. Does the state have to describe in its primacy package what it will require for special notice, particularly for NCWSs?

A30. No. The state can determine what is most appropriate on a case-by-case basis.

Section 3

State Implementation

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3.1 Overview of Implementation

Ground Water Systems (GWSs) are required to take specific actions to comply with the Ground Water Rule (GWR). Primacy agencies should clearly define the monitoring, reporting, performance, and follow-up requirements of the GWR to help systems understand how the rule will affect them and what they must do to comply. To meet this goal, primacy agencies are expected to carry out numerous implementation activities, including:

- Identifying affected systems by the rule requirements.
- Communicating requirements to the affected systems.
- Updating data management systems.
- Performing sanitary surveys at prescribed intervals for community water systems (CWSs) and noncommunity water systems (NCWSs).
- Notifying systems of significant deficiencies or source water fecal contamination in a timely manner and explaining the schedule and steps a system should follow in response.
- Tracking regulated system compliance progress and implementing enforcement action as needed.
- Determining which fecal indicators the state will allow to be used to meet source water monitoring requirements.
- Having the authority to designate an appropriate fecal indicator for use in identifying fecal contamination after a positive total coliform sample under triggered monitoring or optional assessment monitoring provisions.
- Determining which systems will be required to conduct source water assessment monitoring.
- Directing systems to conduct assessment source water monitoring, in accordance with state-determined requirements for such monitoring.
- Consulting with systems regarding any system changes.

This section discusses each of these items. To help state implementation efforts, Sections 3 and 4 of this guidance manual offer suggestions and alternatives that go beyond the minimum primacy agency requirements specified in the subsections of 40 CFR 142.16. Such suggestions are prefaced by “may” or “should” and are to be considered advisory. They are not required elements of state applications for program revision.

3.2 Identify Affected Systems

Different provisions of the GWR apply to different types (i.e., CWS, NCWS) and sizes of GWSs. In addition, some requirements have different compliance deadlines based on system type. This section discusses which different GWSs are affected by the various provisions of the GWR.

3.2.1 General Provisions [40 CFR 141.400(b)]

The GWR applies to public water systems (PWSs) that use ground water, except for PWSs that combine all of their ground water with surface water or with ground water under the direct influence of surface water (GWUDI) (Subpart H systems) before the water is treated. These systems must comply instead with requirements for surface water systems. Consecutive systems that receive finished ground water are also considered GWSs and must comply with the requirements of the GWR. States may wish to query or sort their databases or other inventory information to list all PWSs that use ground water (and do not combine it with surface water or GWUDI of surface water before treatment).

Mixed Systems

As mentioned, systems using both surface water and ground water, often referred to as "mixed systems," may have to comply with GWR requirements. If a PWS does not combine all its ground water with surface water and treat all of that water according to the treatment requirements for surface water systems, the system will have to comply with the requirements of the GWR. For example, if a PWS has a ground water supply that enters the distribution system at a different entry point than the entry point where its surface water is entering the distribution system, the PWS will have to comply with GWR requirements. As another example, if a PWS' surface water and ground water supplies enter the distribution system via a common entry point but some or all of the ground water by-passes the surface water treatment plant, the system has to comply with the GWR. Those systems that use ground water sources seasonally (and do not treat all of the ground water as if it were a surface water supply) have to comply with GWR requirements while the ground water source is in use. Finally, systems that purchase water and have their own source have to comply with GWR requirements if any of its water sources is ground water, and that ground water is not treated according to the treatment requirements for surface water systems.

3.2.2 Sanitary Surveys [40 CFR 142.16(o)(2)(i)]

The GWR has minimum primacy requirements that apply to states for the frequency and content of sanitary surveys of CWSs and NCWSs. Since these are minimum requirements, the state may conduct more frequent sanitary surveys for any system, and may choose not to limit their sanitary surveys to the general requirements that are provided in 40 CFR 142.16(o)(2). Note that compliance with the Total Coliform Rule (TCR) sanitary survey requirements may not meet the revised scope and frequency of sanitary survey requirements stated here.

Community GWSs

States are required to conduct sanitary surveys of community GWSs at least once every 3 years unless either of the following conditions applies:

- The GWS provides at least 4-log treatment of viruses (using inactivation, removal, or a state-approved combination of 4-log inactivation and removal) before or at the first user for all its ground water sources and conducts state required monitoring to ensure continuous compliance.

- The GWS has an outstanding performance record, as determined by the state and documented in previous sanitary surveys and has no history of total coliform maximum contaminant level (MCL) or monitoring violations under the TCR since the last sanitary survey.

If either of these conditions applies, the state may conduct a sanitary survey of the community GWS once every 5 years instead of once every 3 years.

The state must conduct the first sanitary survey, to meet the revised sanitary survey scope, for all community GWSs by December 31, 2012, unless the system has been put on a survey schedule of once every 5 years, as described above. For such systems, the state must complete all of the first sanitary surveys by December 31, 2014.

Noncommunity GWSs

States are required to conduct sanitary surveys of noncommunity GWSs at least once every 5 years. The GWR does not allow additional time between surveys based on whether the NCWS has treatment in place or has demonstrated outstanding performance. The state must conduct the first sanitary surveys, to meet the revised sanitary survey scope, for all NCWSs by December 31, 2014.

3.2.3 Triggered Source Water Monitoring [40 CFR 141.402(a)]

Triggered source water monitoring is required for all GWSs that do not provide at least 4-log treatment of viruses (using inactivation, removal, or a state-approved combination of 4-log virus inactivation and removal) before or at the first customer for each ground water source and are not conducting compliance monitoring. Triggered monitoring must be carried out if a system is notified that a sample the system collected for compliance with the TCR is total-coliform positive.

Consecutive and Wholesale Systems

The GWR has additional triggered source water monitoring requirements that apply to consecutive systems and their wholesale GWSs. If a consecutive system is notified that a sample it collected for compliance with the TCR is total-coliform positive, that consecutive system is required to notify its wholesale system of the positive sample. The wholesale system is then required to perform triggered source water monitoring, as described above. If a triggered source water sample collected by the wholesale system is positive for a fecal indicator, the wholesale system must notify all consecutive systems served by that ground water source of the fecal indicator source water positive result. For more information and guidance on the GWR requirements for consecutive systems, refer to EPA's *Consecutive System Guide for the Ground Water Rule* (EPA 815-R-07-020, July 2007) available at www.epa.gov/safewater/disinfection/gwr/pdfs/guide_gwr_consecutive-guidance.pdf. GWSs must comply with the triggered source water monitoring requirement beginning December 1, 2009.

3.2.4 Treatment Technique Requirements [40 CFR 141.403(a)]

The GWR treatment technique requirements apply to all GWSs when a significant deficiency is identified or when a source water sample indicates that a ground water source is fecal indicator-positive. The GWR requires these systems to consult with the state within 30 days of receiving written notice of the significant deficiency or written notice of the fecal indicator-positive result. It is important that the state and the system communicate effectively during this time period. An open, active channel of communication improves the likelihood of developing a mutually acceptable corrective action schedule and informed, timely responses from the state to questions the system may have.

3.2.5 Compliance Monitoring [40 CFR 141.403(b)]

The GWR's compliance monitoring requirements apply to all community and noncommunity GWSs that provide at least 4-log treatment of viruses (using inactivation, removal, or a state-approved combination of 4-log virus inactivation and removal) before or at the first customer for each ground water source. Existing GWSs must notify the state if they provide 4-log treatment of viruses and begin compliance monitoring by December 1, 2009. New ground water sources placed in service after November 30, 2009, that provide at least 4-log virus treatment must begin compliance monitoring within 30 days of placing the source in service.

Many GWSs have not documented or do not know if they provide 4-log treatment of viruses. Those systems should notify the state that they provide treatment and submit supporting information, but they should conduct triggered source water monitoring until the state has accepted information confirming that the system provides 4-log treatment of viruses. States may want to require systems to submit information about the extent of baffling in their tanks or clearwells, depending on whether this is a factor in the state's approach to determining how much disinfection is being provided. An example of a letter and form that states could use to help treated GWSs submit the necessary information to meet this reporting requirement is provided in Example 3-1.

Example 3-1. Example State Correspondence and Form for GWSs to Notify State if they Provide 4-log Treatment of Viruses

State Letterhead

Steven Smith, Director
Aquifer Water Company, PWSID XXXXXXX
Anywhere, USA
RE: Ground water treatment notification

Dear Mr. Smith:

The Ground Water Rule was published on November 8, 2006, to provide increased protection against pathogens in public water systems that use ground water sources. One requirement of the rule is that public water systems using ground water as their source must notify the state if they are currently providing 4-log treatment of viruses. This treatment can be achieved using inactivation (disinfection), removal (filtration), or a combination of inactivation and removal that has been approved by the state. If you are one of these systems, you are required to notify us by December 1, 2009.

We have included a form with this letter to help you comply with this requirement. If you have more than one ground water source, make copies of the form before filling it out and submit one completed copy for each source. Please complete a copy of the form for each ground water source your utility uses.

An explanation of what constitutes 4-log treatment of viruses is provided on the form. If you are not sure how to determine how much virus treatment your system has, call us at (555) 555-1234 and we will help you make that determination. If you understand how to make the determination but do not have the necessary information, check the box that says "We do not know if our ground water system provides 4-log treatment of viruses." A representative from our office will call you and advise you how to proceed.

Completed forms should be mailed to us at the address provided on the form. We appreciate your prompt attention and reply.

Sincerely,

Your Regulator

PWSID Number: _____

System Name: _____

Contact Person and Phone Number: _____

Does Your System Provide 4-log Treatment of Viruses?

If your system disinfects with gaseous or liquid chlorine, use the table below to determine the CT that is provided for your ground water. The CT required will depend on your ground water source's temperature and the free chlorine residual concentration in your water at the first user. "CT" is an abbreviation for chlorine Concentration multiplied by Time.

To calculate your system's CT, multiply the free chlorine residual (in mg/L) at your first user's service connection by the shortest amount of time (in minutes) water comes into contact with the chlorine.

1. System's free chlorine residual (in mg/L) at first user's service connection: _____ X
2. Shortest amount of time (in minutes) water is coming into contact with the chlorine: _____ =
3. Multiply number and enter result: _____ Min-mg/L (Total CT)
4. System's ground water source's coldest water temperature: _____ In Degrees C

On Line A in the table below circle the value that most closely relates to the temperature recorded on line 4 above.
On Line B in the table circle the 4-log inactivation value that is associated with the temperature you circled on line A.
Compare your CT value from Line 3 above with the value you circled in Line B of the table below. If your CT is a number larger than the number you circled in Line B, then your system probably provides at least 4-log treatment of viruses.

CT Values for Inactivation of Viruses by Free Chlorine, pH 6.0-9.0

A.	Degrees C	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
B.	4-log Inactivation	11.6	10.7	9.8	8.9	8.0	7.6	7.2	6.8	6.4	6.0	5.6	5.2	4.8	4.4	4.0	3.8	3.6	3.4	3.2	3.0

CT values provided in the tables are modified by linear interpolation between 5°C increments.

If your system uses a different kind of disinfection (e.g., UV, ozone, chloramines) and/or filters its ground water, call Susan Jones at the Green County Health Department at (555) 555-1234. She will work with you to determine how many logs of virus treatment your system provides.

Check the line below that applies to your ground water system:

_____ **Our ground water system probably does not provide 4-log treatment of viruses**

_____ **Our ground water system probably provides 4-log treatment of viruses**

We do not know if our ground water system provides 4-log treatment of viruses

The following is an example calculation:

1. System's free chlorine residual (in mg/L) at first user's service connection: 0.5 mg/L X
2. Shortest amount of time (in minutes) water is coming into contact with the chlorine: 10 minutes =
3. Multiply number and enter result: (0.5 X 10) = 5 Min-mg/L (Total CT)
4. System's ground water source's coldest water temperature: 10 In Degrees C

On Line A in the table below circle the value that most closely relates to the temperature recorded on line 4 above. On Line B in the table circle the 4-log inactivation value that is associated with the temperature you circled on line A. Compare your CT value from Line 3 above with the value you circled in Line B of the table below. If your CT is a number larger than the number you circled in Line B then your system probably provides at least 4-log treatment of viruses.

This system does not achieve 4-log inactivation of viruses because the value from Line 3 (CT = 5) is smaller than the value circled on Line B (CT for 10°C = 6).

CT Values for Inactivation of Viruses by Free Chlorine, pH 6.0-9.0

A.	Degrees C	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
B.	4-log Inactivation	11.6	10.7	9.8	8.9	8.0	7.6	7.2	6.8	6.4	6.0	5.6	5.2	4.8	4.4	4.0	3.8	3.6	3.4	3.2	3.0

CT values provided in the tables are modified by linear interpolation between 5°C increments.

Please complete this form and mail it to

Susan Jones
Drinking Water Agency
123 Main Street
Anywhere, USA

Note: The CT values provided in this example address water with pH values between 6 and 9. Section 4.4.7.1 provides additional CT values for water with a pH of 10.

GWSs Serving More Than 3,300 People

GWSs serving more than 3,300 people conducting compliance monitoring must monitor the residual disinfectant concentration continuously, record the lowest daily residual disinfectant concentration, and maintain the state-determined minimum disinfectant residual concentration for each day the water is served to the public. If the continuous monitoring equipment fails, the system must collect grab samples every 4 hours until the continuous monitoring equipment is returned to service. Continuous monitoring must be resumed within 14 days.

GWSs Serving 3,300 or Fewer People

Systems serving 3,300 or fewer people conducting compliance monitoring are required to monitor and record, during peak hourly flow or another time designated by the state, the residual disinfectant concentration daily for each day that water from the ground water source is served to the public. If the

disinfectant residual falls below the state-determined minimum concentration, the system must collect follow-up samples every 4 hours until the minimum residual disinfectant concentration has been reached.

GWSs Using Membrane Filtration

Systems using membrane filtration for 4-log treatment of viruses must monitor the membrane filtration process according to state-specified monitoring requirements and must operate the membrane filtration according to all state-specified compliance requirements.

GWSs Using Alternative Treatment Technologies

Systems may use alternative treatment technologies (e.g., ultraviolet [UV] radiation) approved by the state, if the alternative treatment technology, alone or in combination (e.g., filtration with UV, filtration with chlorination) can reliably provide at least 4-log treatment of viruses. Systems must monitor the alternative treatment according to state-specified monitoring requirements, and must operate the alternative treatment according to compliance requirements established by the state.

3.2.6 Optional Assessment Source Water Monitoring [40 CFR 141.402(b)]

The GWR provides states with the option to require systems to conduct assessment source water monitoring at any time and require systems to take corrective action. EPA believes that this optional provision is an important tool for states that elect to require assessment source water monitoring on a case-by-case basis. EPA recommends that states require GWSs that are most susceptible to fecal contamination conduct assessment monitoring. States may use hydrogeologic sensitivity assessments (HSAs) as a tool to identify high risk systems for assessment source water monitoring. States also have other information available to them to target high risk systems, such as source water assessments, wellhead protection plans, and historical monitoring data. Previous data indicating source water fecal contamination, particularly from TCR monitoring, in combination with GWR triggered source water monitoring results, can be another important tool. The GWR suggests state-determined assessment source water monitoring requirements that might be appropriate. These are discussed in more detail in section 3.7.2.

3.3 Communicate GWR Requirements to Affected Systems

States should identify what actions they plan on taking and develop a schedule for carrying out those actions in order to implement the GWR in a timely and effective manner. One key step for states implementing the GWR should be communicating with those PWSs affected by the rule and preparing them to comply with the relevant provisions. Systems should be notified of new requirements early enough to ensure their ability to budget for and schedule their compliance actions. The more this is done, the more prepared states and systems will be as compliance dates approach.

This section provides guidance to states on notifying affected PWSs of GWR requirements. This guidance includes suggestions for organizing outreach efforts based on the provisions and compliance dates that apply to different categories of systems.

3.3.1 Requirements and Target Notification Time Frames

States often notify systems of upcoming requirements using a form letter that may or may not be tailored to some degree. Based on the GWR's provisions and different compliance schedules, states may find it useful to draft and send out different form letters to different categories of systems. States should consider

categorizing systems early on in their GWR communication efforts so that each system is provided only with the provisions and deadlines that apply to them.

Some system categories that may be effective for drafting form letters regarding the GWR are:

- CWSs.
- NCWSs.
- Wholesale systems serving ground water.
- Consecutive systems using ground water.
- GWSs serving more than 3,300 people that are likely to already provide at least 4-log treatment of viruses.
- GWSs serving 3,300 or fewer people that are likely to already provide at least 4-log treatment of viruses.
- Systems required by the state to conduct assessment source water monitoring.

Additional requirements specific to different categories of systems are provided in Table 3-1.

Table 3-1. GWR Requirements Applying To Different Categories of Water Systems

PWS Category	GWR Requirement
All GWSs	• Provide information to the state as needed for sanitary surveys. • Provide information requested by the state for conducting a hydrogeologic sensitivity assessment (except consecutive systems). • Conduct triggered source water monitoring if 4-log treatment is not in place (except consecutive systems). • Address significant deficiencies. • Address fecally contaminated source water (except consecutive systems). • Conduct compliance monitoring if a chemical disinfectant is being used and triggered source water monitoring requirements are not being met (except consecutive systems).
CWSs	• Participate in sanitary surveys every 3 years (or every 5 years under certain criteria). • Provide Special Notification of fecal contamination and any uncorrected significant deficiencies (requirements are specific to CWSs).[1]

PWS Category	GWR Requirement
NCWSs	• Participate in sanitary surveys every 5 years. • Provide Special Notification of any uncorrected significant deficiencies (requirements are specific to NCWSs).[1]
Consecutive Systems Using Ground Water	• If a sample collected in the consecutive system's distribution system for compliance with the TCR is total coliform-positive, the consecutive system is required to notify its wholesale system of the positive sample.
Wholesale GWSs	• If a sample collected in the distribution system of a consecutive system for compliance with the TCR is total coliform-positive, the wholesale system providing water to the consecutive system must collect a sample from its ground water source(s) and analyze it for a state-designated fecal indicator. • Notify consecutive systems within 24 hours of learning of fecal indicator-positive result.
GWSs Serving More than 3,300 People that Already Provide at Least 4-log Treatment of Viruses	• Notify state in writing that system provides 4-log treatment of viruses in order to conduct compliance monitoring instead of triggered source water monitoring. • To satisfy compliance monitoring requirements, continuously monitor residual disinfectant concentration at or before the first customer and record the lowest residual concentration every day that water from ground water source is served to public. • For alternative or membrane filtration systems, comply with state-specified monitoring requirements.
GWSs Serving 3,300 or Fewer People that Already Provide at Least 4-log Treatment of Viruses	• Notify the state in writing that system provides 4-log treatment of viruses in order to conduct compliance monitoring instead of triggered source water monitoring. • Monitor and record the residual disinfectant concentration, at time designated by the state, at or before the first customer every day that water from ground water source is served to public. • For alternative or membrane filtration systems, comply with state-specified monitoring requirements.
Systems Required by the State to Conduct Assessment Source Water Monitoring	• Meet state-determined requirements for assessment source water monitoring.

1. See section 3.8.3 for more information on special notice requirements for CWSs and NCWSs.

3.3.2 Methods of Communication

Written Notice

Providing written notice of rule requirements to GWSs serves two purposes: (1) the recipient system obtains a formal notice of upcoming regulatory requirements and a timeline for compliance, and (2) the primacy agency has a hard-copy document that it may file and use in subsequent compliance tracking efforts.

Written notification can be in the form of a letter from the state to affected systems. The letter should include a summary of rule requirements and timeframes and direct the reader to an appropriate contact if questions arise. States should consider including fact sheets or other summary materials with the letter.

Appendix C of this guidance includes additional publications that are intended to be distributed to water systems through mailings, training sessions, and other educational forums. These publications (also available at www.epa.gov/safewater/disinfection/gwr) provide overviews of the GWR to help systems understand the provisions of the rule and determine which provisions apply. They also describe the benefits of the rule. Although valuable, these resources do not substitute for official rule language. States should consider including in the letter the Web site address where their regulatory language can be accessed.

A sample letter is provided in Example 3-2. In this example, the letter is tailored to systems based on their compliance deadlines. As described earlier, states may wish to further tailor the letter to accommodate systems for which the provisions are either limited or unique. Note that some of the requirements listed in the letter (i.e., corrective action, testing for *E. coli*) may vary from state to state depending on which GWR options a state chooses to adopt in its regulation.

Slide Presentation

For some GWSs, written communication alone will not result in full comprehension of the GWR requirements. Slide presentations can be used by state staff and other training providers to present the background of the rule, its benefits, and its requirements.

The EPA's Drinking Water Academy is developing a training session on the GWR (available in Microsoft PowerPoint format). Copies of the presentation may be used to train other state personnel, technical assistance providers, water system personnel, and the public. EPA's Drinking Water Academy slides will be available electronically on the EPA Web site at www.epa.gov/safewater/dwa.html.

Guidance Documents

Technical guidance documents developed for the GWR are useful for explaining rule requirements and specific aspects of rule implementation to system operators, including monitoring and compliance determination. The guidance documents can be used as stand-alone references or as supporting materials in GWR training events. See Section 2 for more information on these references.

Example 3-2. Example System Notification Letter

State Letterhead

John Smith, Supt.
Town Water System, PWSID XXXXXXX
Town, ST 12345
RE: Ground Water Rule

Dear Mr. Smith:

This letter is to notify you that your public water system (PWS) will be affected by the Ground Water Rule (GWR). The GWR applies to all PWSs that use ground water as their source of water and do not combine their ground water with surface water prior to treatment. The requirements of the GWR will take effect December 1, 2009. You are receiving this letter because our data show your system is a PWS that uses ground water.

Our records show that you do not treat your ground water source before the water is delivered to your customers. Our records also show that your system is a community water system serving 750 people. Please let us know if this information is not accurate and our records need to be updated.

Based on these characteristics of your water system, the GWR will affect you in the following ways:

- If your monthly routine bacteriological sample is total coliform-positive, you must collect at least one sample from each ground water source in use at the time the total coliform-positive sample was collected. This follow-up sample, referred to as a triggered source water sample, must be tested for a state-approved fecal indicator. For our state, the fecal indicator that has been approved is *E. coli*.

- If your triggered source water sample tests positive for *E. coli*, you must collect five additional samples from the source that tested positive and have them analyzed for *E. coli*.

- Since your system serves fewer than 1,000 people, you may use the triggered source water sample collected from a ground water source (as described above) to meet both the requirements of the GWR and part of the requirements for repeat sampling under the Total Coliform Rule (TCR) when you have a coliform positive-sample in the distribution system.

- In the future, your system will be receiving a sanitary survey by the state every 3 years instead of every 5 years.

- If your system has an *E. coli* positive triggered source water sample or if a significant deficiency is identified at your system and not addressed, you will be required to make special notice to the public that your source water tested *E. coli* positive or that an uncorrected significant deficiency exists at your system.

A Quick Reference Guide and Factsheets on the GWR are enclosed. The Quick Reference Guide provides more information on this regulation, and the Factsheets explain the monitoring and corrective actions in more detail. In addition to these materials, please refer to additional guidance and the state regulations addressing the GWR requirements on the state Web site at **www.xxxxx.xx.gov**. We will be notifying you of upcoming training opportunities within the next month.

Please contact Ann Smith at this office at (555) 555-1234 if you have any questions about this letter or the GWR and its effect on your system. We appreciate your attention to this request.

Sincerely,
Enclosures: GWR Quick Reference Guide, GWR Factsheets, [list other enclosures]

3.4 Data Management Systems

Although state data management systems vary to suit state-specific requirements and needs, EPA recommends that all states ensure that their data management systems are capable of efficiently tracking affected PWSs, compliance status, and other information needed to implement the GWR. States using SDWIS/State should see the module incorporated in version 2.2.

Under GWR recordkeeping requirements, states are required to keep any currently applicable or most recent state determinations, along with all supporting information and explanations of the technical basis of each decision, for the following:

- Written notice of significant deficiencies.
- Corrective action plans, schedule approvals, and state-specified interim measures.
- Confirmation that a significant deficiency has been corrected or the fecal contamination in the ground water source has been addressed.
- State determinations and records of a GWS' documentation for not conducting triggered source water monitoring.
- State approvals of source water monitoring plans.
- Notices of the minimum residual disinfection concentration (when using chemical disinfection) needed to achieve at least 4-log virus inactivation before or at the first customer.
- Notices of the state-specified monitoring and compliance requirements (when using membrane filtration or alternative treatment) needed to achieve at least 4-log treatment of viruses before or at the first customer.
- Written notice from the GWS that it provides at least 4-log treatment of viruses before or at the first customer for a ground water source.
- Written determinations that the GWS may discontinue 4-log treatment of viruses.

A state may have information in its data system about the application of a disinfectant to the ground water source. The state may not, however, actually track whether this treatment meets the 4-log inactivation standard. In some data systems, it may not be possible to tell which disinfecting systems actually provide 4-log inactivation. As a result, there may need to be a separate water system-by-water system review to determine whether there is adequate inactivation to identify a system as providing 4-log treatment of viruses. The state's database system may need to be modified to capture this distinction.

3.5 Address Special Primacy Requirements of the GWR

States must provide EPA with specific information in their primacy packages in order to obtain federal approval of their program revisions adopting the provisions of the GWR. Some primacy conditions address the need for a state to have sufficient legal authority to enforce the GWR's requirements. In addition, some provisions of the GWR allow state discretion in establishing decision-making criteria. States will need to explain their intended procedures for implementing those provisions. The special primacy requirements are listed in 40 CFR 142.16(o) and are discussed in more detail in Section 4.4, and include but are not limited to the following:

- The state must have the appropriate rules or other legal authority to ensure that GWSs:
- Conduct source water monitoring. (See Section 4.4.1)
- Take the appropriate corrective actions including interim measures, if necessary, needed to address significant deficiencies. (See Section 4.4.2)
- Take the appropriate corrective actions including interim measures, if necessary, to address any source water fecal contamination identified during source water monitoring. (See Section 4.4.3)
- Consult with the state regarding corrective action(s). (See Section 4.4.)
- The state must describe how it will implement a sanitary survey program that includes the components of, and meets the survey frequencies required by, the GWR. (See Section 4.4.5)
- The state must describe the criteria that will be used for the following issues related to source water monitoring: (See Section 4.4.6)
- Extending the 24-hour time limit for a system to collect a ground water sample to comply with the source water monitoring requirements.
- Determining whether the cause of a total-coliform positive sample taken under the TCR is directly related to the distribution system.
- Determining whether to invalidate a fecal-indicator positive ground water source sample.
- Conditions that would allow source water microbial monitoring at a location after treatment.
- The state must explain the practices and procedures that will be used to enforce the treatment technique requirements of the GWR, including: (See Section 4.4.7)
- How the state will determine whether a system is achieving at least 4-log treatment of viruses.
- How the state will determine the minimum residual disinfectant concentration the system must provide before the first customer, for systems using chemical disinfection.
- Alternative technologies GWSs can use to achieve at least 4-log treatment of viruses.

- Monitoring and compliance requirements required for systems using state-approved alternative technologies to achieve at least 4-log treatment of viruses.

- Monitoring, compliance, and membrane integrity testing requirements that will be used to demonstrate virus removal for GWSs using membrane filtration.

- Criteria the state will use to determine if a GWS may discontinue 4-log treatment of viruses.

3.6 State Practices or Procedures for Sanitary Surveys

The state must perform sanitary surveys for community and noncommunity GWSs at prescribed time intervals. These surveys must address the following eight elements:

- Source.
- Treatment.
- Distribution System.
- Finished Water Storage.
- Pumps, Pump Facilities, and Controls.
- Monitoring and Reporting and Data Verification.
- System Management and Operation.
- Operator Compliance with State Requirements.

States should ensure resources are adequate to meet the sanitary survey requirements given the number of affected GWSs, anticipated follow-up technical assistance and enforcement needs, and other program demands. Note that compliance with only the TCR sanitary survey criteria may not be adequate to meet the revised scope and frequency of sanitary survey requirements required under the GWR.

The state may conduct the sanitary surveys in stages or phases if all the applicable elements are evaluated within the required timeframe. For example, states may opt to use data collected during site visits for other programs such as the Source Water Assessment Program (SWAP), Wellhead Protection Program (WHPP), Operator Training and Certification Program, and other technical assistance programs.

3.6.1 Sanitary Surveys for CWSs

Sanitary surveys must be completed by the state for CWSs every 3 years. The state may reduce the frequency of sanitary surveys of a CWS to every 5 years if the system either provides at least 4-log treatment of viruses (using inactivation, removal, or a state-approved combination of virus inactivation and removal) before or at the first customer for each ground water source, or if it has an outstanding performance record that was documented during previous inspections and no history of total coliform maximum contaminant level (MCL) or monitoring violations under 40 CFR 141.21 since the previous sanitary survey. If a state intends to use this provision, it must describe in its primacy package how it will determine whether a CWS has an outstanding performance record. Guidance on determining outstanding performance is provided in Section 4.4.

The first sanitary survey for a CWS required to comply with the requirements of the GWR must be conducted by December 31, 2012, unless the system has been put on a survey schedule of once every 5 years, as described above. For such systems, the first sanitary survey must be completed by December 31, 2014.

3.6.2 Sanitary Surveys for NCWSs

States are required to conduct sanitary surveys of noncommunity GWSs at least once every 5 years. The GWR does not allow additional time between surveys based on whether the NCWS has treatment in place or has demonstrated outstanding performance. The first sanitary survey for a NCWS required to comply with the requirements of the GWR must be conducted by December 31, 2014.

3.6.3 Significant Deficiencies

The state must provide GWSs with written notification specifying and describing any significant deficiencies. Notification must be provided no later than 30 days after identifying the deficiencies. The notice may specify corrective actions and deadlines the system must meet for implementing the corrective actions.

Once the system receives written notice of a significant deficiency, the system has up to 30 days to consult with the state regarding the appropriate corrective action it should take. Within 120 days from the time the system receives written notice of the significant deficiency, the system must either:

- Complete corrective action according to any applicable state plan review processes or state guidance and direction, or
- Be in compliance with a state-approved corrective action plan and schedule.

The state must confirm that the significant deficiency has been addressed through either written confirmation from the GWS or a site visit by the state. The site visit must occur within 30 days after the state has been notified by the system that the system meets the treatment technique requirements under 40 CFR 141.404(a). The state must maintain a record of the confirmation that a significant deficiency was corrected and will be required to report this information to EPA.

In its primacy application, the state must define and describe at least one specific significant deficiency in each of the eight sanitary survey elements. These should take into account:

- A defect in design, operation, or maintenance.
- A failure or malfunction of the sources, treatment, storage, or distribution system that may be causing, or has the potential to cause, the introduction of contamination into the water delivered to consumers.
- The state's ability to ensure GWSs take appropriate corrective actions, including interim measures, to address the significant deficiency.

Guidance on defining significant deficiencies is provided in section 4.4.5.4.

3.7 State Practices or Procedures for Source Water Microbial Monitoring

The GWR requires that GWSs conduct triggered source water monitoring as described below. States also have the option of directing systems to conduct assessment source water monitoring. While there are no federal requirements for assessment source water monitoring, the GWR offers some guidelines for states on the other monitoring requirements.

EPA believes that the most appropriate fecal indicator may vary from state to state or site to site. This may be due to regional or site-specific differences or other reasons that may be identified by the state. More information and guidance on this topic is provided in EPA's *Source Water Monitoring Guidance for Public Water Systems* (EPA 815-R06-005, February 2006).

3.7.1 Triggered Source Water Monitoring

The GWR requires systems performing triggered source water monitoring to monitor their ground water sources for one of three fecal indicators (*E. coli*, enterococci, or coliphage). The state must demonstrate in its primacy package it has the legal authority to require GWSs to monitor for the fecal indicator(s) identified. The state can specify which fecal indicator(s) GWSs will be required to test for in their ground water sources. States can alternatively approve more than one fecal indicator to be used (e.g., *E. coli* and/or enterococci). EPA recommends that states use the same requirements for GWSs performing assessment source water monitoring.

Triggered source water monitoring must be conducted by a GWS if the system does not provide at least 4-log treatment of viruses (using inactivation, removal, or a state-approved combination of inactivation and removal) before or at the first customer for each ground water source and conduct compliance monitoring, and it is notified of a total coliform-positive result for a sample collected under the TCR (40 CFR 141.21). Systems providing 4-log treatment of viruses must notify their state they provide treatment and must conduct compliance monitoring, or they will also be required to conduct triggered source water monitoring if they are notified of a total coliform-positive sample collected in compliance with the TCR.

Within 24 hours of notification of the total coliform-positive sample, the system must collect at least one source water sample from each ground water source in use at the time the total coliform-positive sample was collected. The state may extend the 24-hour limit on a case-by-case basis if the system cannot collect the source water sample within 24 hours due to circumstances beyond its control. In the case of an extension, the state must specify how much time the system has to collect the sample. See section 4.4.6.1 for additional guidance on extending the 24-hour time limit to collect triggered source water sample.

EPA recognizes that some water systems that use untreated ground water already have sample taps located at or near the source and prior to the first customer and include raw water monitoring with their routine TCR monitoring of the distribution system. States decide whether samples collected at these locations represent water in the distribution system as described in the TCR [40 CFR 141.21(a)]. If a GWS collects a source water sample as part of its TCR sampling, and the source water sample is analyzed using an approved method that includes the state-approved fecal indicator, and a distribution system sample collected at the same time is total coliform-positive, the GWS can use the concurrent source water sample to satisfy the triggered source water monitoring requirement.

GWSs serving 1,000 people or fewer that detect a total coliform-positive sample during their routine TCR monitoring may use a repeat TCR sample to satisfy both the GWR triggered source monitoring requirement and one of the repeat samples required by the TCR if the state allows the system to collect a repeat TCR sample at the source and the state approves the use of *E. coli* as a fecal indicator for GWR triggered source water monitoring.

In addition to public notification requirements, CWSs are required to provide special notice to the state and the public if a triggered source water sample is fecal indicator-positive. Guidance on public notice and special notice is provided in section 3.8.

If a triggered source water sample is fecal indicator-positive, states may require corrective action for the ground water source where the fecal indicator-positive sample was collected. If the state does not require

corrective action based on the initial indicator-positive sample, the system must collect five additional source water samples from the same source within 24 hours of being notified of the fecal indicator-positive sample. The samples must be tested for the same fecal indicator for which the initial triggered source water sample tested positive. If one or more of these additional source water samples is fecal indicator-positive, the system must take corrective action.

Representative source water monitoring

Systems with multiple sources may, if approved by the state, collect samples from representative source(s) for any total coliform-positive sample. The state may require systems with multiple sources to submit for approval a triggered source water monitoring plan. A triggered source water monitoring plan may evaluate each sample site in the system's TCR sample siting plan and identify sources that are representative of each TCR monitoring site. All water systems are encouraged to include a procedure for triggered source water monitoring in their standard operating procedures (SOPs). Larger systems with multiple sources may want to include in their SOPs a triggered source water sampling plan that identifies which sources are representative of which TCR monitoring sites. The state must approve any representative monitoring approach to triggered source water monitoring. Additional information on representative source water monitoring is available in EPA's *Triggered and Representative Monitoring Guide for the Ground Water Rule* (Under development).

Consecutive system triggered source water monitoring notification

In addition to all other triggered source water monitoring requirements, a consecutive system that has a total coliform-positive sample collected under 40 CFR 141.21 must notify the wholesale system within 24 hours of being notified of the total coliform-positive sample.

Wholesale system triggered source water monitoring

In addition to all other triggered source water monitoring requirements, if a wholesale system receives notice from a consecutive system that a sample collected under 40 CFR 141.21 is total coliform-positive, the wholesale system must, within 24 hours of being notified, collect a sample from every one of its ground water sources (unless the system has multiple sources and has been approved by the state to collect samples from representative source[s] for any total coliform-positive). The samples collected must be tested for a fecal indicator required by the state. If the sample is fecal indicator-positive, the wholesale system must notify any consecutive systems served by that source in accordance with 40 CFR 141.202 (Public Notifications of Drinking Water Violations).

Triggered source water monitoring positive sample invalidation

If a state determines and documents in writing that the total coliform-positive sample was solely a result of a documented distribution system deficiency, the state may invalidate the positive triggered source water monitoring sample. The state must maintain records of invalidation determinations. See section 4.4.6.3 for further discussion of sample invalidation and situations when it may be appropriate.

3.7.2 Assessment Source Water Monitoring

The GWR gives states the authority to direct GWSs to conduct assessment source water monitoring at the states' discretion. If a state intends to require assessment source water monitoring, it will need to specify in its state regulation the pertinent monitoring requirements, including sampling frequency and analytical methods.

EPA recommends that states require GWSs that are most susceptible to fecal contamination to conduct assessment monitoring. States may use hydrogeologic sensitivity assessments (HSAs) as a tool to identify high risk systems for assessment source water monitoring. HSAs can be an effective screening tool to identify sensitive hydrogeological settings that transmit water, and any pathogens in the water, quickly from the surface to the aquifer. Where the type of aquifer is unknown, states should consider conducting an HSA to identify sensitive aquifers and determine if assessment source water monitoring is appropriate.

States also have other information available to them to target high risk systems, such as source water assessments, wellhead protection plans, and historical monitoring data. Data indicating past episodes of source water fecal contamination, particularly from TCR monitoring, in combination with GWR triggered source water monitoring results, can be another important tool. States should refer to EPA's *Source Water Assessment Guidance Manual* for an overview of characteristics of a sensitive aquifer, determining if a sensitive aquifer has a hydrogeological barrier, and information on how source water assessments and hydrogeological sensitivity assessments may be used to guide assessment monitoring decisions.

The GWR provides the following general suggestions to states requiring assessment source water monitoring:

- Collect a total of 12 ground water source samples that represent each month the system provides ground water to the public.
- Collect samples from each well unless the system obtains written state approval to conduct monitoring at one or more wells within the PWS that are representative of multiple wells used by the system and that draw water from the same hydrogeological setting.
- Collect a standard sample volume of at least 100 mL for fecal indicator analysis, regardless of the fecal indicator or analytical method used.
- Analyze all ground water source samples for the presence of *E. coli*, enterococci, or coliphage using one of the analytical methods listed in the GWR.
- Collect ground water source samples at a location prior to any treatment of the ground water source unless the state approves a sampling location after treatment.
- Collect ground water samples at the well itself unless the system's configuration does not allow for such sampling and the state approves an alternate sampling location that is representative of the water quality of that well.

Positive source water samples taken under assessment monitoring are subject to the same requirements for additional sampling and/or subsequent corrective action as described above under triggered monitoring requirements.

3.7.3 Laboratory Methods

All triggered source water samples must be collected using a standard sample volume of at least 100 mL, regardless of fecal indicator or analytical method used. GWSs must test source water samples for the presence of *E. coli*, enterococci, or somatic coliphage, depending on which fecal indicator is specified by the state, and the state must require that laboratories use one of the analytical methods listed in Table 3-2.

Table 3-2. Laboratory Methods

Fecal Indicator	Methodology	Method Name
E. coli	Colilert Colisure Membrane Filter Method with MI Agar m-ColiBlue24 Test E*Colite Test EC-MUG NA-MUG	9223 B 9223 B EPA Method 1604 9221 F 9222 G
Enterococci	Multiple-Tube Technique Membrane Filter Technique Enterolert	9230 B 9230C, EPA Method 1600
Coliphage	Two-Step Enrichment Presence-Absence Procedure Single Agar Layer Procedure	EPA Method 1601 EPA Method 1602

Analysis must be conducted in accordance with the documents listed in the final GWR promulgated November 8, 2006.

3.7.4 Invalidation of a Fecal Indicator-Positive Ground Water Source Sample

The state can invalidate a fecal indicator-positive triggered source water sample if the system provides the state with written notice from the laboratory that improper sample analysis occurred, or the state determines and documents in writing that there is substantial evidence a fecal indicator-positive sample is due to a circumstance that does not reflect source water quality.

If the state invalidates a fecal indicator-positive ground water source sample, the state must require the system to collect another source water sample within 24 hours of being notified of sample invalidation. The system must have the follow-up sample analyzed for the same fecal indicator as the invalidated sample.

The state may extend the 24-hour limit on a case-by-case basis if the system cannot collect the source water sample within 24 hours due to circumstances beyond its control. In the case of an extension, the state must specify how much time the system has to collect the sample. The state must maintain records of all invalidated fecal indicator-positive ground water source samples.

3.8 Public Notification, CCR, and Special Notice Requirements

Several general categories of notification are required by the GWR:

- Public Notification (PN) Tier 1, 2, or 3 public notification
  - Community and Noncommunity GWSs
- Consumer Confidence Report (CCR) Water Quality Data Table
  - Community GWSs
- Special Notice
  - Community GWSs – Notice included in CCR
  - Noncommunity GWSs

The type of notification required depends on the violation or scenario that has occurred at the PWS. Table 3-3 summarizes public notification, CCR and special notice requirements of the GWR. Note that special notice requirements for community GWSs require notification to be included in the system's CCR. Noncommunity GWSs that are required to make special notice must inform the public served by the water system in a manner approved by the state. See section 3.8.3 for an explanation of the GWR's special notice requirements.

Table 3-3. Public Notification, CCR, and Special Notice Requirements

Issue	Notification Required
Uncorrected significant deficiency – *CWSs*[1]	Special Notice in CCR
Uncorrected significant deficiency – *NCWSs*[1]	Special Notice
Fecal indicator positive ground water source sample – *CWS*[2]	Tier 1 PN and Special Notice in CCR
Fecal indicator positive ground water source sample – *NCWS*[2]	Tier 1 PN
Fecal indicator-positive ground water source sample (until corrective action is completed) – *CWSs*[3]	Special Notice in CCR
TT – Failure to take corrective action – *CWSs*	Tier 2 PN, CCR
TT – Failure to take corrective action – N*CWSs*	Tier 2 PN
TT – Failure to maintain at least 4-log treatment of viruses for GWSs conducting compliance monitoring – *CWSs*	Tier 2 PN, CCR
TT – Failure to maintain at least 4-log treatment of viruses for GWSs conducting compliance monitoring – *NCWS*	Tier 2 PN
Failure to meet monitoring requirements – *CWSs*	Tier 3 PN, CCR
Failure to meet monitoring requirements – N*CWSs*	Tier 3 PN
All detects from source water monitoring or range of results for chemical disinfectants	CCR Water Quality Data Table

1. Systems must continue to notify the public annually until the significant deficiency has been corrected.
2. Consecutive systems served by the ground water source must also notify the public.
3. CWSs must continue to notify the public annually until the state determines the fecal contamination has been corrected.

3.8.1 Public Notification Requirements

If a ground water source sample collected as a triggered source water sample or collected in response to the state's direction to conduct source water assessment monitoring is fecal indicator-positive and is not invalidated, then the PWS must conduct public notification under 40 CFR 141.202. Public notification must also be made by consecutive systems served by the fecal indicator-positive ground water source. This Tier 1 notification requirement is regardless of whether the system is a CWS or a NCWS.

For this Tier 1 public notice, systems must use the following standard health effects language for their public notifications:

> *Fecal indicators are microbes whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-*

term health effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely compromised immune systems.

The GWR also requires Tier 2 public notification when PWSs have one of the following violations:

- Failure to take corrective action.
- Failure to maintain at least 4-log treatment of viruses.

The GWR also requires systems to make Tier 3 notification if that have failed to meet the GWR's monitoring requirements. Examples of Tier 2 and 3 public notices under these circumstances are provided in Section 6 of this guidance manual.

3.8.2 Consumer Confidence Report (CCR) Requirements

The GWR requires two general categories of notice to be included in the CCR. Community GWSs with uncorrected significant deficiencies and/or a fecal indicator-positive source water sample must inform their customers of any significant deficiency that is uncorrected and any fecal-indicator positive source water sample result in the CCR addressing the appropriate year. Section 3.8.3 describes this special notice requirement in more detail.

Community GWSs that fail to meet the treatment technique requirements of the GWR are also required to inform their customers of their treatment technique violations in the CCR. The GWR treatment technique violations that community GWSs are required to inform their customers of in their CCRs are:

- Failure to take corrective action.
- Failure to maintain at least 4-log treatment of viruses.

3.8.3 Special Notice Requirements

Community GWSs must inform customers in the appropriate year's CCR of any uncorrected significant deficiencies and any fecal-indicator positive source water sample results. For example:

- A community GWS receives notification from the state of a fecal indicator-positive source water sample. The system must inform its customers of positive sample in the CCR that addresses the year in which the sample was taken.

- A community GWS with an uncorrected significant deficiency must inform its customers of the uncorrected significant deficiency in that year's CCR.

- In a situation where a system had a significant deficiency in the same calendar year (e.g., 2011) in which a CCR is being published (e.g., published in 2011 but addressing 2010), and that significant deficiency has not been corrected, the community GWS does not have to inform its customers until the following CCR (e.g., published in 2012 but addressing 2011). However, the system needs only to inform its customers of that significant deficiency if the deficiency remains uncorrected at the time of the following year's CCR publication and release. The system must continue to notify the public annually until the state determines that the deficiency or contamination has been addressed.

In addition to the Tier 1 public notification requirement associated with a fecal indicator-positive triggered source water sample, noncommunity GWSs must also provide special notice within 12 months

of the system being notified by the state of the deficiency, in a manner approved by the state, of any significant deficiency that has not been corrected. The state may direct the system to provide this notification earlier than the 12 months required by the GWR. The system must continue to notify the public annually until the significant deficiency is corrected.

The noncommunity GWS notification must include:

- The nature of the significant deficiency and the date it was identified by the state.
- The state-approved plan and schedule for correction of the significant deficiency, including interim measures, progress to date, and any interim measures completed.
- For systems with a large proportion of non-English speaking consumers, as determined by the state, information in the appropriate language(s) regarding the importance of the notice or a telephone number or address where consumers may contact the system to obtain a translated copy of the notice or assistance in the appropriate language.

If directed by the state, a NCWS with significant deficiencies that have been corrected may be required to inform its customers how the significant deficiencies were corrected and the date they were corrected.

3.9 State Practices and Procedures for Treatment Technique Requirements

The GWR identifies four possible corrective action options. The state must require systems that need to take corrective actions to take one or more of the following:

- Correct all significant deficiencies.
- Provide an alternate source of water.
- Eliminate the source of contamination.
- Install technologies that reliably achieve at least 4-log treatment of viruses (using inactivation, removal, or a state-approved combination of 4-log virus inactivation and removal) before or at the first customer for each ground water source.

The state must report the date the GWS completed the required corrective action. The state must also maintain:

- Records of written notices from GWSs that document the system is providing at least 4-log treatment of viruses (using inactivation, removal, or a state-approved combination of 4-log virus inactivation and removal) before or at the first customer for each ground water source.
- Records of notices sent to systems identifying the residual disinfection concentrations (when using chemical disinfection) needed to achieve at least 4-log treatment of viruses (using inactivation, removal, or a state-approved combination of 4-log virus inactivation and removal) before or at the first customer for each ground water source.
- Notices sent to systems identifying the state-specified monitoring and compliance criteria (when using membrane filtration or alternative treatment) needed to achieve at least 4-log treatment of virus before or at the first customer.

3.9.1 Corrective Action Alternatives

The GWR gives states the option to prescribe specific corrective actions depending on the nature of the significant deficiency. There may be a number of corrective action alternatives that could be applied to correct the significant deficiency effectively. The state may choose not to specify corrective action, but rather allow the system to select the most appropriate corrective action and ultimately be responsible for the choice.

Two basic approaches that can be taken to ensure significant defects are corrected include:

- Correction of problems by the water system staff, their consulting engineers, and/or contractor.

- Many deficiencies can be addressed by water system staff and their consultants. However, the state should assess whether the water system has trained and competent staff before suggesting approaches that involve water system personnel. The state should consider the cause of the deficiency (how and why it developed) and judge whether it is reasonable to expect the water system operator or manager to correct the problem.

- Other deficiencies may be of a nature that would require the oversight of a licensed professional engineer and may have to go through the state's plan and specification review and approval (or permitting) processes.

- Technical assistance to the water utility by the regulatory agency, organizations that specialize in training and technical assistance, and/or peers at other water systems.

- Many water systems may need assistance to eliminate significant deficiencies. The state may be able to offer the system approaches and resources to assess and address problems. Assistance may result in training; onsite system specific technical assistance; and referrals to other available resources at the state, other organizations (e.g., local Rural Water Associations), and state environmental training centers.

A combination of these approaches may be appropriate, based on the type of significant deficiency.

3.9.2 Process for Determining 4-log Treatment of Viruses

The state must explain the criteria that it will use to determine when a GWS has met the requirements for 4-log treatment of viruses. Criteria may include determination of the appropriate treatment technology, treatment design and specifications constituting sufficient inactivation and or removal, the minimum contact time (in minutes) required for compliance to be achieved at the minimum disinfectant residual (in mg/L), and submission of records of CT (contact time in minutes X residual disinfectant in mg/L, measured as mg/L-minutes) calculations or records documenting maintenance of a minimum disinfectant residual.

EPA recommends that states consider using the applicable EPA-developed virus CT tables provided in section 4 of this Guidance (Tables 4-4 through 4-6) to determine the concentration and contact time requirements necessary to achieve 4-log virus inactivation using chemical disinfection. If alternative criteria will be used by GWSs for compliance, the state must describe the treatment and compliance monitoring basis for the specified 4-log virus inactivation method. The description should include how the state will factor into its determination contact time correction factors (e.g., baffling factors), pH,

temperature, flow, and minimal residuals. Section 4.4.7 provides more guidance on determining 4-log treatment of viruses.

3.9.3 Process for Determining Minimum Residual Disinfectant Concentration Prior to First User

Systems conducting compliance monitoring and providing chemical disinfection must maintain a minimum residual disinfectant concentration at or before the first customer. Residual disinfectant concentration is the concentration of the disinfectant (in milligrams per liter, or mg/L) at a point before or at the first customer.

The state primacy application must include an explanation and rationale for how the state will decide what that minimum residual disinfectant concentration will be for each system. If the state sets the minimum residual disinfectant concentration level on a system-by-system basis, the application should explain the rationale for this approach and the information required from the systems to be used in the determination.

3.9.4 Alternative Technologies for Achieving 4-log Treatment of Viruses

States should identify alternative technologies that a GWS may use alone or in combination with other approved technologies to achieve at least 4-log treatment of viruses, removal, or a state-approved combination of these technologies before or at the first customer. A state's primacy application should include a list of the approved alternative technologies.

3.9.5 Membrane Filtration Requirements to Demonstrate Virus Removal

Criteria should ensure maintenance of the integrity of the membrane to prevent passage of virus particles. Criteria may include routine pressure testing and reporting of the results as prescribed by the membrane manufacturer, turbidity monitoring, monitoring of an associated chemical parameter (e.g., total dissolved solids, total organic carbon), and other site-specific variables.

3.9.6 Monitoring and Compliance Requirements for Systems Providing 4-log Treatment of Viruses

Compliance monitoring must be conducted by a GWS that does not conduct source water monitoring under 40 CFR 141.403(a) because the system is providing at least 4-log treatment of viruses (using inactivation, removal, or a state-approved combination of 4-log virus inactivation and removal) before or at the first customer for each ground water source. A GWS not required to conduct source water monitoring must notify the state that it provides at least 4-log treatment of viruses (using inactivation, removal, or a state-approved combination of 4-log virus inactivation and removal) before or at the first customer for each ground water source and must begin compliance monitoring. Compliance monitoring requires the system to monitor the effectiveness and reliability of its treatment before or at the first customer.

The state must report all GWSs that are providing at least 4-log treatment of viruses (using inactivation, removal, or a state-approved combination of 4-log virus inactivation and removal) before or at the first customer for each ground water source. Section 4.4 provides additional guidance on compliance monitoring and on the establishment of compliance monitoring requirements.

Under 40 CFR 141.405(a), PWSs that are conducting compliance monitoring must notify the state any time they fail to meet any state-specified compliance criteria. These state-specified compliance criteria may include, but are not limited to, minimum residual disinfectant concentration, membrane operating criteria or membrane integrity, and alternative treatment operating criteria. In addition, some PWSs will need to report that they did not conduct compliance monitoring according to their requirements or did not restore monitoring within 4 hours of a problem being identified. The PWS must notify the state as soon as possible, but in no case later than the end of the next business day. PWSs that must implement a corrective action must notify the state within 30 days of the completion of state-specified corrective actions.

3.9.6.1 PWSs Using a Chemical Disinfectant and Serving More than 3,300 People

A GWS that serves more than 3,300 people must monitor the residual disinfectant concentration continuously. The residual disinfectant concentration must be monitored at a location approved by the state, and the system must record the lowest level of residual disinfectant concentration for each day that it is in operation. Every day the GWS serves water to the public, the system must maintain the minimum state-determined residual disinfectant concentration. If the continuous monitoring equipment fails, the system must conduct grab sampling every 4 hours until the continuous monitoring equipment is back on line. The system has 14 days to resume continuous monitoring before a violation is incurred.

States are encouraged to provide GWSs with a form that facilitates compliance with chemical disinfectant residual monitoring and reporting requirements. Example 3-3 provides a form that could be adapted to state requirements and distributed to systems serving more than 3,300 people. Some states may wish to require GWSs to provide all the monitoring data required to calculate daily CTs. If so, the reporting forms should be modified and additional authority for requiring the necessary monitoring and reporting should be incorporated into the state's rules.

3.9.6.2 PWSs Using a Chemical Disinfectant and Serving 3,300 People or Fewer

A GWS that serves 3,300 or fewer people must:

- Monitor the residual disinfectant concentration during peak hourly flow or another time designated by the state, at a location approved by the state.
- Record the level of residual disinfectant concentration for each day it is in operation.
- Take a daily grab sample during the hour of peak flow or at another time specified by the state. If any daily grab sample measurement falls below the minimum state-determined residual disinfectant concentration, the GWS must take follow-up samples every 4 hours until the residual disinfectant concentration returns to above the minimum state-determined level.
- Maintain the minimum state-determined residual disinfectant concentration every day the GWS serves water to the public.

A GWS using ground water and serving 3,300 or fewer people may also meet the compliance monitoring requirements by monitoring the chemical disinfectant residual continuously in accordance with the requirements for systems serving more than 3,300 people.

Example 3-4 provides a form that could be adapted and used by systems serving 3,300 people or fewer. Some states may wish to require GWSs to provide all the monitoring data required to calculate daily CTs.

If so, the reporting forms should be modified and additional authority for requiring the necessary monitoring and reporting should be incorporated into the state's rules.

3.9.6.3 PWSs Using Membrane Filtration

A GWS that uses membrane filtration to meet the treatment technique requirements must monitor the membrane filtration process in accordance with state-specified monitoring requirements. A GWS that uses membrane filtration is in compliance with the treatment requirement to achieve at least 4-log removal of viruses when:

- The membrane has an absolute molecular weight cut-off or an alternate parameter that describes the exclusion characteristics of the membrane and can reliably achieve at least 4-log removal of viruses.
- The membrane process is operated in accordance with state-specified compliance requirements; and
- The integrity of the membrane is intact.

3.9.6.4 PWSs Using State-Alternative Treatment

A GWS that uses a state-approved alternative treatment to meet the treatment technique requirements must monitor the alternative treatment in accordance with any state-specified monitoring requirements. A system that uses a state-approved alternative treatment must operate the alternative treatment in accordance with any compliance criteria that the state determines to be necessary to demonstrate 4-log virus inactivation, removal, or a state-approved combination of these technologies.

Example 3-3. Example Monthly Operations Report for GWSs Serving More Than 3,300 People

Public Water System Name				Reporting Month/Year	
Public Water System ID				County	Town, Village, or City
Date	**Time**	**Source(s) in use**	**Lowest free chlorine residual at entry point to distribution system (mg/l)**	**For systems using chlorine dioxide, lowest chlorine dioxide residual at entry point (mg/L)**	**Additional or Other Treatment (define here)**
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					

Public Water System Name				Reporting Month/Year	
Public Water System ID				County	Town, Village, or City
Date	**Time**	**Source(s) in use**	**Lowest free chlorine residual at entry point to distribution system (mg/l)**	**For systems using chlorine dioxide, lowest chlorine dioxide residual at entry point (mg/L)**	**Additional or Other Treatment (define here)**
30					
31					

Did continuous monitoring equipment fail at any time this reporting month? _____ If so, were grab samples collected every four hours until the continuous monitoring equipment was returned to service? _____ Attach grab sample results and submit with this form.	Date continuous monitoring equipment failed _____ Date it was returned to service _____

Reported by: _____	Title: _____	Operator Certification Number: _____
Signature: _____	Date: _____	Operator Grade Level: _____

Example 3-4. Example Monthly Operation Report for GWSs Serving 3,300 People or Fewer

Public Water System Name				Reporting Month/Year	
Public Water System ID				County	Town, Village, or City
Date	**Time**	**Source(s) in use**	**Free chlorine residual at entry point to distribution system (mg/l)**	**For systems using chlorine dioxide, lowest chlorine dioxide residual at entry point (mg/L)**	**Additional or Other Treatment (define here)**
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					

Public Water System Name				Reporting Month/Year	
Public Water System ID				County	Town, Village, or City
Date	**Time**	**Source(s) in use**	**Free chlorine residual at entry point to distribution system (mg/l)**	**For systems using chlorine dioxide, lowest chlorine dioxide residual at entry point (mg/L)**	**Additional or Other Treatment (define here)**
30					
31					
Was the chlorine residual ever less than _____ mg/L? _____					
If so, did you monitor every four hours until it returned to _____ mg/L? _____ Attach those results and submit them with this form.					
Reported by: _____		Title: _____		Operator Certification Number: _____	
Signature: _____		Date: _____		Operator Grade Level: _____	

3.9.7 Criteria for Discontinuing 4-log Treatment of Viruses

A GWS may discontinue providing 4-log treatment of viruses (using inactivation, removal, or a state-approved combination of 4-log virus inactivation and removal) if the state determines that 4-log treatment of viruses is no longer necessary. In order for a system to discontinue treatment, the state must make a determination that the system has met the necessary criteria for discontinuing treatment. The state must document its determination in writing and maintain a record of the determination.

A system that discontinues 4-log virus treatment of viruses (using inactivation, removal, or a state-approved combination of 4-log virus inactivation and removal) is subject to triggered source water microbial monitoring and analytical methods requirements of the GWR.

3.9.8 Treatment Technique Violations

The following treatment technique violations require Tier 2 notice to be given be given to the public [40 CFR subpart Q (Public Notification of Drinking Water Violations)].

- A GWS that has a significant deficiency is in violation of the treatment technique requirement if, within 120 days (or earlier if directed by the state) of receiving written notice from the state of the significant deficiency, the system:
  - Does not complete corrective action in accordance with applicable state plan review processes or other state guidance and direction, including state specified interim actions and measures; or,
  - Is not in compliance with a state-approved corrective action plan and schedule.

- Unless the state invalidates a fecal indicator-positive ground water source sample, a GWS is in violation of the treatment technique requirement if, within 120 days of receiving notice (or earlier if directed by the state) the system:

  – Does not complete corrective action in accordance with any applicable state plan review processes or other state guidance and direction, including state specified interim measures; or,

  – Is not in compliance with a state-approved corrective action plan and schedule.

- A GWS that collects compliance monitoring samples and fails to maintain at least 4-log treatment of viruses (using inactivation, removal, or a state-approved combination of 4-log virus inactivation and removal) before or at the first customer for a ground water source, is in violation of the treatment technique requirement if the failure is not corrected within 4 hours of determining the system is not maintaining at least 4-log treatment of viruses before or at the first customer.

3.9.9 Monitoring Violations

Any GWS that fails to meet the ground water source microbial monitoring and analytical methods under 40 CFR 141.402 (a) - (f) or fails to meet the compliance monitoring requirements under 40 CFR 141.403(b) is in violation of the monitoring requirements of the GWR. These monitoring requirements are:

- Triggered source water monitoring.
- Additional source water monitoring.
- Assessment source water monitoring.
- Compliance monitoring.

These monitoring violations require Tier 3 notice to be given to the public pursuant to 40 CFR subpart Q (Public Notification of Drinking Water Violations).

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Section 4

State Primacy Revision Application

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40 CFR Part 142 sets out requirements for states to obtain and/or retain primary enforcement responsibility (primacy) for the Public Water System Supervision (PWSS) program as authorized by Section 1413 of the Safe Drinking Water Act (SDWA). The 1996 SDWA Amendments updated the process for states to obtain and/or retain primacy. On April 28, 1998, EPA promulgated the Primacy Rule to reflect these statutory changes (63 *FR* 23361).

4.1 State Primacy Program Revision

Pursuant to 40 CFR142.12, complete and final requests for approval of program revisions to adopt new or revised EPA regulations must be submitted to the EPA Administrator no later than 2 years after promulgation of new or revised federal regulations. Until EPA approves those applications, EPA regions have responsibility for directly implementing the new or revised regulations although the state and EPA can agree to implement a rule together during this period.

States that have primacy for all existing National Primary Drinking Water Regulations (NPDWRs) are considered to have interim primacy for any new or revised regulation. If a state is eligible for interim primacy, it will have full implementation and enforcement authority. Interim primacy for the Ground Water Rule (GWR) would begin on the date the state submits it's final and complete primacy revision application or the effective date of the new state regulation (whichever is later), and ends when EPA makes a final determination (see Table 4-1).

A state may be granted an extension of up to 2 years to submit its application package. During any extension period, an extension agreement outlining the state's and EPA's responsibilities is required.

Table 4-1. State Rule Implementation and Revision Timetable for the GWR

EPA/State Action	Time Frame
GWR promulgated	November 8, 2006
State and region establish a process and agree upon a schedule for application review and approval (optional)	January 8, 2007
State, at its option, submits *draft* program revision package to region including: Preliminary Approval Request, Draft State Regulations and/or Statutes, Regulation Crosswalk	May 8, 2007
Regional (and Headquarters if necessary) review of draft	Completed within 90 days of state submittal of draft (suggested)
State submits final program revision package to region including: • Adopted State Regulations • Regulation Crosswalk • 40 CFR 142.10 Primacy Update Checklist • 40 CFR 142.14 and 142.15 Reporting and Recordkeeping • 40 CFR 142.16 Special Primacy Requirements • Attorney General's Enforceability Certification	November 8, 2008[1]
Rule compliance date	December 1, 2009
States with approved extensions submit complete and final program revision package	November 8, 2010[2]

EPA/State Action	Time Frame
EPA final review and determination: • Regional review [program and Office of Regional Counsel (ORC)] • Headquarters concurrence and waivers [Office of Ground Water and Drinking Water (OGWDW) and Office of Enforcement and Compliance Assistance (OECA)] • Public notice • Opportunity for hearing • EPA's determination	Completed within 90 days of state submittal of final program revision package 45 days region 45 days Headquarters(HQ)[3]

1. EPA suggests submitting an application by August 8, 2008 to ensure timely approval. EPA regulations allow states until November 8, 2008 for this submittal. An extension of up to 2 years may be requested by the state.

2. EPA suggests submitting an application by August 8, 2010 for states with approved extensions to ensure timely approval.

3. At least one state per region.

4.1.1 The Revision Process

EPA recommends a two-step process for approval of state program revisions. The steps consist of submission of a draft request (optional) and submission of a complete and final request for program approval. Figure 4-1 diagrams these processes and their timing.

Draft Request—The state may submit a draft request for EPA review and tentative determination. The request should contain drafts of all required primacy application materials (with the exception of a draft Attorney General's Statement). A draft request should be submitted as soon as practicable; EPA recommends submitting it within 6 months of rule promulgation. EPA will make a tentative determination as to whether the state program meets the applicable requirements. EPA intends to make a tentative determination within 90 days.

Complete and Final Request—This submission must be in accordance with 40 CFR 142.12(c)(1) and (2) and include the Attorney General's statement. The state should also include its response to any comments or program deficiencies identified in the tentative determination (if applicable). Submission of only a final request may make it more difficult for states to address any necessary changes within the allowable time for state rule adoption.

EPA recommends that states submit their complete and final revision package within 21 months of rule promulgation (or by August 8, 2008 for the GWR). This will ensure that states will have interim primacy as soon as possible and will prevent backlogs of revision applications to adopt future federal requirements.

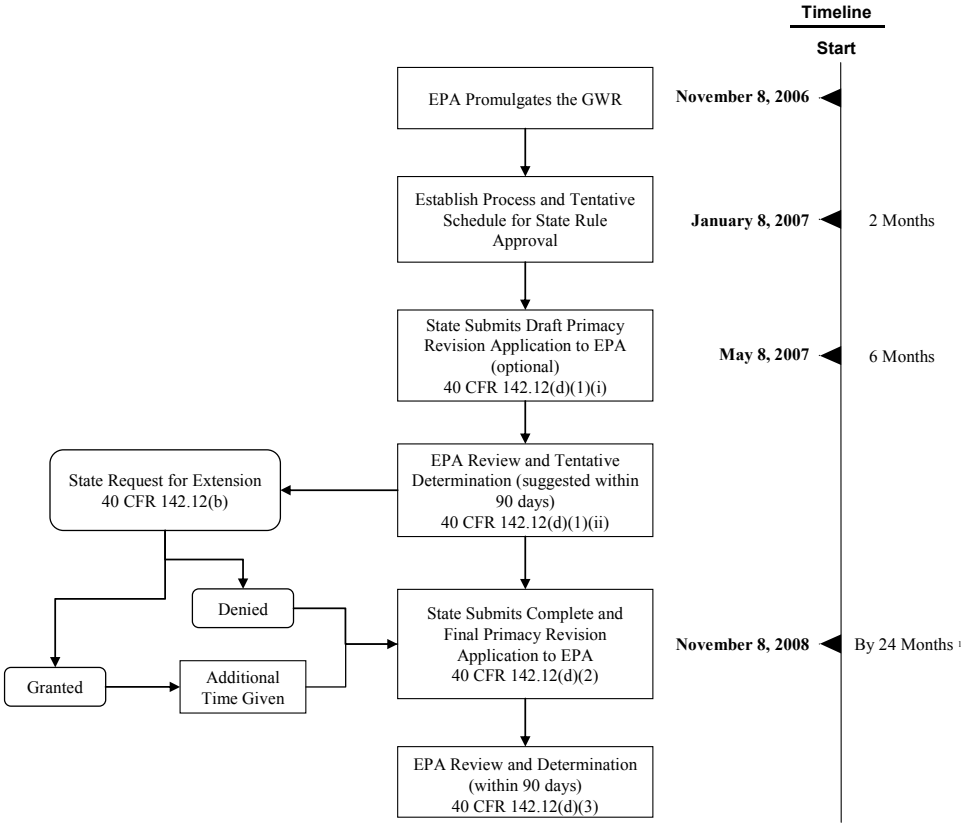
The state and region should agree to a plan and timetable for submitting the state primacy revision application as soon as possible after rule promulgation—ideally within 2 months of promulgation.

4.1.2 The Final Review Process

Once a state application is complete and final, EPA has a regulatory (and statutory) deadline of 90 days to review, and approve or disapprove the revised program. OGWDW will conduct a detailed concurrent review of the first state package from each region. The regional office should submit its comments with the state's package within 45 days for review by HQ. When the region has identified all significant issues, OGWDW waives concurrence on all other state programs in that region, although EPA HQ retains the option to review additional state programs as appropriate. The Office of General Counsel (OGC) has delegated its review and approval to the ORC.

In order to meet the 90-day deadline for packages undergoing review by HQ, the review period is equally split by giving the regions and HQ 45 days each to conduct their respective reviews. For the first package in each region, regions should forward copies of the primacy revision applications and their evaluations to the Drinking Water Protection Division Director in OGWDW no later than 45 days after state submittal. The Drinking Water Protection Division Director takes the lead on the HQ review process.

Figure 4-1. Recommended Review Process for State Request for Approval of Program Revisions



[1] An extension of up to 2 years may be requested by the state.

4.2 State Primacy Program Revision Extensions

4.2.1 The Extension Process

Under 40 CFR 142.12(b), a state may request that the 2 year deadline for submitting the complete and final program revision package be extended for up to 2 additional years. The extension request must be submitted to EPA within 2 years of the date that EPA published the regulation. The Regional Administrator has been delegated authority to approve extension applications. Concurrence by HQ on extensions is not required.

Therefore, the state must either adopt regulations pertaining to the GWR and submit a complete and final primacy revision application by November 8, 2008, or request an extension of up to 2 years by that date.

4.2.2 Extension Request Criteria

For an extension to be granted under 40 CFR 142.12(b), the state must demonstrate that it is requesting the extension because it cannot meet the original deadline for reasons beyond its control and despite a good faith effort to do so. A critical part of the extension application is the state's proposed schedule for submission of its complete and final request for approval of a revised primacy program. The application must also demonstrate at least one of the following:

(i) That the state currently lacks the legislative or regulatory authority to enforce the new or revised requirements;

(ii) That the state currently lacks the program capability adequate to implement the new or revised requirements; or,

(iii) That the state is requesting the extension to group two or more program revisions in a single legislative or regulatory action.

In addition, the state must be implementing the EPA requirements to be adopted in its program revision within the scope of its current authority and capabilities.

4.2.3 Conditions of the Extension

Until the State Primacy Revision Application has been submitted, the state and EPA regional office will share responsibility for implementing the primary program elements as indicated in the extension agreement. The state and the EPA regional office should discuss these elements and address terms of responsibility in the agreement. PWSs should be notified of a contact person at the EPA Region if they want to ask questions or obtain information about the GWR before the state has primacy.

These conditions will be determined during the extension approval process and are decided on a case-by-case basis. The conditions must be included in an extension agreement between the state and the EPA regional office.

Conditions of an extension agreement may include:

- Informing PWSs of the new EPA (and upcoming state) requirements and the fact that the region will be overseeing implementation of the requirements until they approve the state program revisions or until the state submits a complete and final revision package if the state qualifies for interim primacy.

- Collecting, storing, and managing laboratory results, public notices, and other compliance and operation data required by the EPA regulations.

- Assisting the region in the development of the technical aspects of enforcement actions and conducting informal follow-up on violations (e.g., telephone calls, letters).

- Providing technical assistance to PWSs.

- For states whose request for an extension is based on a current lack of program capability adequate to implement the new requirements, taking steps agreed to by the region and the state to remedy the deficiency during the extension period.

- Providing the region with all the information required under 40 CFR 142.15 for state reporting.

Example 4-1 provides a checklist the region can use to review state extensions or to create an extension agreement.

Until states have primacy, EPA is the primary enforcement authority; however, states historically have played a role in implementation for various reasons—most important because states have local knowledge, expertise, and established relationships with their systems.

The state and EPA should be viewed as partners in this effort, working towards two very specific 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 between when EPA has primacy and when the state has primacy, including interim primacy, for the rule. In order to accomplish these goals and to ensure proper health protection, education, training, and technical assistance will need to be provided to water suppliers explaining their responsibilities under the GWR. Water suppliers are also encouraged to refer to the GWR guidance materials, reference guide, and fact sheets listed in section 2.

Example 4-1. Example Extension Request Checklist

{Date}

{Regional Administrator}
Regional Administrator
U.S. EPA Region **{Region}**
{Street Address}
{City, State, Zip}

RE: Request/approval for an Extension Agreement

Dear **{Regional Administrator}**:

The State of **{State}** is requesting an extension to the date that final primacy revisions are due to EPA for the Ground Water Rule (GWR) until **{insert date - no later than November 8, 2010}**, as allowed by 40 CFR 142.12, and would appreciate your approval. Staff of the **{State Department/Agency}** have conferred with your staff and have agreed to the requirements listed below for this extension. This extension is being requested because the State of **{State}**:

☐ Is planning to group two or more program revisions into a single legislative or regulatory action.
☐ Currently lacks the legislative or regulatory authority to enforce the new or revised requirements.
☐ Currently lacks adequate program capability to implement the new or revised requirements.

{State Department/Agency} will be working with EPA to implement the GWR within the scope of its current authority and capability, as outlined in the six areas identified in 40 CFR 142.12(b)(3)(i-vi):

i) Informing public water systems (PWSs) of the new EPA (and upcoming state) requirements and the fact that EPA will be overseeing implementation of the requirements until EPA approves the state revision.

State	EPA	
____	____	Provide copies of regulation and guidance to other state agencies, PWSs, technical assistance providers, associations, or other interested parties.
____	____	Educate and coordinate with state staff, PWSs, the public, and other water associations about the requirements of this regulation.
____	____	Notify affected systems of their requirements under the GWR.
____	____	Other:

ii) Collecting, storing, and managing laboratory results, public notices, and other compliance and operation data required by the EPA regulations.

State	EPA	
____	____	Devise a tracking system for PWS reporting pursuant to the GWR.
____	____	Keep PWSs informed of reporting requirements during development and implementation.
____	____	Report GWR violation and enforcement information to SDWIS as required.
____	____	Other:

iii) Assisting EPA in the development of the technical aspects of the enforcement actions and conducting informal follow-up on violations (telephones calls, letters, etc.).

State	EPA	
____	____	Issue notices of violation (NOVs) for treatment technique and monitoring/ reporting violations of the GWR.

____ ____ Provide immediate technical assistance to PWSs with treatment technique, MCL and/or monitoring/reporting violations to try to bring them into compliance.
____ ____ Refer all violations to EPA for enforcement if they have not been resolved within 60 days of the incident that triggered the violation. Provide information as requested to conduct and complete any enforcement action referred to EPA.
____ ____ Other:

iv) Providing technical assistance to PWSs.

State EPA
____ ____ Conduct training within the state for PWSs on GWR requirements.
____ ____ Provide technical assistance through written and/or verbal correspondence with PWSs.
____ ____ Provide on-site technical assistance to PWSs as requested and needed to ensure compliance with this regulation.
____ ____ Coordinate with other technical assistance providers and organizations to provide accurate information and aid in a timely manner.
____ ____ Other:

v) Providing EPA with all information prescribed by the State Reporting Requirements in 40 CFR 142.15.

State EPA
____ ____ Report any violations incurred by PWSs for this regulation each quarter.
____ ____ Report any enforcement actions taken against PWSs for this regulation each quarter.
____ ____ Report any variances or exemptions granted for PWSs for this regulation each quarter.
____ ____ Other:

vi) For states whose request for an extension is based on a current lack of program capability to implement the new or revised requirements, taking the following steps to remedy the capability deficiency.

State EPA
____ ____ Acquire additional resources to implement these regulations (list of specific steps being taken attached as {**List A**}).
____ ____ Provide quarterly updates describing the status of acquiring additional resources.
____ ____ Other:

I affirm that the **{State Department/Agency}** will implement provisions of the GWR as outlined above.

_____
{Agency Director or Secretary} Date

_____
{Name of State Agency}

I have consulted with my staff and approve your extension for the aforementioned regulation. I affirm that EPA Region **{Region}** will implement provisions of the GWR as outlined above.

_____
Regional Administrator Date
EPA Region **{Region}**

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

4.3 State Primacy Package

The Primacy Revision Application package should consist of the following sections:

- ☐ State Primacy Revision Checklist
- ☐ Text of the State's Regulations
- ☐ Primacy Revision Crosswalk
- ☐ State Reporting and Recordkeeping Checklist
- ☐ Special Primacy Requirements
- ☐ Attorney General's Statement of Enforceability

4.3.1 The State Primacy Revision Checklist [40 CFR 142.12(c)(1)]

This section is a checklist of general primacy requirements, as shown in Table 4-2. In completing this checklist, the state must identify the program elements that it has revised in response to new federal requirements. **If an element has been revised, the state should indicate a "Yes" answer in the "Revision to State Program" column and should submit appropriate documentation**. For elements that did not require revision, the state need only list the citation and date of state adoption in the "Revision to State Program" column. During the application review process, EPA will insert findings and comments in the final column.

The 1996 SDWA Amendments include new provisions for PWS definition and administrative penalty authority. States must adopt provisions at least as stringent as these new provisions, now codified at 40 CFR 142.2 and 40 CFR 142.10. Failure to revise these elements can affect primacy for the GWR.

States must have primacy or interim primacy for all existing regulations before they can receive primacy for this regulation. States may bundle the primacy revision packages for multiple rules. If states choose to bundle requirements, the Attorney General's Statement should reference all of the rules included.

Table 4-2. State Primacy Revision Checklist

Required Program Elements		Revision to State Program	EPA Findings/Comments
§142.10	Primary Enforcement – Definition of Public Water System*		
§142.10(a)	Regulations No Less Stringent		
§142.10(b)(1)	Maintain Inventory		
§142.10(b)(2)	Sanitary Survey Program		
§142.10(b)(3)	Laboratory Certification Program		
§142.10(b)(4)	Laboratory Capability		
§142.10(b)(5)	Plan Review Program		
§142.10(b)(6)(i)	Authority to apply regulations		

Required Program Elements		Revision to State Program	EPA Findings/Comments
§142.10(b)(6)(ii)	Authority to sue in courts of competent jurisdiction		
§142.10(b)(6)(iii)	Right of Entry		
§142.10(b)(6)(iv)	Authority to require records		
§142.10(b)(6)(v)	Authority to require public notification		
§142.10(b)(6)(vi)	Authority to assess civil and criminal penalties		
§142.10(b)(6)(vii)	Authority to require CWSs to provide CCRs		
§142.10(c)	Maintenance of Records		
§142.10(d)	Variance/Exemption Conditions (if applicable)**		
§142.10(e)	Emergency Plans		
§142.10(f)	Administrative Penalty Authority*		
§142.10(g)	Electronic Reporting Regulations***		

* New requirement from the 1996 Amendments. Regulations published in the April 28, 1998 *Federal Register*.

** New regulations published in the August 14, 1998 *Federal Register*.

*** New regulations published in the October 13, 2005 *Federal Register*.

4.3.2 Text of the State's Regulation

Each primacy application package should include the appropriate text of the state's regulations.

4.3.3 Primacy Revision Crosswalk

The Primacy Revision Crosswalk, in Appendix A, should be completed by states in order to identify state statutory or regulatory provisions that correspond to each federal requirement. If the state's provisions differ from federal requirements, the state should explain how its requirements are "no less stringent."

4.3.4 State Reporting and Recordkeeping Checklist [40 CFR 142.14 and 40 CFR 142.15]

The GWR adds 10 new state recordkeeping requirements and three new state reporting requirements.

The state should use the Primacy Revision Crosswalk in Appendix A to demonstrate that state reporting and recordkeeping requirements are no less stringent than federal requirements. If state requirements are not the same as federal requirements, the state must explain how its requirements are "no less stringent" as required under 40 CFR 142.10.

The Primacy Revision Crosswalk includes state recordkeeping requirements [40 CFR 142.14(d)(17)(i) - (d)(17)(x)] indicating that the state must maintain:

- Records of written notice of significant deficiencies. [40 CFR 142.16(o)(2)(v)]

- Records of corrective action plans and schedule approval or state-specified interim measures. [40 CFR 141.403(a)(5)(ii)]

- Records of confirmation under 40 CFR 141.403(a) that a significant deficiency has been corrected or the fecal contamination in the ground water source has been addressed. [40 CFR 142.16(o)(4)]

- Records of state determinations and records of GWSs' documentation for not conducting triggered source water monitoring. [40 CFR 141.402(a)(5)]

- Records of invalidation of fecal indicator-positive source water samples. [40 CFR 141.402(d)]

- Records of state approvals of source water monitoring plans. [40 CFR 141.402(a)(2)(ii)]

- Records of notices of the minimum residual disinfection concentration (when using chemical disinfection) needed to achieve at least 4-log virus inactivation before or at the first customer. [40 CFR 142.16(o)(4)(ii)]

- Records of notice of the state-specified monitoring and compliance criteria (when using membrane filtration or alternative treatment) needed to achieve at least 4-log treatment of viruses (using inactivation, removal, or a state-approved combination of 4-log inactivation and removal) before or at the first customer. [40 CFR 142.16(o)(4)(iv) and 40 CFR 142.16(o)(4)(v)]

- Records of written notices from the GWS that it provides at least 4-log treatment of viruses (using inactivation, removal, or a state-approved combination of 4-log virus inactivation and removal) before or at the first customer for a ground water source. [40 CFR 141.403(b)(1) and 40 CFR 141.403(b)(2)]

- Records of written determination that a GWS may discontinue 4-log treatment of viruses (using inactivation, removal, or a state-approved combination of 4-log inactivation and removal). [40 CFR 142.16(o)(4)(vi)]

The Primacy Revision Crosswalk includes requirements [40 CFR 142.15(c)(7)(i) - (c)(7)(iii)] indicating that the state must report:

- For each GWS, the month and year in which the most recent sanitary survey was completed or, for a state that uses a phased review process, the date the last element of the eight elements was evaluated. [40 CFR 142.16(o)(2)]

- For GWSs that must meet a treatment technique requirement, the date the system completed the corrective action. [40 CFR 141.403(a)]

- All GWSs providing at least 4-log treatment of viruses (using inactivation, removal, or a state-approved combination of 4-log virus inactivation and removal) before or at the first customer for any ground water source(s). [40 CFR 141.403(b)]

4.3.5 Special Primacy Requirements [40 CFR 142.16]

Special primacy conditions pertain to specific regulations where implementation of the rule involves activities beyond general primacy provisions. States must include these rule-distinct provisions in an application for approval or revision of their program. The Special Primacy Requirements section of the crosswalk is where the state has the opportunity to describe how it will satisfy these provisions. Section 4.4 provides guidance on how states may choose to meet the Special Primacy Requirements of the GWR.

4.3.6 Attorney General's Statement of Enforceability [40 CFR 142.12(c)(2)]

The complete and final primacy revision application must include an Attorney General's Statement certifying that the state regulations were duly adopted and are enforceable (unless EPA has waived this requirement by letter to the state). The Attorney General's Statement should also certify that the state does not have any audit privilege or immunity laws or, if it has such laws, that these laws do not prevent the state from meeting the requirements of the SDWA. If a state has submitted this certification with a previous revision package, then the state should indicate the date of submittal and the Attorney General need only certify that the status of the audit laws has not changed since the prior submittal. An example of an Attorney General's Statement is presented in Example 4-2.

Example 4-2. Example of Attorney General's Statement

Model Language

I hereby certify, pursuant to my authority as (1) and in accordance with the Safe Drinking Water Act as amended, and (2), that in my opinion the laws of the [State/Commonwealth of (3)] [or tribal ordinances of (4)] to carry out the program set forth in the "Program Description" submitted by the (5) have been duly adopted and are enforceable. The specific authorities provided are contained in statutes or regulations that are lawfully adopted at the time this Statement is approved and signed and will be fully effective by the time the program is approved.

I. For States with No Audit Privilege and/or Immunity Laws

Furthermore, I certify that [State/Commonwealth of (3)] has not enacted any environmental audit privilege and/or immunity laws.

II. For States with Audit Laws that do Not Apply to the State Agency Administering the Safe Drinking Water Act

Furthermore, I certify that the environmental [audit privilege and/or immunity law] of the [State/Commonwealth of (3)] does not affect the ability of (3) to meet enforcement and information gathering requirements under the Safe Drinking Water Act because the [audit privilege and/or immunity law] does not apply to the program set forth in the "Program Description." The Safe Drinking Water Act program set forth in the "Program Description" is administered by (5); the [audit privilege and/or immunity law] does not affect programs implemented by (5), thus the program set forth in the "Program Description" is unaffected by the provisions of [State/Commonwealth of (3)] [audit privilege and/or immunity law].

III. For States with Audit Privilege and/or Immunity Laws that Worked with EPA to Satisfy Requirements for Federally Authorized, Delegated, or Approved Environmental Programs

Furthermore, I certify that the environmental [audit privilege and/or immunity law] of the [State/Commonwealth of (3)] does not affect the ability of (3) to meet enforcement and information gathering requirements under the Safe Drinking Water Act because [State/Commonwealth of (3)] has enacted statutory revisions and/or issued a clarifying Attorney General's Statement to satisfy requirements for federally authorized, delegated, or approved environmental programs.

Seal of Office

_____
Signature

_____
Name and Title

_____
Date

(1) State Attorney General or attorney for the primacy agency if it has independent legal counsel.
(2) 40 CFR 142.11(a)(6)(i) for initial primacy applications or 40 CFR 142.12(c)(1)(iii) for primacy program revision applications.
(3) Name of state or commonwealth.
(4) Name of tribe.
(5) Name of primacy agency.

4.3.6.1 Guidance for States on Audit Privilege and/or Immunity Laws

In order for EPA to properly evaluate the state's request for approval, the State Attorney General or independent legal counsel should certify that the state's environmental audit immunity and/or privilege and immunity law does not affect its ability to meet enforcement and information gathering requirements under SDWA. This certification should be reasonably consistent with the wording of the state audit laws and should demonstrate how state program approval criteria are satisfied.

EPA will apply the criteria outlined in its "Statement of Principles" memo issued on February 14, 1997, (www.epa.gov/epaoswer/hazwaste/state/policy/policies.htm) to determine whether states with audit laws have retained adequate enforcement authority for any authorized federal programs. The principles articulated in the guidance are based on the requirements of federal law, specifically the enforcement and compliance and state program approval provisions of environmental statutes and their corresponding regulations. The Principles provide that if provisions of state law are ambiguous, it will be important to obtain opinions from the State Attorney General, or independent legal counsel, interpreting the law as meeting specific federal requirements. If the law cannot be so interpreted, changes to state laws may be necessary to obtain federal program approval. Before submitting a package for approval, states with audit privilege and/or immunity laws should initiate communications with appropriate EPA regional offices to identify and discuss the issues raised by the state's audit privilege and/or immunity law.

The guidance for states on Audit Law Privilege and/or Immunity Laws is currently under review. If amended, EPA will issue an addendum to this document with the revised guidance.

4.4 Guidance for the Special Primacy Requirements of the GWR

In addition to adopting basic primacy requirements specified in 40 CFR 142, states are required to adopt primacy provisions pertaining to specific regulations where implementation of the rule involves activities beyond general primacy provisions. The purpose of these provisions is to allow state flexibility in implementing a regulation that: (1) applies to specific system configurations within the particular state; and, (2) can be integrated with a state's existing PWSS Program. States must include these rule-distinct provisions in an application for approval or revision of their programs. This section contains information and guidance that states can use when addressing the Special Primacy Requirements of the GWR. The guidance addresses Special Primacy Conditions in the same order that they occur in the rule. In the state

primacy revision application packages, the state must explain how it intends to accomplish the requirements of 40 CFR 142.16.

Note: EPA has included the appropriate text from the GWR at the beginning of each subsection.

4.4.1 Special Primacy Requirement Regarding Legal Authority to Ensure GWSs Conduct Source Water Monitoring

40 CFR 142.16 Special primacy requirements. (o) (1) Legal authority. The application for primacy must demonstrate the State has: (i) The authority contained in statute or regulation to ensure that GWSs conduct source water monitoring under 40 CFR 141.402(a)(2), 40 CFR 141.402(a)(3) and 40 CFR 141.402(a)(4)(ii)(A).

Guidance

This Special Primacy Requirement addresses a state's rules or other authority to ensure a GWS conducts monitoring at its ground water source(s) for a fecal indicator in response to a total coliform-positive sample result obtained in compliance with the TCR. This requirement also addresses the state's authority to require a GWS to collect five additional source water samples from a ground water source that has a fecal indicator-positive test result. In addition, this primacy requirement addresses the state's authority to require a wholesale system to test its ground water source(s) for a fecal indicator in response to a total coliform-positive result obtained in compliance with the TCR by a consecutive system that receives water from that wholesale system.

In response to this primacy requirement the state should demonstrate it has the authority to require GWSs to comply with the requirements of 40 CFR 141.402(a)(2), 40 CFR 141.402(a)(3) and 40 CFR 141.402(a)(4)(ii)(A). States that adopt the federal GWR by reference can make this demonstration by showing they have adopted the federal rule. In addition, the state may provide an explanation for its choice of fecal indicator. States may want to refer to regional groundwater occurrence studies or applicable studies comparing the presence of indicators under various wellhead or hydrogeological conditions. A state should also consider the availability of laboratories that can perform the GWR EPA-approved analytical method for the fecal indicator(s) selected.

For those states that do not adopt the federal GWR by reference, this primacy requirement may be satisfied by a description of statutes, rules, and other authorities the state can use to ensure GWSs collect the necessary samples in accordance with 40 CFR 141.402(a)(2), 40 CFR 141.402(a)(3) and 40 CFR 141.402(a)(4)(ii)(A). States must also have the authority to specify the microbial methods listed in 40 CFR 141.402(c) that will apply, depending on which fecal indicators are selected. The appropriate section(s) of each source of authority should be cited and copies of the written documents should be included in the program revision application package.

4.4.2 Special Primacy Requirement Regarding Legal Authority to Ensure GWSs Address Significant Deficiencies

40 CFR 142.16 Special primacy requirements. (o) (1) Legal authority. The application for primacy must demonstrate the State has: (ii) The authority contained in statute and regulation to ensure that GWSs take the appropriate corrective actions including interim measures, if necessary, needed to address significant deficiencies.

Guidance

States that adopt the federal GWR by reference can make this demonstration by showing they have adopted the federal rule (i.e., 40 CFR 141.403). For those not adopting by reference, this Special Primacy Requirement may be satisfied by a description of statutes, rules, and other authority the state can use to ensure GWSs take action necessary to address significant deficiencies as required in 40 CFR 141.403. The appropriate section(s) of each source of authority must be cited and copies of the written documents must be included in the revision application package.

In addition, states may wish to address their authority to take administrative or legal actions and assess penalties. Also, states may wish to include a description of how the appropriate rules or other authority, including formal enforcement actions, will be used to ensure that the GWSs take the steps necessary to correct significant deficiencies.

EPA believes many states have existing authorities that are adequate to comply with the intent of this Special Primacy Requirement. These authorities can often be found in broad statutory language designed to provide public health protection. However, EPA does not believe that the state's existing authority to address imminent and substantial endangerment is sufficient to meet this Special Primacy Requirement. The authority must be specific enough to allow the state to require correction of conditions that have the potential for causing the introduction of contamination into the water delivered to consumers.

Some states may wish, in the rule-making process, to specifically identify significant deficiencies and provide authority to require correction of each. This has the added benefit of establishing a transparent process that ensures the state's administrative procedures requirements are met.

4.4.3 Special Primacy Requirement Regarding Legal Authority to Ensure GWSs Address Source Water Fecal Contamination

40 CFR 142.16 Special primacy requirements. (o) (1) Legal authority. The application for primacy must demonstrate the State has: (iii) The authority contained in statute and regulation to ensure that GWSs take the appropriate corrective actions, including interim measures, if necessary, to address any source water fecal contamination identified during routine or triggered source water monitoring.

Guidance

This Special Primacy Requirement addresses a state's rules or other authority to ensure a GWS responds to fecal contamination (identified during source water monitoring that has been triggered by a total coliform-positive sample result obtained in compliance with the TCR or additional source water monitoring).

States that adopt the federal GWR by reference, can make this demonstration by showing they have adopted the federal rule (i.e., 40 CFR 141.403). For others, this primacy requirement can be satisfied by a description of statutes, rules, and other authorities the state can use to ensure PWSs take the necessary actions appropriate for the nature and severity of the problem. The appropriate section(s) of each source of authority must be cited, copies of the written documents must be included in the program revision application package, and the authority must be equivalent to that provided in 40 CFR 141.403 of the GWR.

In their applications, states may also wish to address their authority to take administrative or legal actions and assess penalties. In addition, states may want to include a description of how they will use their appropriate rules or other authorities to achieve the desired actions on the part of GWSs.

4.4.4 Special Primacy Requirement Regarding Legal Authority to Ensure GWSs Consult with the State Prior to Implementing Corrective Action

40 CFR 142.16 Special primacy requirements. (o) (1) Legal authority. The application for primacy must demonstrate the State has: (iv) The authority contained in statute or regulation to ensure that GWSs consult with the State regarding corrective action(s).

Guidance

This Special Primacy Requirement addresses a state's rules or other authority to ensure a system with significant deficiencies or source water fecal contamination consults with the state prior to taking corrective action as required by 141.403(4). Systems and states should have the flexibility and authority to determine and require the most appropriate corrective action to address site-specific conditions.

This consultation is intended to allow the state the ability to provide an initial review and engage in a discussion with the system to ensure that, when appropriate, state plan review/permitting requirements are met and corrective actions are conducted that are appropriate and protective of public health.

States that adopt the federal GWR by reference can demonstrate authority to require consultation by showing they have adopted the federal rule (i.e., 141.403). For others, this primacy requirement can be satisfied by a description of statutes, rules, and other authorities the state can use to ensure GWSs consult with the state before implementing corrective actions. The appropriate section(s) of each source of authority must be cited and copies of the written documents must be included in the program revision application package. States should also determine if they have existing authority to require GWSs to, not only consult, but to make corrective actions deemed appropriate by the state. If they do not have such authority, they should address it in their rule-making process.

In their applications, states may also wish to address their authority to take administrative or legal actions and assess penalties. In addition, states may include a description of the plan for using their appropriate rules or other authority to achieve the desired actions on the part of PWSs.

4.4.5 Special Primacy Requirements Regarding Sanitary Surveys

40 CFR 142.16 Special primacy requirements. (o) (2) State practices or procedures for sanitary surveys. In addition to the general requirements for sanitary surveys contained in 40 CFR 142.10(b)(2) a primacy application must describe how the State will implement a sanitary survey program that meets the requirements of paragraph (o)(2)(i) of this section.

Guidance

The Special Primacy Requirements of 40 CFR 142.16(o)(2) describe several additional provisions states must apply to their sanitary survey programs for GWSs. These provisions address the aspects of GWSs that must be evaluated during the sanitary survey, minimum frequencies for conducting the sanitary surveys, and identification of "significant deficiencies" that require immediate corrective action. It also offers states the flexibility to reduce the frequency of sanitary surveys necessary for CWSs with 4-log virus treatment or those deemed by the state to have outstanding performance and to conduct sanitary surveys in a phased or staged manner.

The following guidance addresses each subsection of 40 CFR 142.16(o)(2)(i) through (v) in order; however, the arrangement and structure of the state's description are discretionary provided the state gives sufficient detail to demonstrate that its strategy and capacity are adequate for meeting the Special Primacy Conditions. For more detailed guidance see *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, April 1999). Available from the Safe Drinking Water Hotline (800) 426-4791 and at www.epa.gov/safewater/mdbp/pdf/sansurv/sansurv.pdf.

4.4.5.1 Frequency and scope of sanitary surveys

(i): The state must conduct sanitary surveys for all GWSs that address the eight sanitary survey components listed in this section no less frequently than every 3 years for community water systems and every 5 years for non-community water systems. The state may conduct more frequent sanitary surveys for any system. The initial sanitary survey for community water systems must be conducted by December 31, 2012 and the initial sanitary survey for non-community water systems must be conducted by December 31, 2014. For the purposes of this paragraph, a "sanitary survey," as conducted by the state, includes but is not limited to an onsite review of the water source (identifying sources of contamination by using results of source water assessments or other relevant information where available), facilities, equipment, operation, maintenance, and monitoring compliance of a public water system to evaluate the adequacy of the system, its sources and operations and the distribution of safe drinking water. The sanitary survey components are listed in (A)-(H).
(A) Source.
(B) Treatment.
(C) Distribution system.
(D) Finished water storage.
(E) Pumps, pump facilities, and controls.
(F) Monitoring, reporting, and data verification.
(G) System management and operation.
(*H) Operator compliance with state requirements.*

Guidance

This Special Primacy Requirement addresses the scope of the state's sanitary surveys (eight components must be included), the minimum frequency for conducting surveys, and the capacity of the state to conduct these required surveys. States should have adequate resources to comply with these requirements. States must address scope and frequency of sanitary surveys in their primacy revision application and are encouraged to address capacity and implementation as well. Some states may have already adopted relevant authority for these requirements when they adopted the Interim Enhanced Surface Water Treatment Rule (IESWTR).

Frequency and scope of sanitary surveys

In a state's description of how it will implement a sanitary survey program, the state should demonstrate that sanitary surveys will address, at a minimum, the eight components listed above. In cases where the state is currently performing sanitary surveys that meet these minimum requirements, example sanitary survey forms and completed reports can be used to demonstrate that all eight elements are addressed. If the state does not believe that it currently performs sanitary surveys that meet the minimum requirements, the revision application should include details of a plan for upgrading the state's procedures, as necessary,

including examples of sanitary survey forms that will be used and a description of training for staff performing sanitary surveys.

The state must show that sanitary surveys will be conducted no less frequently than every 3 years for CWSs that are not providing at least 4-log treatment of viruses and have not been determined by the state to have an outstanding performance record. The state must show that sanitary surveys will be conducted no less frequently than every 5 years for NCWSs and CWSs providing at least 4-log treatment of viruses or that have been determined by the state to have an outstanding performance record. (See section 4.4.5.3.)

In order to ensure these surveys will be an effective preventive tool for identifying and correcting water system deficiencies that could pose a threat to public health, states should conduct surveys 3 (or 5) years from the year the survey was last conducted. Thus, if a sanitary survey for a system on a 3-year cycle is conducted on June 11, 2008, the next survey should be completed by December 2011. EPA encourages more frequent sanitary surveys than stated if that is the current practice, or requirement of the state.

Capacity

The state's revision application should address capacity for conducting appropriate sanitary surveys at, or in excess of, the frequency outlined in 40 CFR 142.16(o)(2)(i). When such capacity exists and the above requirements are being met or exceeded by an existing program, a summary of the state's sanitary survey program, including a brief description of past and future schedules, should be sufficient to demonstrate adequate capacity. The state should also demonstrate that personnel performing the sanitary surveys will have the professional qualifications and training necessary to assure sanitary surveys are conducted by appropriately skilled and adequately trained professionals.

A state that does not have an existing sanitary survey program that meets these requirements should describe its proposed program and estimate the resources directed toward sanitary surveys. The state should explain how the new requirements will affect its program and whether existing resources will be adequate. When existing resources are clearly inadequate, the state should provide EPA with a plan for obtaining additional support before the compliance dates of the rule.

Implementation

Finally, the state should provide EPA with a brief description of its plan for meeting the requirements of 40 CFR 142.16(o)(2)(i) given existing or planned resources, the number of affected GWSs, anticipated follow-up technical assistance and enforcement needs, and other program demands.

4.4.5.2 Phased sanitary survey process

(ii): The state may use a phased review process to meet the requirements of (o)(2)(i) of this section if all the applicable elements of (o)(2)(i)(A) through (H) are evaluated within the required interval.

Guidance

In view of the fact that states often conduct inspections of one or more of the eight components of a sanitary survey as part of program efforts separate from the sanitary surveys, the rule allows for those evaluations and inspections to be used in a staged or phased review process as long as all eight components are addressed within the required frequency. Other programs whose activities may serve to address one or more of the components include:

- Source Water Assessment and Protection Program
- Wellhead Protection Program
- Operator Training and Certification Program
- Technical Assistance Programs
- Capacity Development Programs

In addition, some systems are too large or complex to complete a sanitary survey in a single visit. If a state wishes to conduct sanitary surveys in a staged or phased process, the primacy revision application should contain a description of relevant programs and activities, how they will be coordinated, the timeframe, and who the responsible parties will be for follow-up enforcement in response to deficiencies. A justification is not required if a state chooses not to use the phased approach.

4.4.5.3 Reduced frequency of sanitary surveys for CWSs

(iii): The state may reduce the sanitary survey frequency for a community water system from once every three years to no less frequently than every five years if the community water system either provides at least 4-log treatment of viruses (using inactivation, removal, or state-approved combination of these technologies) before or at the first customer for all its ground water sources, or has an outstanding performance record documented in previous inspections and has no history of total coliform MCL or monitoring violations under 40 CFR 141.21 (Total Coliform Rule) since the last sanitary survey. In its primacy application the state must describe how it will decide whether a community water system has an outstanding performance record.

Guidance

This Special Primacy Requirement allows the state to decrease the frequency of sanitary surveys for some community GWSs from once every 3 years to once every 5 years. The provision is designed to allow states to direct their limited resources toward systems that have the greatest potential for posing public health risks, *i.e.,* those *not* achieving outstanding performance. States must have a procedure for determining whether a system should be considered to have outstanding performance. States should also consider integrating this procedure into the sanitary survey process. The procedure and policy for making these determinations should provide inspectors with enough direction to ensure consistent implementation. The policy should also describe who will make the final decision to reduce survey frequency.

In general, outstanding performance means that a system is well-operated and managed, has a good record of performance in past sanitary surveys, and has not had any violations in recent years. A state's specifications for outstanding performance may include factors such as the following:

- No total coliform MCL violations since the last sanitary survey.

- No violations of total coliform monitoring requirements since the last sanitary survey.

- No violations of primary drinking water regulations during the past 5 years (or similar time period).
- No waterborne disease outbreaks attributable to the water system during a specified period.
- The last sanitary survey contained no significant deficiencies.
- Existence of emergency preparedness measures and backup facilities.
- Expert management of system (e.g., managers are knowledgeable about providing quality drinking water; low staff turnover and positive staff morale; well-established water quality goals).
- Expert operation of the system (e.g., skilled, certified personnel in adequate numbers).
- Existence of quality operations and maintenance (O&M) manuals that are used by the staff.
- Adequate budget and revenues.
- Development and implementation of an effective cross-connection control program.
- Active public outreach programs (e.g., citizen participation committees).
- Stable water source (no interruptions in supply).
- Source water supply drawn from well(s) with sanitary construction, available documentation (e.g. driller's logs), and protected wellhead areas.
- No identified significant risk of future violations or problems (e.g., equipment past its service life).
- System capacity sufficient to meet anticipated growth.
- Participation in and achieving treatment goals of an Area-wide Optimization Program (AWOP) or Partnership for Safe Water.

As noted above, each state should have its own specifications for determining if a system has outstanding performance. The state may choose to use some or all of the above factors, different factors that have been developed by the state, or a combination of both.

4.4.5.4 What constitutes a significant deficiency

(iv): The state must describe in its primacy application what constitutes a significant deficiency in each of the eight sanitary survey elements in paragraphs (o)(2)(i)(A) through (H) of this section.

Guidance

During sanitary surveys, inspectors often discover a wide range of deficiencies. Some are minor and have little near-term potential to pose risks to public health or safety. At the other end of the spectrum are

deficiencies that provide the near-term potential for drinking water to be unsafe or the water system to be operated in a manner that threatens the safety of operators or the public. States must establish procedures for inspectors to use to determine the point at which deficiencies become "significant."

The first step in this process is to define what characteristics constitute "significant deficiencies." Many public health professionals believe that any aspect of a GWS (source, transmission, pumping, treatment, storage, distribution, operation, maintenance, management, etc.) that may cause, or have potential to cause, risks to public health or safety should be considered a significant deficiency. EPA does not specify the definition that a state must use; rather, the Agency suggests that states use their best professional judgment and expertise to develop and apply their own definitions.

The second step is for the state to develop a procedure whereby inspectors can evaluate system defects and determine their significance (i.e., whether it meets the state definition of significant deficiency). The procedure could begin with questions to be asked about each defect. As much as possible, states are encouraged to develop technically specific definitions of significant deficiencies. A few more general examples (*not intended to be complete*) of questions that may help inspectors in making determinations are the following:

- Is there the potential for contaminants to be introduced to the drinking water due to the deficiency?
- Would the conditions causing the deficiency be a violation of current state design, treatment, or operating standards?
- 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?

The GWR requires states to define in their primacy applications at least one significant deficiency in each of the eight sanitary survey elements (see subsection Examples of possible significant deficiencies). A description of each significant deficiency identified in the primacy package should also be included. States are encouraged to go beyond the minimum Special Primacy Requirement of providing at least one specific significant deficiency in each of the eight sanitary survey elements, and develop a more comprehensive list of deficiencies that meet the definition of "significant" that require immediate corrective actions. Such a list may be modified over time based upon state experience, and it is not likely that all deficiencies will be identified. By establishing its own definition of a significant deficiency and a list of what deficiencies it considers significant, a state provides consistency throughout all surveys and among inspectors.

Table 4-3 illustrates one possible approach to categorizing some of the common deficiencies by the degree of their threat to public health. The list below includes examples of deficiencies that may be considered significant public health issues. This list is not intended to be comprehensive, but serves as a guide to states for categorizing significant deficiencies. Other deficiencies could be deemed significant public health issues.

Table 4-3. Example Sanitary Survey Deficiencies

(This table is for illustrative purposes only and does not represent federal or state policy)

Finding	Minor	Moderate	Significant
No approved construction drawings		X	
Failure to update the water distribution map	X		
Stopping work on system improvements (when stopping work is not the prudent and reasonable approach)		X	
Loss of distribution system pressure for an extended period of time			X
Failure to meet water treatment requirements			X
Failure to meet water quality MCLs			X
System continues to operate in a noncompliance mode			X
Operating in excess of the maximum number of service connections allowed		X	
System not operating in compliance with water system plan		X	

Examples of possible significant deficiencies

The following are examples, organized by each of the eight sanitary survey elements, of deficiencies that states may consider to be significant and require immediate corrective action. (The list is not intended to be complete.)

- Source
  - Not having a secured protective radius around a well.
  - Wells of improper construction.

- Treatment
  - Chemical feed rates not adjusted for changes in flow rate.
  - Inadequate disinfection CT.
  - Inadequate application of treatment chemicals.

- Distribution Systems
  - TCR sampling plan not representative of distribution system.
  - Negative pressures at any time.
  - Inadequate cross connection controls, either at the treatment facility or in the distribution system (or failure to have a cross connection control program, when one is required).
  - Unacceptable system leakage that could result in entrance of contaminants.

- 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).
  - Uncovered finished water reservoir.

- Pumps/Pump Facilities and Controls
  - Ponding of water in pump housing.
  - Inadequate pump capacity.

- Monitoring/Reporting/Data Verification
  - Failure to properly monitor water quality.
  - 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 approved emergency response plan.
  - Failure to meet water supply demands/interruptions to service (inadequate pump capacity, unreliable water source, lack of auxiliary power).
  - Inadequate follow-up to deficiencies noted in previous inspection/sanitary surveys.

- Operator Compliance with State Requirements
  - Operator does not have the correct level of certification as required by the state.

States should make this information available to inspectors performing the sanitary surveys so they can have guidelines available on which deficiencies meet the state's definition of significant. Inspectors can also use their state's definition of "significant deficiency" as guidance when they encounter other deficiencies that may pose a serious public health threat.

If the state determines that a significant public health issue exists, corrective action must be required. State inspectors may judge other problems as significant enough from a public health viewpoint to require establishment of a compliance schedule with follow-up action.

References for more detailed guidance

Guidance Manual for Conducting Sanitary Surveys of Public Water Systems; Ground Water. [Under Development]

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). Available at www.epa.gov/safewater/mdbp/pdf/sansurv/sansurv.pdf and from the Safe Drinking Water Hotline. (800) 426-4791.

How to Conduct a Sanitary Survey of Small Water Systems, University of Florida Training, Research and Education for Environmental Occupations Center (developed under EPA Training Grant T902854), 1998. Available from the National Environmental Training Association, (602) 956-6099.

State Sanitary Survey Resource Directory, AKA *EPA/State Joint Guidance on Sanitary Surveys*, Association of State Drinking Water Administrators, 1995. Available from the Safe Drinking Water Hotline, (800) 426-4791.

4.4.5.5 Notice to system of significant deficiencies

(v): The state must provide GWSs with written notice describing any significant deficiencies no later than 30 days after the state identifies the significant deficiency. The notice may specify corrective actions and deadlines for completion of corrective actions.

Guidance

States must describe their process of how they will inform systems of identified significant deficiencies. The GWR requires states to provide GWSs with written notice describing any significant deficiencies no later than 30 days after the state identifies the significant deficiency. If the significant deficiency is identified during a sanitary survey, the state may provide the written notice at the time of the sanitary survey. For example, some states use forms that are completed during the sanitary survey identifying significant deficiencies found during the survey. The forms can be carbon copies; the state inspector and water system representative should both sign the form at the end of the sanitary survey, and each person should receive a copy of the signed form. EPA believes such an approach would qualify as written notification for the state and satisfy this notification requirement.

The state may want to notify systems of significant deficiencies in a very brief letter. An example of a letter format that could be used to make this notification is provided in Example 4-3. Since significant deficiencies may present a public health risk to consumers, EPA encourages states to notify systems of a significant deficiency as soon as possible within the allotted 30-day notification period.

Example 4-3. Example Significant Deficiency Notification Letter

State Letterhead

July 21, 2011

James King, Supervisor
and Townsville Town Board
P.O. Box 123
Townsville, ST 12345

RE: Townsville Water District – PWS No. ST1234567

Dear Supervisor King and Town Board Members:

A sanitary survey of the Townsville Water District was conducted on July 17, 2011. I was accompanied on the survey by Water Operator Mr. Alex Green, and was also provided information by Mrs. Jenkins. Their assistance is greatly appreciated. Presented here is a brief description of the system, followed by a summary of my findings from the survey. Action required by the Water District is explained below.

Water System Description: The Townsville Water District serves the central area of the town. The system has 350 service connections and serves an estimated population of 810 people. The only operational source at this time is Well #1, located in the town park. The well has two pumps, each capable of 100 gpm; the well is approved for a daily withdrawal of 150 gpm (216,000 gpd). Chlorine gas (for disinfection) and soda ash (for corrosion control) are added in the treatment building situated adjacent to the well. Most of the distribution system is PVC pipe installed in recent years. One steel storage tank holding 380,000 gallons is located at the north end of the district.

Operation and Maintenance: General operation and maintenance under the direction of Mr. Green has been very good. The system is in compliance with all monitoring and reporting requirements. Lead and copper levels in the system have been acceptable since the soda ash injection was installed.

System Deficiencies: Deficiencies found during the survey are noted below. ***The significant deficiencies must be addressed immediately. Townsville Water District should contact our office within 20 days of receiving this letter to notify us that these significant deficiencies have been addressed.*** Deadlines for addressing the other deficiencies are provided below.

- ***Significant Deficiency:*** The chlorine gas canisters are not secured (chained) in the treatment chamber. They must be chained and secured.
- ***Significant Deficiency:*** The treatment plant that houses the chlorine gas and soda ash is not locked. A lock must be installed so the public cannot enter the treatment plant.
- ***Significant Deficiency:*** Full chlorine gas canisters are stored outside the treatment building in an area that is accessible to the public. The full canisters must be stored in a secure chamber with proper sensors, ventilation, and alarm.
- Deficiency: The source water meter is not working. It should be repaired or replaced within 6 months.
- Deficiency: The cage on the ladder of the storage tank is broken. It should be repaired within 6 months.
- Deficiency: The storage tank has not been drained and cleaned in over 15 years. Customer taste and odor complaints, as well as a significant drop in the chlorine residual in water leaving the storage tank, suggest there may be silt in the tank that needs to be removed. The tank should be cleaned before the next sanitary survey (in three years).

Enclosed are forms that summarize the information and document the findings described in this report. If you have any questions about this report, or your water system in general, please contact our office.

Sincerely,

Jill Smith

Jill Smith, P.E.
Senior Sanitary Engineer

Enclosures
cc: Mr. Alex Green
Mrs. Jenkins
State Health Department Central Office

4.4.6 Special Primacy Requirements Regarding Routine Source Water Microbial Monitoring

40 CFR 142.16 Special primacy requirements. (o)(3) State practices or procedures for source water microbial monitoring. The state's primacy application must include a description of the following:

Guidance

The Special Primacy Requirements of 40 CFR 142.16(o)(3) address the rationales the state used when determining source water monitoring criteria.

The following guidance addresses each subsection of 40 CFR 142.16(o)(3)(i) through (iv) in order; however, the arrangement and structure of the state's description are discretionary provided the state gives sufficient detail to demonstrate that its strategy and capacity are adequate for meeting the Special Primacy Conditions.

4.4.6.1 Extending 24-hour time limit to collect triggered source water sample

(i): Criteria that will be used under 40 CFR 141.403(a)(2)(i) and 141.402(d)(2) for extending the 24-hour time limit for a system to collect a ground water source sample to comply with the source water monitoring requirements.

Guidance

In this Special Primacy Requirement, states must address allowable situations that would prevent a GWS from collecting a required triggered source water sample within the 24-hour time limit. Factors may include lab availability (e.g., lab closed on the weekend) and mail service. States may allow a delay in triggered source water sampling when an extreme condition or circumstance would put the sample collector in danger (e.g., severe weather conditions) or the delay cannot be avoided. If additional time is allowed for sampling, the system should sample as close to the 24-hour window as possible. EPA suggests that states require systems to call for pre-approval of the delay.

4.4.6.2 Total coliform-positive sample solely the result of a distribution system deficiency

(ii): Criteria that will be used under 40 CFR 141.402(a)(5) and 141.402(a)(5)(ii) to determine whether the cause of a total coliform-positive sample taken under 40 CFR 141.21 (Total Coliform Rule) is directly related to the distribution system.

Guidance

Triggered source water monitoring is required after a total coliform-positive sample is collected from the distribution system in compliance with the TCR. A GWS may not be required to comply with the triggered source water monitoring requirement if the GWS provides documentation to the state within 30 days of the total coliform-positive sample that it met the state criteria for distribution system conditions that cause total coliform-positive samples. In addition the state can determine that a total coliform-positive sample collected under the TCR was caused by a distribution system deficiency. To meet this Special Primacy Requirement, states must describe the criteria that will be used to determine whether a total coliform-positive sample taken under the TCR is directly related to the distribution system. States may consider that samples constitute documentation of a distribution system deficiency. For example, follow-up distribution sampling or system repair records may be useful.

Some examples are:

- If the water system is known to have recurring documented biofilm problems and the total coliform-positive sample is convincingly related to biofilm growth in the distribution system;
- After a storage tank inspection where contamination is evident;
- After main repair or repair of a storage tank;
- In a zone of the distribution system where water pressure is negative or low (e.g., less than 20 psi); or,
- When it is likely that contamination is the result of a cross connection in the distribution system.

The reasons for triggered source water samples not being taken should be valid and defensible, and past distribution system problems supporting the total coliform-positive result should have been documented before the positive coliform sample result was received. For example, if a system attributes a positive total coliform result to a cross connection, the cross connection should have been previously identified and documented in writing before the positive total coliform sample was collected. In such a case, EPA recommends that a plan be put in place to address cross connection problems.

4.4.6.3 Invalidation of fecal indicator-positive samples

(iii): Criteria for determining whether to invalidate a fecal indicator-positive sample under 40 CFR 141.402(d)(1).

Guidance

For this Special Primacy Requirement, states must describe criteria they will use to determine whether a fecal indicator-positive sample does not reflect the true source water quality and should therefore be invalidated. Criteria may not be based solely on a belief that improper sample collection procedures were used. Suspected improper sample collection procedures should not be considered adequate cause because a sample collector handling error would not be expected to cause fecal contamination.

States must use the provisions for sample invalidation criteria reported in the TCR at 40 CFR 141.21(c). In summary, these criteria are:

- If the laboratory establishes that improper sample analysis caused the fecal indicator-positive result.
- If the state has substantial grounds to believe that a fecal indicator-positive result is due to a circumstance or condition that does not reflect water quality in the ground water source. In this case, the system must collect another source water sample within 24 hours of being notified by the state of its invalidation decision, and have that sample analyzed for the same fecal indicator that was analyzed in the invalidated sample. The state may extend the 24-hour time limit on a case-by-case basis if the system cannot collect the source water sample within 24 hours due to circumstances beyond its control. In the case of an extension, the state must specify how much time the system has to collect the sample.

- The state should document its decision to invalidate a sample, along with the rationale for the decision, in writing. The decision should be approved and signed by the supervisor or the state official who recommended the decision, and the document should be made available to EPA and the public. The written documentation should state the specific cause of the fecal indicator-positive sample, and what action was taken by the system in response.

- The state should not invalidate a fecal indicator-positive sample solely on the grounds that repeat samples were fecal indicator negative.

4.4.6.4 Monitoring at a Location After Treatment

(iv): Criteria the State will use to allow source water microbial monitoring at a location after treatment under 40 CFR 141.402(e)(1).

Guidance

Systems must collect source water samples at a location prior to any treatment. The state may, however, allow systems to collect samples after chemical treatment if the state determines that collecting a sample before treatment is not feasible and if the treatment is unlikely to have an adverse effect on sample analysis. In general, any preceding treatment should not interfere with the analytical method used to measure the fecal indicator, nor should the treatment provide any inactivation or removal of the fecal indicator being tested. For example, ground water treatment with greensand filters frequently uses potassium permanganate to oxidize iron and manganese before filtering those metals out. Potassium permanganate may provide some inactivation of, and filtration is likely to remove, viruses and bacteria. Therefore, it would not be appropriate for a system to collect a triggered source water sample after its greensand filters. On the other hand, wells that pump sand are often equipped with sand separators that are unlikely to have an impact on the microbial quality of the water.

States could meet this requirement by stating that sampling locations after treatment will only be allowed if a system meets two conditions are shown to have been met: 1) the treatment will have no impact on microbial quality of the water, and 2) it is not possible to directly sample the untreated water.

4.4.7 Special Primacy Requirements Regarding Treatment Technique Requirements

40 CFR 142.16 Special primacy requirements. (o)(4) State practices or procedures for treatment technique requirements. As a condition of primacy, the State must verify that significant deficiencies or source water fecal contamination have been addressed. The State must verify within 30 days after the GWS has reported to the State that it has completed corrective action. The State must verify either through written confirmation from the GWS or a site visit by the State. Written notice from the GWS under 141.405(a)(2) of this chapter may serve as this verification. The State's primacy application must include the following:

The following guidance addresses each subsection of 40 CFR 142.16(o)(4)(i) through (vi) in order; however, the arrangement and structure of the state's description are discretionary, provided the state gives sufficient detail to demonstrate that its strategy and capacity are adequate for meeting the Special Primacy Conditions.

4.4.7.1 Confirmation of system achieving at least 4-log treatment of viruses

(i): The process the state will use to determine that a GWS achieves at least a 4-log treatment of viruses (using inactivation, removal, or a combination of inactivation and removal) before or at the first customer for a ground water source for systems that are not subject to the source water monitoring requirements of 141.402(a) because the GWS has informed the State that it provides at least 4-log treatment of viruses.

Guidance

The state must explain the criteria that will be used for determining when a GWS has met the 4-log inactivation requirements. The state should be explicit in its explanation as to how it will confirm that systems are achieving 4-log treatment of viruses. Criteria may include determination of the appropriate treatment technology, treatment design and specifications constituting sufficient inactivation and or removal, the minimum contact time required for compliance to be achieved at the minimum disinfectant residual, and submission of records of contact time calculations or records documenting maintenance of a minimum disinfectant residual.

EPA recommends that the state use applicable EPA-developed virus CT (the product of disinfection concentration in mg/L and time in minutes) tables to determine the concentration and contact time requirements necessary to achieve 4-log virus inactivation using chemical disinfection. If alternative criteria will be used by GWSs for compliance, the state must describe the treatment and compliance monitoring basis for the specified 4-log virus inactivation method. The description should include how the state will factor into its determination contact time correction factors (e.g., baffling factors), pH, temperature, flow, and minimal residuals.

While the GWR does not include CT tables for 4-log inactivation of viruses, states are encouraged to consider CT tables developed for the Surface Water Treatment Rule as helpful references when developing minimum disinfection requirements. Table 4-4 provides CT values for inactivation of viruses by free chlorine in waters with pH values falling within the range of 6.0 to 9.0. Table 4-5 provides CT values for inactivation of viruses by chlorine dioxide in waters with pH values falling between 6.0 and 9.0. Table 4-6 provides CT values for inactivation of viruses by ozone. Table 4-7 provides CT values for inactivation of viruses by free chlorine in water with a pH of 10. The CT tables provided in Tables 4-4 through 4-7 have been adapted from tables provided in EPA's *Guidance Manual for Compliance with the Filtration and Disinfection Requirements for Public Water Systems Using Surface Water Sources*, March 1991 Edition. No CT table is provided for chloramines because EPA anticipates that CT values needed to achieve 4-log virus inactivation using chloramines will be prohibitively high for most GWSs.

Table 4-4. CT Values for Inactivation of Viruses by Free Chlorine, pH 6.0-9.0

Degrees C	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Inactivation (log)																									
2	5.8	5.3	4.9	4.4	4.0	3.8	3.6	3.4	3.2	3.0	2.8	2.6	2.4	2.2	2.0	1.8	1.6	1.4	1.2	1.0	1.0	1.0	1.0	1.0	1.0
3	8.7	8.0	7.3	6.7	6.0	5.6	5.2	4.8	4.4	4.0	3.8	3.6	3.4	3.2	3.0	2.8	2.6	2.4	2.2	2.0	1.8	1.6	1.4	1.2	1.0
4	11.6	10.7	9.8	8.9	8.0	7.6	7.2	6.8	6.4	6.0	5.6	5.2	4.8	4.4	4.0	3.8	3.6	3.4	3.2	3.0	2.8	2.6	2.4	2.2	2.0

CT values provided in the tables are modified by linear interpolation between 5°C increments.

Table 4-5. CT Values for Inactivation of Viruses by Chlorine Dioxide, pH 6.0-9.0

Degrees C	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Inactivation (log)																									
2	8.4	7.7	7.0	6.3	5.6	5.3	5.0	4.8	4.5	4.2	3.9	3.6	3.4	3.1	2.8	2.7	2.5	2.4	2.2	2.1	2.0	1.8	1.7	1.5	1.4
3	25.6	23.5	21.4	19.2	17.1	16.2	15.4	14.5	13.7	12.8	12.0	11.1	10.3	9.4	8.6	8.2	7.7	7.3	6.8	6.4	6.0	5.6	5.1	4.7	4.3
4	50.1	45.9	41.8	37.6	33.4	31.7	30.1	28.4	26.8	25.1	23.4	21.7	20.1	18.4	16.7	15.9	15.0	14.2	13.3	12.5	11.7	10.9	10.0	9.2	8.4

CT values provided in the tables are modified by linear interpolation between 5°C increments.

Table 4-6. CT Values for Inactivation of Viruses by Ozone

Degrees C	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Inactivation (log)																									
2	0.90	0.83	0.75	0.68	0.60	0.58	0.56	0.54	0.52	0.50	0.46	0.42	0.38	0.34	0.30	0.29	0.28	0.27	0.26	0.25	0.23	0.21	0.19	0.17	0.15
3	1.40	1.28	1.15	1.03	0.90	0.88	0.86	0.84	0.82	0.80	0.74	0.68	0.62	0.56	0.50	0.48	0.46	0.44	0.42	0.40	0.37	0.34	0.31	0.28	0.25
4	1.80	1.65	1.50	1.35	1.20	1.16	1.12	1.08	1.04	1.00	0.92	0.84	0.76	0.68	0.60	0.58	0.56	0.54	0.52	0.50	0.46	0.42	0.38	0.34	0.30

CT values provided in the tables are modified by linear interpolation between 5°C increments.

Table 4-7. CT Values for Inactivation of Viruses by Free Chlorine, pH 10

Degrees C	0.5	5	10	15	20	25
Inactivation (log)						
2	45	30	22	15	11	7
3	66	44	33	22	16	11
4	90	60	45	30	22	15

States should describe criteria for determining effective contact times provided by typical configurations for hydropneumatic tanks and other storage facilities that GWSs will use to obtain disinfectant contact time. For example, hydropneumatic pressure tanks and storage tanks that ”ride” or “float” on the distribution system should not typically be considered for provision of contact time because the chemically treated water is not obliged to pass through them under all conditions of flow. States should also explain their approach to making baffling factor determinations. Larger GWSs with gravity storage can obtain guidance for determining the effectiveness of chemical disinfection in EPA’s 1991 edition of *Guidance Manual for Compliance with the Filtration and Disinfection Requirements for Public Water Systems Using Surface Water Sources.* Also, Appendix D in EPA’s *Disinfection Profiling and Benchmarking Guidance Manual* (EPA-815-R-99-013, August 1999) provides information on baffling factors, tracer studies and other issues related to determining the amount of disinfectant contact time provided by water systems.

While the above referenced guidance manuals are especially helpful to surface water systems, they should not be expected to provide all the information necessary for GWSs. This is true for a few reasons. First, while both ground and surface water systems are most likely to use free chlorine as a chemical disinfectant, the target organisms of most concern are very different. In the case of surface water systems, the target organism is *Giardia lamblia*. GWSs, on the other hand, target viruses. In comparing the disinfection requirements for two systems with the same temperature (15 degrees C), pH (7) and chlorine residual (1.0 mg/L), the respective CT requirements can be very different. For the surface water system the requirements would be 25 mg/L-min. for 1-log and 75 mg/L-min. for 3-log *Giardia lamblia* inactivation; therefore requiring 25 minutes contact time in one case and 75 minutes in the other. For the GWS the requirement would be 4 mg/L-min. for 4-log virus inactivation. Thus, 4 minutes of contact time. Therefore, while the surface water guidance recommends consideration of a worst-case scenario at daily peak hourly flow, this may not be appropriate for all GWSs.

The second major difference between ground and surface water systems is also related to water production rates. While most surface water plants generally produce water at constant rates and have clearwells to provide contact time, this is not true for many GWSs, particularly the smaller GWSs (i.e., those serving less than 100 people). Small GWSs typically have wells that pump into the distributions system and are equipped with hydropneumatic tanks intended to limit the cycling of the well pumps. For these systems a pressure switch turns the well pump on at a minimum distribution system pressure (e.g., 35 psi), then the well pumps water until an upper pressure is reached, perhaps 65 psi, and the pressure switch turns the pump off. As shown by the example pump curve in Figure 4-2, the flow rate from the well varies greatly as the pressure changes during the pump cycle. At the turn-on pressure of 35 psi, the well production rate is 58 gpm or about 145% of the flow rate at shut-off pressure (65 psi). In a typical small hydropneumatic tank system, the well may often pump at this higher rate for several minutes during peak demand periods. Therefore, it is appropriate for states to consider these momentary peaks in water demand for determining the provisions necessary to ensure adequate contact time.

Figure 4-2. Example Pump Curve for A Ground Water Well

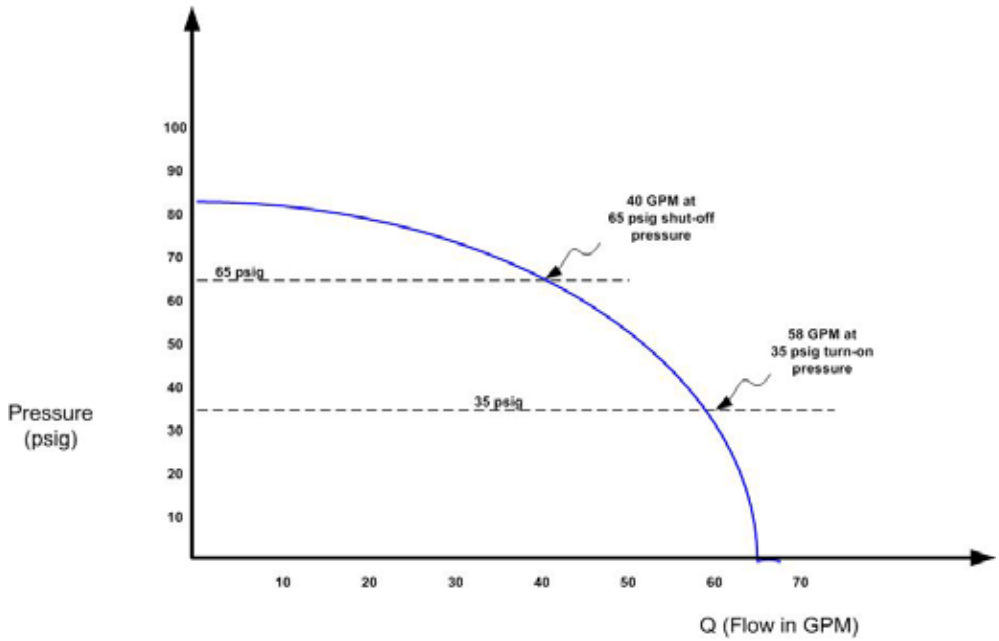
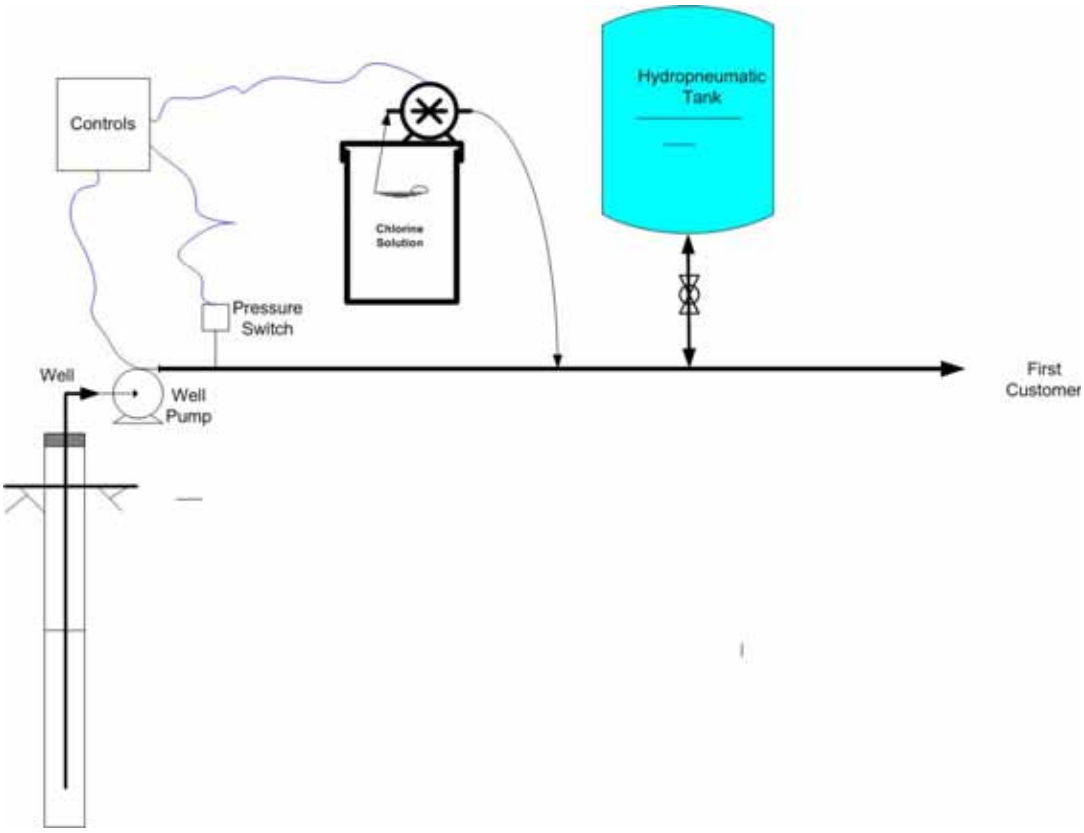


Figure 4-3 shows a schematic drawing of a typical small GWS well equipped with a shallow well pump and a hydropneumatic tank for limiting the pump's cycling. As shown, the chlorine solution is injected into the discharge line ahead of the hydropneumatic tank. However, the volume of the tank cannot be considered for contact time because, when turn-on pressure occurs, the tank is effectively empty. At this point the pump is producing 58 gpm and, during peak demand times, all water will be bypassing the hydropneumatic tank and entering the distribution system to satisfy demand. Therefore, there should be provisions to provide the minimum contact time between the point of chlorine injection and the first customer. In this example, that means a minimum effective volume of 232 gallons (58 gpm X 4 min. = 232 gallons). Assuming the pipe between the discharge chlorine injection point and the first customer is all 2-inch diameter, 1,422 feet of pipe would be necessary to provide 4 minutes of contact time at 58 gpm (i.e., Π (2/12')2/4 X 1,422' X 7.48 gallons/ft3 = 232 gallons). For most small systems, it is unlikely that there is that much pipe between the well and the first customer. As a result, provisions for contact time will often have to be added to ensure 4-log virus inactivation.

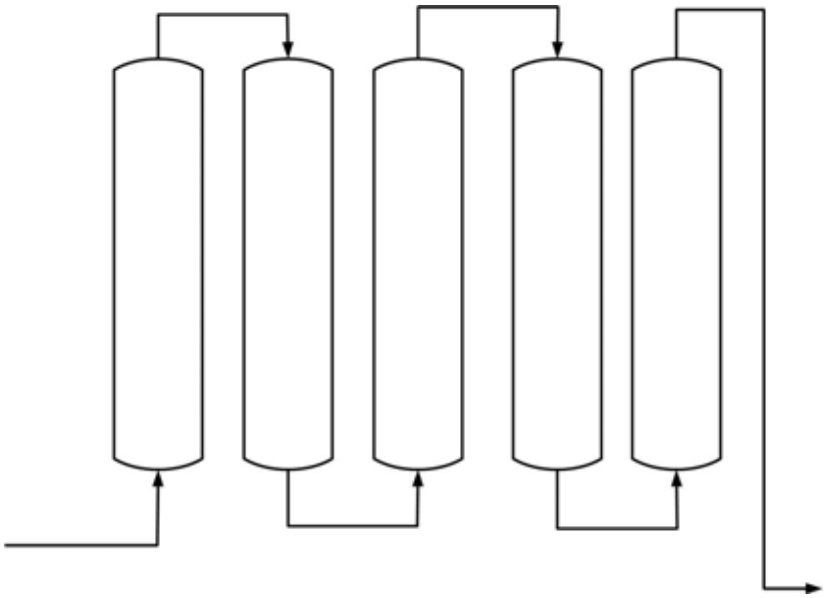
There are a variety of ways contact time can be added in small GWSs. Where possible, it is best and least expensive to try and add the contact time without the need for re-pumping the treated water. In this example, one could put 40 feet of 12-inch water main between the chlorine injection point and the first customer (i.e., Π (1')2/4 X 40' X 7.48 gallons/ft3 = 235 gallons) and, assuming plug flow, there would be a minimum of 4 minutes contact time at 58 gpm, thus, a CT of 4 mg/L-min. with a free chlorine residual of 1.0 mg/L.

Figure 4-3. Schematic of Hydropneumatic System



In some cases where there is adequate above-ground, heated storage, pressure vessels with a high length to diameter ratio can be useful tools for adding contact time without the need for pumping to storage and re-pumping. Figure 4-4 shows an example of five pressure vessels placed in series to provide contact time. Assuming each vessel has a diameter of 1.5 feet and a length of 8 feet, they would have a gross volume of 528 gallons. If the state granted a baffling factor of 0.7, this would provide an effective volume of 370 gallons, more than enough to ensure 4 minutes contact time.

Figure 4-4. Five Pressure Vessels in Series



Unlike chemical disinfectants, UV leaves no residual that can be monitored to determine UV dose and inactivation credit. The UV dose depends on UV intensity (measured by UV sensors), flow rate, and UV transmittance (UVT). UV intensity measurements may account for UVT depending on sensor locations. For systems using UV, a relationship between the required UV dose and these parameters should be established and then monitored at the water treatment plant to ensure sufficient disinfection. Section 4.4.7.4 discusses monitoring of UV treatment in more detail.

EPA has developed a UV dose table for inactivation of viruses (Table 4-8). Data published subsequent to the GWR proposal has indicated that some viruses, particularly adenoviruses, are more resistant than other viruses to UV light. Therefore, the final GWR does not include an explicit reference to UV as a stand-alone technology to achieve 4-log virus inactivation. EPA is concerned that fecally-contaminated ground water may contain adenoviruses, or other viruses, that are resistant to UV inactivation. EPA is aware that there is ongoing research addressing the effectiveness of UV in inactivating adenoviruses. However, at the time this document was developed there was not enough information on the new research to recommend UV as a stand-alone technology to achieve 4-log virus inactivation. As the findings of this new research are published and presented, states may decide to utilize this information when reviewing proposals from GWSs to install UV technologies.

Table 4-8. Virus Inactivation from UV dose (mJ/cm^2) [1]

Target Pathogen	Log Inactivation							
	0.5	**1.0**	**1.5**	**2.0**	**2.5**	**3.0**	**3.5**	**4.0**
Viruses	39	58	79	100	121	143	163	186

1. 40 CFR 141.720(d)(1).

Any UV reactors used for virus inactivation should undergo challenge testing to validate the dose level delivered so that effective public health protection is provided by systems using UV disinfection. At present, EPA is unaware of available challenge testing procedures that can be used to validate the

performance of UV reactors at dose levels needed for a 4-log inactivation of adenovirus. EPA is aware that there is ongoing research that may affect challenge testing procedures. However, at the time this document was developed there was not enough information on the new research to recommend UV as a stand-alone technology to achieve 4-log virus inactivation. As the findings of this new research are published and presented states may decide to utilize this information when reviewing proposals from GWSs to install UV technologies.

The UV technology can, however, be used in a series configuration or in combination with other inactivation or removal technologies to provide a total 4-log treatment of viruses to meet the GWR's requirements. EPA believes that a UV reactor dose verification procedure for 4-log inactivation of a range of viruses may be developed in the future. With the future development of UV validation procedures, it may become feasible for systems to demonstrate that they can achieve 4-log inactivation of viruses with a single UV light reactor. Therefore, the GWR allows states to approve and set compliance monitoring and performance parameters for any alternative treatment, including UV light or UV light in combination with another treatment technology that will ensure that systems continuously meet the 4-log virus treatment requirements.

The UV doses provided in Table 4-8 account for uncertainty in the UV dose-response relationships of viral pathogens but do not address other significant sources of uncertainty in full-scale UV disinfection applications. These other sources of uncertainty are due to the hydraulic effects of the UV installation, the UV reactor equipment (e.g., UV sensors), and the monitoring approach. Due to these factors, GWSs installing UV should use UV reactors that have undergone validation testing. This validation testing should determine the operating conditions under which the reactor delivers the required UV dose for treatment credit. Operating conditions should include flow, UV intensity as measured by a UV sensor, and UV lamp status. For more information on UV validation testing, refer to EPA's *Ultraviolet Disinfection Guidance Manual Final* (EPA 815-R-06-007, November 2006).

To receive inactivation credit, the UV reactors should be operated within the validated limits. When a UV reactor is operating outside of these limits, the UV reactor is operating off-specification. Ground water systems that use UV disinfection to provide inactivation of viruses for GWR compliance should demonstrate that at least 95 percent of the water delivered to the public during each month is treated by UV reactors operating within validated limits. Guidance on determining validated operating conditions is provided in EPA's *Ultraviolet Disinfection Guidance Manual Final* (EPA 815-R-06-007, November 2006).

4.4.7.2 Determine the minimum residual disinfectant concentration

> *(ii): The process the state will use to determine the minimum residual disinfectant concentration the system must provide prior to the first customer for systems using chemical disinfection.*

Guidance

Residual disinfectant concentration is the concentration of the disinfectant (in mg/L) at a point before or at the first customer. Systems conducting compliance monitoring and providing chemical disinfection must maintain a minimum residual disinfectant concentration at or before the first customer. This minimum residual disinfectant concentration is directly related to ensuring the system is achieving at least 4-log treatment of viruses before or by the time the water reaches the first user. The state primacy application must include an explanation and rationale for how the state will decide what that minimum residual disinfectant concentration will be for each system. If the state sets the minimum residual

disinfectant concentration level on a system-by-system basis, the application will need to explain the rationale and information that will be required from systems in order to make the determination.

States may consider setting minimum residual disinfectant concentrations on a system-by-system basis in accordance with CT requirements. Systems with substantial contact time before their first customers can achieve the required CT at a lower disinfectant residual concentration than systems with limited contact time. Therefore, states may determine it is appropriate to have different minimum residual disinfectant concentrations depending on the contact time available before the first customer. Alternatively, states may decide to require a uniform minimum residual disinfectant concentration that will apply to all systems using chemical disinfectant. In this case, states would have to take measures in their permitting process to ensure that adequate contact is available in each system to achieve 4-log virus inactivation. For either requirement, the state must explain in its primacy application the basis for its approach.

One approach for meeting this primacy requirement would be to point out that the state through its permitting (plant and specification approval) process, would address each system's specific configuration, water quality (e.g., temperature, pH), and require conditions of chlorine residual and contact time at peak momentary demand that would result in a minimum CT capable of inactivating 4-log viruses in accordance with EPA's CT tables.

4.4.7.3 State-approved alternative technologies

(iii): The state-approved alternative technologies that GWSs may use alone or in combination with other approved technologies to achieve at least 4-log treatment of viruses (using inactivation, removal, or a state-approved combination of inactivation and removal) before or at the first customer for a ground water source.

Guidance

Under this Special Primacy Requirement states must identify the state-approved alternative technologies that the GWS may use alone or in combination with other approved technologies to achieve at least 4-log virus inactivation, removal, or a state-approved combination of these technologies before or at the first customer. The application should include a list of the approved alternative technologies and the rationale for allowing the use of the alternative technologies.

States may want to allow themselves flexibility to address technologies that may emerge in the future by obtaining the authority to review and approve all treatment/disinfection technologies that have potential to be applied for removal and inactivation of microbial contaminants. If they do this, they should ensure in their permitting/approval process that there is adequate evidence confirming the long-term ability of the process(s) to achieve at least 4-log virus treatment.

Systems may claim credit for UV processes for inactivation of viruses. Section 4.4.7.1 explains EPA's concerns about current limitations of challenge testing of UV reactors with respect to adenoviruses (and perhaps other viruses) and EPA's recommendations to states regarding the application of UV treatment.

4.4.7.4 Monitoring and compliance criteria

(iv): The monitoring and compliance requirements the state will require for GWSs treating to at least 4-log treatment of viruses (using inactivation, removal, or a state-approved combination of inactivation and removal) before or at the first customer for state-approved alternative treatment technologies.

Guidance

State primacy applications should include an explanation of the monitoring requirements and compliance criteria the state will require for systems using alternative treatment technologies. This includes an explanation of the types of monitoring and reporting that systems will have to complete and submit to the state. States may want to consider each technology or combination of technologies, on a case-by-case basis and require appropriate monitoring for ensuring that a minimum of 4-log virus removal/inactivation would be achieved during peak momentary demand.

For example, EPA recommends that PWSs check their UV units daily to ensure they are operating properly. PWSs should monitor their UV reactors to determine if the reactors are operating within validated conditions. This monitoring should include UV intensity as measured by a UV sensor, flow rate, lamp status, and other parameters designated by the state. UV reactors should also be regularly monitored to diagnose operating problems, determine when maintenance is necessary, and maintain safe operation. In addition to monitoring operational parameters, PWSs should verify the calibration of UV sensors in accordance with a protocol that the state approves. States are encouraged to refer to EPA's *Ultraviolet Disinfection Guidance Manual Final* (EPA 815-R-06-007, November 2006) for more information on routine monitoring and calibration of UV units.

States are encouraged to require GWSs using UV to prepare and submit monthly reports to the state. The monthly report should include the percentage of off-specification water for the UV facility and the UV sensor calibration monitoring. The percentage of UV sensors checked for calibration should also be reported monthly. All UV sensors in operation that month should be checked. Additionally, the daily low validated dose or daily low UV intensity, depending on the dose-monitoring strategy, should be reported to the state monthly.

Example 4-4 provides an example of a summary report that could be completed by the PWS and submitted to the state on a monthly basis. Examples 4-5 and 4-6 are example operating logs that would be completed on a daily basis for the calculated dose and UV Intensity Setpoint Approach, respectively. The forms would be used to record the operating status of the UV equipment and to record the volume of water discharged during off-specification operation each day. Additional examples of operating logs for UV are provided in EPA's *Ultraviolet Disinfection Guidance Manual* (EPA 815-R-06-007, November 2006).

Example 4-4. Example Summary Monthly Report for a GWS Disinfecting with UV Radiation

Reporting Period: _____
System/Treatment Plant: _____
PWSID: _____
Signature of Principal Executive: _____ Date: _____
Officer or Authorized Agent: _____ Date: _____

			Off-Specification Data	
Unit Number	Total Run Time (hrs)	Total Production (MG)	Number of Off-Specification Events	Total Off-Specification Volume (MG)
Total				

Compliance Certification

Total Volume of Off-Specification Water Produced (MG) [A] _____
Total Volume of Water Produced (MG) [B] _____
Total Off-Specification Water Produced (% of Volume of Water Produced) ([A]/[B]*100) _____

Facility Meets Off-Specification Requirement (< 5% of Volume on a Monthly Basis) (Y/N) _____

Of the _____ sensors, _____ have been checked for calibration and _____ were within the acceptable range of tolerance.

The Following Reactors had a Sensor Correction Factor

Reactor Number	Sensor Correction Factor

Example 4-5. Example Daily Operating Log for Calculated Dose Approach

Reporting Period: _____
System/Treatment Plant: _____
PWSID: _____
UV Reactor: _____
Process Train: _____
Operator Signature: _____
Date: _____

Maximum Validated Flow Rate: _____
Minimum Validated UVT: _____
Target Log Inactivation: _____
Target Pathogen: _____
Dose Required ($D_{req'd}$): _____
Validation Factor (VF): _____

$$\text{Validated Dose} = \frac{\text{Calculated Dose}}{\text{VF} \times \text{CF}}$$

Calculated Dose =Dose that is calculated by validated PLC algorithm
VF = Validation factor
CF = UV intensity sensor correction factor.
The CF is only applied if sensors do not meet recommended criteria
(NOTE – a CF will not be needed in most cases)

Operational Data			Dose Requirements	Data at Daily Minimum Validated Dose					UV Dose Adequacy Determination	Total Off-Specification
Day	Run Time (hrs)	Total Production (MG)	$D_{req'd}$[1] (mJ/cm^2) [A]	Sensor Correction Factor[2] [B]	Calculated Dose[3] (mJ/cm^2) [C]	Daily Minimum Validated Dose[4] ([C]/[VF]/[B]) (mJ/cm^2) [D]	Flow Rate (MGD)	UVT (%)	Validated Dose > $D_{req'd}$ ([D] > [A]) (Y/N)	Total Off-Specification Volume (MG)
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										
31										
Min										
Max										
Total										

[1] $D_{req'd}$ is the dose required for the target log inactivation without a VF or Sensor CF applied and can be found in the UVDGM Table 1.4.
[2] Sensor CF will be 1 is no CF is used
[3] Calculated dose is calculated using the dose algorithm in the PLC.
[4] The Validated Dose is the dose based on the calculated dose that is normalized on the Validation Factor and Correction Factor
[5] Off-specification worksheet (Figure 6.5) should be used to calculate daily off-specification volume. If UVT, flowrate, and/or Validated Dose off-specification occur simultaneously, the off-specification time should only be counted once

Example 4-6. Example Daily Operating Log for UV Intensity Setpoint Approach

Reporting Period: _____
System/Treatment Plant: _____
PWSID: _____
UV Reactor: _____
Process Train: _____
Operator Signature: _____
Date: _____

Maximum Validated Flow Rate: _____
Minimum Validated UVT: _____
Target Log Inactivation: _____
Target Pathogen: _____
Intensity Setpoint: _____

Operational Data						Intensity Requirements			Daily Minimum Intensity		Total Flow Off-Specification
			Flow Rate								
Day	Run Time (hrs)	Total Production (MG)	Min (mgd)	Ave (mgd)	Max (mgd)	Intensity Setpoint (W/m^2) [A]	Sensor Correction Factor[1] [B]	Adjusted Intensity Setpoint (W/m^2) ([A] * [B]) [C]	Daily Minimum Intensity (W/m^2) [D]	Minimum Daily Intensity > Adjusted Intensity Setpoint ([D] > [C]) (Y/N)	Total Flow Off-Specification[3] (MG)
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
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28											
29											
30											
31											
Min											
Max											
Total											

[1] Sensor CF will be 1 is no CF is used.
[2] UVT measurements are not required but could be useful in addressing operational issues.
[3] Off-specification worksheet (Figure 6.5) should be used to calculate daily off-specification volume. If UV intensity or flowrate off-specification occur simultaneously, the off-specification time should only be counted once

4.4.7.5 Monitoring, compliance, and membrane integrity testing requirements

(v): The monitoring, compliance and membrane integrity testing requirements the state will require to demonstrate virus removal for GWSs using membrane filtration technologies.

A GWS that uses membrane filtration to meet the treatment technique requirements must monitor the membrane filtration process in accordance with state-specified monitoring requirements. A GWS that uses membrane filtration is in compliance with the treatment requirement to achieve at least 4-log removal of viruses when:

- The membrane has an absolute molecular weight cut-off or an alternate parameter that describes the exclusion characteristics of the membrane and can reliably achieve at least 4-log removal of viruses;
- The membrane process is operated in accordance with state-specified compliance requirements; and,
- The integrity of the membrane is intact.

Because removal of viruses by membrane filtration does not enable measurement of a residual or measurable turbidity breakthrough to ensure treatment performance, states must provide alternative compliance monitoring criteria. Criteria must ensure maintenance of the integrity of the membrane to prevent passage of virus particles. Criteria may include routine pressure testing and reporting of the results as prescribed by the membrane manufacturer, turbidity monitoring, monitoring of an associated chemical parameter, or other site-specific variables.

To grant removal credit to systems using membrane filtration, states should ensure that the membrane technology is a pressure- or vacuum-driven separation process in which particulate matter is rejected by a nonfibrous, engineered barrier, primarily through a size exclusion mechanism. The membrane technology should also allow for routine direct integrity testing while in operation to verify that the removal efficiency demonstrated through challenge testing is being achieved.

The removal efficiency demonstrated during challenge testing establishes the maximum removal credit that a membrane filtration process is eligible to receive, provided this value is less than or equal to the maximum log removal value that can be verified by the direct integrity test (a physical test applied to a membrane unit to identify and isolate integrity breaches such as leaks). The state may use its discretion when considering data from challenge studies conducted prior to promulgation of the GWR in lieu of requiring additional testing. Additional requirements and guidance on membrane filtration is provided in EPA's *Membrane Filtration Guidance Manual: Overview and Summary Factsheet* and EPA's *Membrane Filtration Guidance Manual* (EPA 815-R-06-009, November 2005).

4.4.7.6 Discontinuation of 4-log virus inactivation, removal, or a state-approved combination of these technologies

(vi): The criteria, including public health-based considerations and incorporating on-site investigations and source water monitoring results, the state will use to determine if a GWS may discontinue 4-log treatment of viruses (using inactivation, removal, or a state-approved combination of inactivation and removal) before or at the first customer.

Guidance

A GWS may discontinue 4-log treatment of viruses if the state determines and documents in writing that 4-log treatment of viruses is no longer necessary for that ground water source. The state primacy application must include an explanation of what criteria the state will use to determine whether a water system may discontinue its 4-log treatment of viruses. These criteria should be strict enough to not compromise public health protection if the 4-log treatment were to be discontinued. EPA encourages states to set rigorous requirements for discontinuing treatment. Criteria may include results of on-site investigations, source water monitoring, and documentation of well rehabilitation. For example, system and state could document that a source of contamination has been completely removed and will no longer present a threat to the ground water source being treated. If the state were to determine and document that source water protection actions eliminated the source of fecal contamination, the state may decide to allow the GWS to discontinue its treatment.

Examples of when it may be appropriate to discontinue treatment are:

- The previous source is replaced by a source that has been shown to be less sensitive hydrogeologically and free from contamination based on source water monitoring;

- A well with structural conditions resulting in impairment of its water quality (e.g., not terminated above grade, inadequate well cap, lack of sanitary seal, improper grouting) is rehabilitated and conditions no longer exist; and,

- A year of monthly source water monitoring for a fecal indicator and detailed evidence that the well is drawing water from a protected confined or semi-confined aquifer.

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Section 5

SDWIS Reporting and SNC Definitions

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Section 6

Public Notification, Consumer Confidence Report, and Special Notice Examples

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Several general categories of notification are required by the Ground Water Rule (GWR):

- Public Notification (PN) Tier 1, 2, or 3 public notification
  - Community and Noncommunity GWSs
- Consumer Confidence Report (CCR) Water Quality Data Table
  - Community GWSs
- Special Notice
  - Community GWSs – Notice included in CCR
  - Noncommunity GWSs

The type of notification required depends on the violation or scenario that has occurred at the public water system (PWS). Table 6-1 summarizes public notification, CCR and special notice requirements of the GWR. Note that special notice requirements for community GWSs require notification to be included in the system's CCR. Noncommunity GWSs that are required to make special notice must inform the public served by the water system in a manner approved by the state. Section 3.8 of this guidance manual addresses the GWR's public notice requirements.

Table 6-1. Public Notification, CCR, and Special Notice Requirements

Issue	Notification Required
Uncorrected significant deficiency – *CWSs*[1]	Special Notice in CCR
Uncorrected significant deficiency – *NCWSs*[1]	Special Notice
Fecal indicator positive ground water source sample – *CWS*[2]	Tier 1 PN and Special Notice in CCR
Fecal indicator positive ground water source sample – *NCWS*[2]	Tier 1 PN
Fecal indicator-positive ground water source sample (until corrective action is completed) – *CWSs*[3]	Special Notice in CCR
TT – Failure to take corrective action – *CWSs*	Tier 2 PN, CCR
TT – Failure to take corrective action – N*CWSs*	Tier 2 PN
TT – Failure to maintain at least 4-log treatment of viruses for GWSs conducting compliance monitoring – *CWSs*	Tier 2 PN, CCR
TT – Failure to maintain at least 4-log treatment of viruses for GWSs conducting compliance monitoring – *NCWS*	Tier 2 PN
Failure to meet monitoring requirements – *CWSs*	Tier 3 PN, CCR
Failure to meet monitoring requirements – N*CWSs*	Tier 3 PN
All detects from source water monitoring or range of results for chemical disinfectants	CCR Water Quality Data Table

1. Systems must continue to notify the public annually until the significant deficiency has been corrected.
2. Consecutive systems served by the ground water source must also notify the public.
3. CWSs must continue to notify the public annually until the state determines the fecal contamination has been corrected.

This section provides examples of public notifications, CCR excerpts and special notices that satisfy notification requirements of the GWR. In the examples provided, language in italics is required by 40

CFR Appendix A to Subpart O of Part 141 or by 40 CFR Appendix B to Subpart Q of Part 141. The following scenarios are addressed:

- Scenario 1: Source Water Sample is Positive for a Fecal Coliform Indicator – *Community GWS*
- Scenario 2: System Fails to Comply With a State Corrective Action Plan or Schedule – *Noncommunity GWS*
- Scenario 3: System Fails to Take Corrective Action Following a Significant Deficiency – *Community GWS*
- Scenario 4: System Fails to Maintain at Least 4-log Treatment of Viruses – *Community GWS*
- Scenario 5: System Fails to Collect a Source Water Sample – *Community GWS*
- Scenario 6: System Fails to Conduct Compliance Monitoring – *Noncommunity GWS*

The organization of the templates provided here follows the organization of the templates for other notification requirements that are currently available in EPA's:

- *Revised Public Notification Handbook* – EPA 816-R-07-003, March 2007. Available at www.epa.gov/safewater/publicnotification/pdfs/guide_publicnotification_pnhandbook.pdf.
- *Public Notification Handbook for Transient Non-community Water Systems* – EPA 816-R-07-004, March 2007. Available at www.epa.gov/safewater/publicnotification/pdfs/guide_publicnotification_pnhandbook_tncws.pdf.

Readers are encouraged to refer to these manuals for additional public notification guidance. Systems with a large proportion of non-English speaking consumers should refer to these manuals for examples of notices that use language other than English to provide key information.

Scenario 1: A Source Water Sample is Positive for a Fecal Coliform Indicator

System Description – System A

System A is a community GWS serving 1,500 people. The system has two wells in use year-round and does not provide 4-log treatment of viruses before or at the first customer.

Situation

On April 2, 2010, the system collects its two routine monthly TCR samples for April. The system is notified by the laboratory on the afternoon of April 4 that one of its routine samples is total-coliform positive. On the morning of April 5, the system collects samples from both wells and delivers the samples to the laboratory for analysis. The analysis shows that one of the two source water samples is positive for *E. coli*.

Public Notification, Special Notice and CCR Requirements

Public Notification

System A has detected a fecal indicator (i.e., *E. coli*) in its source water sample. While the system has not had a violation, it must provide Tier 1 public notification as soon as practical but no later than 24 hours of learning that the source water sample was *E. coli*-positive (i.e., no later than April 7, 2010). Notification can be made via radio, TV, hand delivery, posting, or other method specified by the state, along with other methods if needed to reach persons served. The system must initiate consultation with the state within 24 hours of learning of the *E. coli*-positive sample result (or by April 7, 2010). An example of a public notice that fulfills the Tier 1 public notification requirement for this scenario is shown in Example 6-1.

Special Notice in the CCR

A CWS that receives notice of a fecal indicator-positive ground water source sample must provide special notice in the CCR addressing that year, informing the public served by the water system of the fecal indicator-positive source sample. The system must continue to inform the public annually (as special notice in the CCR) until the state determines that the fecal contamination in the ground water source has been corrected. In order to address this special notice requirement, the following elements must be included in the CCR:

- The nature of the source of the fecal contamination (if the source is known) and the dates of the fecal indicator positive ground water source sample(s).
- If the fecal contamination in the ground water source has been addressed.
- For fecal contamination in the ground water source that has not been addressed, the state-approved plan and schedule for correction, including interim measures, progress to date, and any interim measures completed.
- The potential health effects using the health effects language of 40 CFR Appendix A of Subpart O.

Example 6-2 provides an example that fulfills this special notice requirement for this scenario.

CCR

In addition to the special notice requirements, a CWS must also include the fecal indicator-positive result in the Regulated Contaminant table in the CCR addressing that year. Example 6-2 provides an example that fulfills this CCR requirement for this scenario.

Example 6-1. Example Tier 1 Public Notification for a Fecal Indicator-Positive Triggered Source Water Sample

IMPORTANT INFORMATION ABOUT YOUR DRINKING WATER
System A Well 1 Tested Positive for Fecal Contamination

Our water system detected fecal indicators (*E. coli)* in one of our two wells. As our customers, you have a right to know what happened and what we are doing to correct this situation. On April 4, we learned that one of our routine samples collected April 2 was total coliform positive. As required by EPA's Ground Water Rule, one of our follow-up steps was to collect samples from both of our wells. The sample from Well 1 collected on April 5 tested positive for a fecal indicator (*E. coli).* We are now conducting additional sampling of the well to determine the extent of the problem and are conducting a thorough investigation to determine the source of the contamination.

What should I do?
DO NOT DRINK THE WATER WITHOUT BOILING IT FIRST. Bring all water to a rolling boil, let it boil for one minute, and let it cool before using it. Boiling kills bacteria and other organisms in the water. You may also use bottled water. Use boiled or bottled water for drinking, making ice, preparing food, and washing dishes until further notice.

Also, if you have a severely compromised immune system, have an infant, or are elderly, you may be at increased risk and should seek advice about drinking water from your health care providers. General guidelines on ways to lessen the risk of infection by microbes are available from EPA's Safe Drinking Water Hotline at (800) 426-4791. If you have specific health concerns, consult your doctor. We are also providing regular updates on this situation on Channel 22 or Radio Station KMMM (97.3 FM).

What does this mean?
Inadequately treated or inadequately protected water may contain disease-causing organisms. These organisms can cause symptoms such as diarrhea, nausea, cramps, and associated headaches. *Fecal indicators are microbes whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term health effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely compromised immune systems.* These symptoms are not caused only by organisms in drinking water. If you experience any of these symptoms and they persist, you may want to seek medical advice.

What is being done?
We are conducting a thorough investigation to determine the source of the contamination and will be working with the State Department of Public Health to implement corrective actions to ensure that our water supplies are protected against contamination. We will keep you informed of the steps we are taking to protect your drinking water and will provide information on any steps you should be taking, until this problem is corrected.

For more information, please contact John Johnson, manager of System A, at (555) 555-1234 or write to 2600 Winding Rd., Townsville, TM 12345.

Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.

This notice is being sent to you by System A.

State Water System ID# TM 1234582. Sent: 4/7/2010

Example 6-2. Example of Regulated Contaminant Table and Special Notice in the CCR for Source Water Fecal Contamination

Source Water Quality Data

Contaminant	MCL/MRDL/TT	MCLG	Value	Date	Violation	Typical Sources
Fecal indicators (*E. coli*)	TT	N/A	Positive (*E. coli*)	April 5, 2010	No	Human and animal fecal waste

*System A detected *E. coli* in their source water sample; the sample was collected in response to a total coliform-positive routine sample collected on April 2, 2010. More information about this situation is provided in the Situation section.

Situation

- On April 4, 2010 we were informed that one of our routine total coliform samples collected on April 2 was total coliform-positive. As required by the Ground Water Rule, we collected samples from both of our sources, Wells 1 and 2, and had them analyzed for fecal contamination. The sample for Well 1 was positive for fecal contamination (*E. coli*).

- Inadequately treated or inadequately protected water may contain disease-causing organisms. These organisms can cause symptoms such as diarrhea, nausea, cramps, and associated headaches. *Fecal indicators are microbes whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term health effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely compromised immune systems.*

- In response, we sent notices to all of our customers within 24 hours of learning of this positive sample. We carefully considered our options and developed a plan with the State Department of Public Health to extend the well's casing higher above the ground, replace the well cap, and install treatment (chlorination). As we stated in the most recent update on this issue, treatment was installed on June 1, 2010.

Scenario 2: A System Fails to Comply With a State Corrective Action Plan or Schedule

System Description – System B

System B is a noncommunity GWS serving 800 people. The system has one well in use year-round and does not provide 4-log treatment of viruses before the first customer.

Situation

During a sanitary survey on September 1, 2013, the state identifies a significant deficiency—two leaking septic tanks close to the system's well. The system is notified of the deficiency in a letter from the state on September 14, 2013. The letter does not indicate a specific corrective action that the system is required to take. As required, the system contacts the state within 30 days of receiving written notice of the significant deficiency and the system and the state develop a plan for implementing corrective action. The corrective action plan is scheduled to be completed by January 31, 2014.The system, however, does not begin implementing the plan until February 25, 2014 and completes the plan's steps on October 20, 2014. In waiting so long to begin implementing its corrective action plan, the system failed to be in compliance with its state-approved corrective action plan and schedule. The system is notified of this treatment technique violation on March 1, 2014.

Public Notification, Special Notice and CCR Requirements

Public Notification

Although System B contacts the state regarding the significant deficiency within the 30-day timeframe, the system is required to be in compliance with its corrective action plan and schedule within 120 days of receiving written notice from the state of the significant deficiency. Failure to do this is a treatment technique violation and requires Tier 2 public notification. The system must provide public notification within 30 days of learning of the violation. Notification must be provided by mail or other direct delivery method (such as hand delivery), and any other reasonable method may be used to reach affected individuals who would not have received the information by mail or the direct delivery method. For any unresolved violation following an initial Tier 2 notice, notice must be repeated every 3 months for as long as the violation persists. The system is notified of the violation on March 1, 2014 and therefore must provide Tier 2 public notice by March 31, 2014. Since corrective action is not back on schedule within 3 months of that date, the system has to repeat the public notice. An example of a public notice that fulfills the Tier 2 public notification requirements for this violation is shown in Example 6-3.

Special Notice

Noncommunity GWSs that receive notice from the state of a significant deficiency must also provide special notice to customers of any deficiencies that have not been corrected within 12 months of being notified by the state of the deficiency (or earlier, if directed by the state). System B does not complete corrective action until October 20, 2014, which is more than 12 months after the system had been notified of the significant deficiency (September 14, 2013). System B must therefore make special notice in September 2014 to inform the public served by the system about the significant deficiency. Example 6-4 provides sample special notice language for this scenario. Since System B is a NCWS and does not distribute a CCR, special notice will be provided in a manner approved by the state.

CCR

Since System B is a NCWS, it does not have any CCR requirements.

Example 6-3. Example Tier 2 Public Notification for Failure to Comply With State Corrective Action Plan or Schedule

DRINKING WATER NOTICE
System B Failed to Comply With the Established Corrective Action Plan and Schedule after Identification of a Significant Deficiency

On September 1, 2013 the State Department of Public Health performed a detailed inspection and engineering evaluation of our water system called a sanitary survey. During this sanitary survey, they identified two leaking septic tanks close to our well. Because of the high potential for contamination of our well by these tanks, the state considered this a "significant deficiency" and directed us to correct the problem. As our customers, you have a right to know what happened and what we are doing to correct this situation. As required by EPA's Ground Water Rule, we worked with the State to develop a plan to correct this deficiency. However, we failed to implement this corrective action plan within the established deadline and have violated a requirement of the Ground Water Rule.

What does this mean?
This is not an emergency. If it had been an emergency, you would have been notified within 24 hours.

This significant deficiency has the potential to cause source water contamination. Leaking septic tanks are a potential source of fecal contamination. *Inadequately treated or inadequately protected water may contain disease-causing organisms. These organisms can cause symptoms such as diarrhea, nausea, cramps, and associated headaches.* Failure to correct the deficiency according to the established schedule prolonged the risk of fecal contamination of our source water. While we have not detected any evidence of fecal contamination in our source water, we are committed to correcting the deficiency to eliminate the threat of contamination.

What should I do?
There is nothing you need to do unless you have a severely compromised immune system, have an infant, or are elderly. These people may be at increased risk and should seek advice about drinking water from their health care providers. General guidelines on ways to lessen the risk of infection by microbes are available from EPA's Safe Drinking Water Hotline at (800) 426-4791. If you have specific health concerns, consult your doctor.

You do not need to boil your water or take other corrective actions. If a situation arises where the water is no longer safe to drink, you will be notified within 24 hours. We will announce any emergencies on Channel 22 or Radio Station KMMM (97.3 FM).

What is being done?
Since being informed of the deficiency, we have been conducting regular testing of our source water and we are implementing the corrective action plan established by the State Department of Public Health. Under this plan, the leaking tanks will be replaced by October 20, 2014.

For more information, please contact John Johnson, manager of System B, at (555) 555-1234 or write to 2600 Winding Rd., Townsville, TM 12345.

Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.

This notice is being posted by System B.

State Water System ID# TM1234583. Sent: 9/10/2014

Example 6-4. Example of a Special Notice Regarding a Significant Deficiency

Violation

On September 14, 2013, we were informed by the State Department of Public Health that a significant deficiency—two leaking septic tanks near our source water supply—had been identified during a September 1, 2013 sanitary survey.

As required, we contacted the State Department of Public Health and were directed to make arrangements with the owner of the property on which the septic tanks are located to have the tanks replaced. We did not do so within the established deadline. Since being informed of the deficiency, we have been conducting regular testing of our source water and we are implementing the corrective action plan established by the Department of Public Health. Under this plan, the leaking tanks will be replaced by October 20, 2014.

Scenario 3: A System Fails to Take Corrective Action Following a Significant Deficiency

System Description – System C

System C is a community GWS serving 1,500 people. The system has one well in use year-round and does not provide 4-log treatment of viruses before or at the first customer.

Situation

During a sanitary survey on June 1, 2013, the state identifies a significant deficiency—the system operator's certification has lapsed. The system is notified of the deficiency in a letter from the state on June 10, 2013. The state directs System C to take immediate corrective action by bringing on a new, certified operator or having the current operator take all necessary steps to renew certification as soon as possible. The system is told it must complete corrective action within 120 days of receiving written notification from the state of the significant deficiency, or by October 8, 2013. By October 8th, the system's operator has still not been recertified and the system has not hired a new certified operator. The system is notified of its violation on November 15, 2013, for failure to take corrective action within 120 days of receiving written notice. System C finally hires a certified operator on December 20, 2013.

Public Notification, Special Notice and CCR Requirements

Public Notification

Failure to correct a significant deficiency is a treatment technique violation and requires Tier 2 public notification. The system must provide public notification within 30 days of learning of the violation, or by December 14, 2013. Notification must be provided by mail or other direct delivery method (such as hand delivery), and any other reasonable method may be used to reach affected individuals that would not have received the information by mail or the direct delivery method. For any unresolved violation following an initial Tier 2 notice, notice must be repeated every 3 months for as long as the violation persists. A system therefore has to repeat the notice until corrective action has been taken. In this scenario, System C hired a certified operator the month after receiving the violation, so System C is not required to make repeat public notification.

An example of a public notice that fulfills the public notification and special notification requirements for this violation is shown in Example 6-5.

Special Notice

Since the significant deficiency was addressed (System C hires a certified operator in December 2013), there is no special notice requirement.

CCR

All treatment technique violations must also be included in the CCR. An explanation of how the system returned to compliance could also be included.

An example of a report of this violation that could be used in the system's CCR is shown in Example 6-6.

Example 6-5. Example Tier 2 Public Notification for Failure to Take Corrective Action

IMPORTANT INFORMATION ABOUT YOUR DRINKING WATER
System C Failed to Take Corrective Action Following Identification of a Significant Deficiency

On June 1, 2013 the State Department of Public Health performed a detailed inspection and engineering evaluation of our water system called a sanitary survey. During this sanitary survey, they identified a significant deficiency in our system (our water system operator's certification had lapsed). As our customers, you have a right to know what happened and what we are doing to correct this situation. As required by EPA's Ground Water Rule, we worked with the State to develop a plan to correct this deficiency. However, we failed to implement this plan before the established deadline and have therefore violated a requirement of the Ground Water Rule.

What should I do?
There is nothing you need to do unless you have a severely compromised immune system, have an infant, or are elderly. These people may be at increased risk and should seek advice about drinking water from their health care providers. General guidelines on ways to lessen the risk of infection by microbes are available from EPA's Safe Drinking Water Hotline at (800) 426-4791. If you have specific health concerns, consult your doctor.

You do not need to boil your water or take other corrective actions. If a situation arises where the water is no longer safe to drink, you will be notified within 24 hours. We will announce any emergencies on Channel 22 or Radio Station KMMM (97.3 FM).

What does this mean?
This is not an emergency. If it had been an emergency, you would have been notified within 24 hours.

This significant deficiency has the potential to result in lack of proper treatment and oversight of the water system. *Inadequately treated or inadequately protected water may contain disease-causing organisms. These organisms can cause symptoms such as diarrhea, nausea, cramps, and associated headaches.* While we have not detected any evidence of contamination or other health threats related to our source water, we are still committed to correcting the deficiency to eliminate the threat of contamination.

What is being done?
The Townsville Utilities Board is in the process of identifying a new certified operator for our water system. We will provide notice to you as soon as we hire a new, certified operator.

For more information, please contact John Johnson, manager of System C, at (555) 555-1234 or write to 2600 Winding Rd., Townsville, TM 12345.

Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.

This notice is being sent to you by System C.

State Water System ID# TM 1234583. Sent: 12/13/2013

Example 6-6. Example of a Notice in the CCR for Failure to Take Corrective Action

Violation

On June 10, 2013, we were informed by the State Department of Public Health that a significant deficiency—lack of a properly certified operator—had been identified during a June 1, 2013 sanitary survey.

We were directed by the Department of Public Health to take immediate action to correct this deficiency by ensuring that our current operator took all necessary steps to be recertified or by hiring a new, properly certified operator. Although we hired a properly certified operator in December 2013, we did not do so within the required deadline.

Scenario 4: A System Fails to Maintain at Least 4-log Treatment of Viruses

System Description – System D

System D is a community GWS serving 8,500 people. The system has two wells in use year-round. In 2010, System D installed chlorine treatment at both wells as a corrective action to address a significant deficiency identified by the state. System D also began compliance monitoring at that time.

Situation

During a sanitary survey on January 10, 2011, the state determines that due to a malfunctioning chlorine pump, the system has not been providing 4-log treatment of viruses at one of its wells for at least 2 weeks. The problem is identified during the sanitary survey and the system is officially notified of its failure to consistently provide 4-log treatment in a letter from the state on February 1, 2011. The state also directs System D to take corrective action to restore 4-log treatment as soon as possible.

Public Notification, Special Notice and CCR Requirements

Public Notification

A ground water system subject to the compliance monitoring requirements under 40 CFR 141.403(b)(3) that fails to maintain at least 4-log treatment of viruses (using inactivation, removal, or a state-approved combination of 4-log virus activation and removal) before or at the first customer for a ground water source has committed a treatment technique violation and must provide Tier 2 public notification. The system must provide public notification within 30 days of learning of the violation. Notification must be provided by mail or other direct delivery method (such as hand delivery), and any other reasonable method may be used to reach affected individuals that would not have received the information by mail or the direct delivery method. For any unresolved violation following an initial Tier 2 notice, notice must be repeated every 3 months for as long as the violation persists.

An example of a public notice that fulfills the public notification requirements for this violation is shown in Example 6-7.

Special Notice

No special notice is required for this scenario.

CCR

All treatment technique violations must also be included in the CCR. An explanation of how the system returned to compliance could also be included.

An example of a report of this violation that could be used in the system's CCR is shown in Example 6-8.

Example 6-7. Example Tier 2 Public Notification for Failure to Maintain at Least 4-Log Treatment of Viruses

IMPORTANT INFORMATION ABOUT YOUR DRINKING WATER
System D Failed to Maintain Required Treatment of Viruses at Well 1

From December 27, 2010 to January 12, 2011, our water system did not provide chlorine in the water being used from Well 1 due to a malfunctioning chlorine feed pump. As a result, our water was not as disinfected as the state requires it to be. Our water system violated a treatment technique standard for maintaining adequate disinfection for water delivered to customers from Well 1. As our customers, you have a right to know what happened and what we are doing to correct this situation. After this problem was identified during a state inspection of our treatment facilities, we took immediate steps to repair the malfunctioning chlorine pump. The treatment system has been repaired and is now operating properly.

What should I do?
There is nothing you need to do unless you have a severely compromised immune system, have an infant, or are elderly. These people may have been at increased risk when our system failed to provide adequate disinfection and should seek advice about drinking water from their health care providers. General guidelines on ways to lessen the risk of infection by microbes are available from EPA's Safe Drinking Water Hotline at (800) 426-4791. If you have specific health concerns, consult your doctor.

You do not need to boil your water or take other corrective actions. If a situation arises where the water is no longer safe to drink, you will be notified within 24 hours. We will announce any emergencies on Channel 22 or Radio Station KMMM (97.3 FM).

What does this mean?
This is not an emergency. If it had been an emergency, you would have been notified within 24 hours.

Inadequately treated or inadequately protected water may contain disease-causing organisms. These organisms can cause symptoms such as diarrhea, nausea, cramps, and associated headaches. While we have not detected any evidence of contamination in, or other health threats to, our source water, we are still committed to restoring the required level of treatment to the water from Well 1 to eliminate the threat of contamination.

What is being done?
We have replaced the malfunctioning chlorine pump and regular sampling has shown that we are once again providing adequate disinfection of water from Well 1.

For more information, please contact John Johnson, manager of System D, at (555) 555-1234 or write to 2600 Winding Rd., Townsville, TM 12345.

Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.

This notice is being sent to you by System D.

State Water System ID# TM 1234584. Sent: 2/10/2011

Example 6-8. Example of a Notice in the CCR for Failure to Maintain at Least 4-Log Treatment of Viruses

Violation

On January 10, 2011 state inspection of our water system identified a malfunctioning chlorine pump. As a result, the water from one of our wells (Well 1) was not adequately disinfected for 2 weeks.

As directed by the Department of Public Health, we took immediate action to resolve this problem by repairing the malfunctioning chlorine pump. Regular testing since the pump was repaired has demonstrated that we are once again providing water that meets the State's standards for disinfection to our customers.

Scenario 5: A System Fails to Collect a Source Water Sample

System Description – System E

System E is a community GWS serving 10,000 people. The system has four wells in use year-round and does not provide 4-log treatment of viruses before or at the first customer.

Situation

On December 15, 2011, the system is notified by the laboratory that one of its routine monthly total coliform samples is total-coliform positive. The system collects three repeat samples as required under the TCR, but does not collect any source water samples. The state notifies the system that it is in violation of the GWR requirements on January 2, 2012. System E collects samples from all four wells to have them tested for fecal indicators on January 4, 2012. None of the samples is positive for fecal indicators.

Public Notification, Special Notice and CCR Requirements

Public Notification

System E has committed a monitoring violation. It is required to collect samples from each water source in use at the time the total coliform-positive sample was collected, within 24 hours of learning of the total coliform-positive routine TCR sample. The system must provide Tier 3 public notification within 1 year of learning of the violation. Notification must be provided by mail or other direct delivery method (such as hand delivery), and any other reasonable method to reach affected individuals that would not have received the information by mail or the direct delivery method used. Notice must be provided to each customer receiving a bill and other service connections to which water is delivered.

Special Notice

No special notice is required for this scenario.

CCR

Since System E is a CWS, it could use the CCR to inform the public of the Tier 3 violations if the CCR is released within 1 year of the system's learning of the violations. For this particular example, the system became aware of the monitoring violation on January 2, 2012. The public could therefore be informed of the violation in the CCR produced for calendar year 2011.

An example of a public notice that fulfills the public notification requirements for this violation is shown in Example 6-9. An example of a report of this violation in the CCR is shown in Example 6-10.

Example 6-9. Example Tier 3 Public Notification for Failure to Collect Source Water Sample(s) Following a Routine Total Coliform-Positive Distribution System Sample Result

IMPORTANT INFORMATION ABOUT YOUR DRINKING WATER
Monitoring Requirements not Met for System E

Our water system recently failed to collect source water samples for fecal indicators following a total coliform-positive routine distribution system sample. Although this incident was not an emergency, as our customers, you have a right to know what happened and what we did to correct the situation.

What should I do?
There is nothing you need to do. You do not need to boil your water or take other corrective actions. You may continue to drink the water. If a situation arises where the water is no longer safe to drink, you will be notified within 24 hours. We will also announce any emergencies on Channel 22 and Radio Station KMMM (97.3 FM).

What was done?
We collected samples from all four wells and had them tested for fecal indicators on January 4, 2012. None of the samples was positive for fecal indicators.

For more information, please contact John Johnson, manager of System E, at (555) 555-1234 or write to 2600 Winding Rd., Townsville, TM 12345.

Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.

This notice is being sent to you by System E.

State Water System ID# TM 1234585. Sent: 2/5/2012

Example 6-10. Example of a Notice in the CCR for Failure to Collect Source Water Sample(s) Following a Routine Total Coliform-Positive Distribution System Sample Result

Violation

On December 15, 2011, we were informed by our laboratory that one of our routine bacteriological samples for December tested positive for total coliform.

We were required to collect follow-up samples within 24 hours of learning of the total coliform-positive sample. Follow-up samples needed to be tested for fecal indicators from all sources that were active at the time the total coliform-positive sample was collected. Since we were notified of the total coliform-positive sample on December 15, 2011, we were required to collect the follow-up samples December 16, 2011. Source water samples were instead collected on January 4, 2012, and all of the samples were negative for fecal indicators.

Failure to conduct source water monitoring within the required 24 hour period is a monitoring and reporting violation.

Scenario 6: A System Fails to Conduct Compliance Monitoring

System Description – System F

System F is a noncommunity GWS serving 3,900 people. The system has two wells in use year-round and notifies the state in November 2009 that it provides 4-log treatment of viruses before the first customer and conducts compliance monitoring.

Situation

The system is conducting continuous residual disinfectant monitoring in accordance with the GWR and recording the lowest residual disinfectant concentration every day it serves water to the public. For 1 week that the system is in operation in April 2010, the system fails to conduct residual disinfectant monitoring. The state notifies the system that it is in violation of the GWR monitoring requirements on May 25, 2010.

Public Notification, Special Notice and CCR Requirements

Public Notification

System F has committed a monitoring violation. Because it serves more than 3,300 people and provides 4-log treatment of viruses, the system must continuously monitor the residual disinfectant level at a state-approved location. The system must provide Tier 3 public notification within 1 year of learning of the violation. Notification must be provided by mail or other direct delivery method (such as hand delivery), and any other reasonable method to reach affected individuals that would not have received the information by mail or the direct delivery method used. Notice must be provided to each customer receiving a bill and other service connections to which water is delivered.

An example of a public notice that fulfills the public notification requirements for this violation is shown in Example 6-11.

Special Notice

No special notice is required for this scenario.

CCR

Because System F is a NCWS, it is not required to prepare and distribute a CCR.

Example 6-11. Example Tier 3 Public Notification for Failure to Conduct Compliance Monitoring

DRINKING WATER NOTICE
Monitoring and Reporting Requirements Not Met for System F

Our water system recently failed to collect routine samples for residual disinfectants in the water that we deliver to you. Although this incident was not an emergency, as our customers, you have a right to know what happened and what we did to correct the situation.

What should I do?
There is nothing you need to do. You do not need to boil your water or take other corrective actions. You may continue to drink the water. If a situation arises where the water is no longer safe to drink, you will be notified within 24 hours. We will announce any emergencies on Channel 22 or Radio Station KMMM (97.3 FM).

What was done?
Our continuous disinfection residual monitoring equipment has been repaired and all monitoring requirements are being satisfied.

For more information, please contact John Johnson, manager of System F, at (555) 555-1234 or write to 2600 Winding Rd., Townsville, TM 12345.

Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.

This notice has been posted by System F.

State Water System ID# TM 1234586. Sent: 6/1/2010

Appendix A

Primacy Revision Crosswalk

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Summary of Federal Requirement	Federal Citation	State Citation (document title, page number, section/paragraph)	Different from Fed. requirement? (Explain on separate sheet)
Part 141–National Primary Drinking Water Regulations			
Subpart C–Monitoring and Analytical Requirements			
40 CFR 141.21 Coliform sampling.			
Sanitary surveys conducted by the State under the provisions of 40 CFR142.16(o)(2) of this chapter may be used to meet the sanitary survey requirements of this section.	40 CFR 141.21(d)(3)		
40 CFR 141.28 Certified laboratories.			
For the purpose of determining compliance with 40 CFR 141.21 through 141.27, 141.30, 141.40, 141.74, 141.89 and 141.402, samples may be considered only if they have been analyzed by a laboratory certified by the State except that measurements of alkalinity, calcium, conductivity, disinfectant residual, orthophosphate, pH, silica, temperature and turbidity may be performed by any person acceptable to the State.	40 CFR 141.28		

Summary of Federal Requirement	Federal Citation	State Citation (document title, page number, section/paragraph)	Different from Fed. requirement? (Explain on separate sheet)
Subpart O – Consumer confidence reports			
40 CFR 141.153 Content of the reports.			
Systems required to comply with subpart S. Any ground water system that receives notice from the State of a significant deficiency or notice from a laboratory of a fecal indicator-positive ground water source sample that is not invalidated by the State under 40 CFR 141.402(d) must inform its customers of any significant deficiency that is uncorrected at the time of the next report or of any fecal indicator-positive ground water source sample in the next report. The system must continue to inform the public annually until the State determines that particular significant deficiency is corrected or the fecal contamination in the ground water source is addressed under 40 CFR 141.403(a). Each report must include the following elements.	40 CFR 141.153 (h)(6)(i)		
The nature of the particular significant deficiency or the source of the fecal contamination (if the source is known) and the date the significant deficiency was identified by the State or the dates of the fecal indicator-positive ground water source samples;	40 CFR 141.153 (h)(6)(i)(A)		
If the fecal contamination in the ground water source has been addressed under 40 CFR 141.403(a) and the date of such action;	40 CFR 141.153 (h)(6)(i)(B)		
For each significant deficiency or fecal contamination in the ground water source that has not been addressed under 40 CFR 141.403(a), the State-approved plan and schedule for correction, including interim measures, progress to date, and any interim measures completed;	40 CFR 141.153 (h)(6)(i)(C)		

SUMMARY OF FEDERAL REQUIREMENT	FEDERAL CITATION	STATE CITATION (DOCUMENT TITLE, PAGE NUMBER, SECTION/PARAGRAPH)	DIFFERENT FROM FED. REQUIREMENT? (EXPLAIN ON SEPARATE SHEET)
If the system receives notice of a fecal indicator-positive ground water source sample that is not invalidated by the State under 40 CFR 141.402(d), the potential health effects using the health effects language of Appendix A of subpart O.	40 CFR 141.153 (h)(6)(i)(D)		
If directed by the State, a system with significant deficiencies that have been corrected before the next report is issued must inform its customers of the significant deficiency, how the deficiency was corrected, and the date of correction under paragraph (h)(6)(i) of this section.	40 CFR 141.153 (h)(6)(ii)		
APPENDIX A TO SUBPART O OF PART 141—REGULATING CONTAMINANTS.			
Appendix A to Subpart O is amended by adding a new entry "Fecal Indicators (enterococci or coliphage)" is added to read as follows:	Appendix A to Subpart O of Part 141		

Contaminant (units)	Traditional MCL in mg/L	To convert for CCR, multiply by	MCL in CCR units	MCLG	Major sources in drinking water	Health effects language
Microbiological Contaminants:						
Fecal Indicators (enterococci or coliphage).	TT…..	……..	TT…..	N/A….	Human and animal fecal waste.	Fecal indicators are microbes whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term health effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely compromised immune systems.
TT=Treatment Technique						

Summary of Federal Requirement	Federal Citation	State Citation (document title, page number, section/paragraph)	Different from Fed. requirement? (Explain on separate sheet)
Subpart Q–Public Notification Of Drinking Water Violations			
40 CFR 141.202 – Tier 1 Public Notice—Form, manner, and frequency of notice.			
This entry is redesignated as entry (9), and a new paragraph (8) is added to read as follows: Detection of *E. coli*, enterococci, or coliphage in source water samples as specified in 40 CFR 141.402 (a) and 40 CFR 141.402 (b).	40 CFR 141.202 (a) Table 1 (8)		
40 CFR 141.203 – Tier 2 Public Notice—Form, manner, and frequency of notice.			
Failure to take corrective action or failure to maintain at least 4-log treatment of viruses (using inactivation, removal, or a State-approved combination of 4-log virus inactivation and removal) before or at the first customer under 40 CFR 141.403 (a).	40 CFR 141.203 (a)(4)		

SUMMARY OF FEDERAL REQUIREMENT	FEDERAL CITATION	STATE CITATION (DOCUMENT TITLE, PAGE NUMBER, SECTION/PARAGRAPH)	DIFFERENT FROM FED. REQUIREMENT? (EXPLAIN ON SEPARATE SHEET)
APPENDIX A TO SUBPART Q OF PART 141—NPDWR VIOLATIONS AND OTHER SITUATIONS REQUIRING PUBLIC NOTICE[1]			
Entry I.A.11 is added; entry IV.F is redesignated as entry IV.G; and a new entry IV.F is added in alphabetical order, as listed in the following table:	Appendix A to Subpart Q of Part 141 I.A.11, IV.F, and IV.G		

Contaminant	MCL/MRDL/TT violations[2]		Monitoring and testing procedure violations	
	Tier of public notice required	Citation	Tier of public notice required	Citation
I. Violations of National Primary Drinking Water Regulations (NPDWR):[3] **A. Microbiological Contaminants**				
11. Ground Water Rule violations	2	141.404	3	141.402(h). 141.403(d).
IV. Other Situations Requiring Public Notification				
F. Source Water Sample Positive for GWR Fecal indicators: *E. coli*, enterococci, or coliphage	1	141.402(g)	N/A	N/A

1. Violations and other situations not listed in this table (e.g., failure to prepare Consumer Confidence Reports) do not require notice, unless otherwise determined by the primacy agency. Primacy agencies may, at their option, also require a more stringent public notice tier (e.g., Tier 1 instead of Tier 2 or Tier 2 instead of Tier 3) for specific violations and situations listed in this Appendix, as authorized under 40 CFR 141.202(a) and 40 CFR 141.203(a).
2. MCL—Maximum contaminant level, MRDL—Maximum residual disinfectant level, TT—Treatment technique.
3. The term Violations of National Primary Drinking Water Regulations (NPDWR) is used here to include violations of MCL, MRDL, treatment technique, monitoring, and testing procedure requirements.

SUMMARY OF FEDERAL REQUIREMENT	FEDERAL CITATION	STATE CITATION (DOCUMENT TITLE, PAGE NUMBER, SECTION/PARAGRAPH)	DIFFERENT FROM FED. REQUIREMENT? (EXPLAIN ON SEPARATE SHEET)
APPENDIX B TO SUBPART Q OF PART 141—STANDARD HEALTH EFFECTS LANGUAGE FOR PUBLIC NOTIFICATION			
Entries A.1.c and A.1.d are added in numerical order to read as follows:	Appendix B to Subpart Q of Part 141 A.1.c and A.1.d		

Contaminant	MCLG[1] mg/L	MCL[2] mg/L	Standard health effects language for public notification
National Primary Drinking Water Regulations (NPDWR) **A. Microbiological Contaminants**			
1c. Fecal indicators (GWR) i. *E. coli* ii. enterococci iii. coliphage	Zero None None	TT TT TT	Fecal indicators are microbes whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term health effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely compromised immune systems.
1d. Ground Water Rule (GWR) TT violations	None	TT	Inadequately treated or inadequately protected water may contain disease-causing organisms. These organisms can cause symptoms such as diarrhea, nausea, cramps, and associated headaches.

1. MCLG – Maximum contaminant level goal
2 .MCL – Maximum contaminant level

APPENDIX C TO SUBPART Q OF PART 141—LIST OF ACRONYMS USED IN PUBLIC NOTIFICATION REGULATIONS			
GWR Ground Water Rule	Appendix C to Subpart Q of Part 141		

SUMMARY OF FEDERAL REQUIREMENT	FEDERAL CITATION	STATE CITATION (DOCUMENT TITLE, PAGE NUMBER, SECTION/PARAGRAPH)	DIFFERENT FROM FED. REQUIREMENT? (EXPLAIN ON SEPARATE SHEET)
SUBPART S–GROUND WATER RULE			
40 CFR 141.400 GENERAL REQUIREMENTS AND APPLICABILITY.			
Scope of this subpart. The requirements of this subpart S constitute National Primary Drinking Water Regulations.	40 CFR 141.400 (a)		
Applicability. This subpart applies to all public water systems that use ground water except that it does not apply to public water systems that combine all of their ground water with surface water or with ground water under the direct influence of surface water prior to treatment under subpart H. For the purposes of this subpart, "ground water system" is defined as any public water system meeting this applicability statement, including consecutive systems receiving finished ground water.	40 CFR 141.400 (b)		
General Requirements. Systems subject to this subpart must comply with the following requirements:	40 CFR 141.400 (c)		
Sanitary survey information requirements for all ground water systems as described in 40 CFR 141.401.	40 CFR 141.400 (c)(1)		
Microbial source water monitoring requirements for ground water systems that do not treat all of their ground water to at least 99.99 percent (4-log) treatment of viruses (using inactivation, removal, or a State-approved combination of 4-log virus inactivation and removal) before or at the first customer as described in 40 CFR 141.402.	40 CFR 141.400 (c)(2)		

SUMMARY OF FEDERAL REQUIREMENT	FEDERAL CITATION	STATE CITATION (DOCUMENT TITLE, PAGE NUMBER, SECTION/PARAGRAPH)	DIFFERENT FROM FED. REQUIREMENT? (EXPLAIN ON SEPARATE SHEET)
Treatment technique requirements, described in 40 CFR 141.403, that apply to ground water systems that have fecally contaminated source waters, as determined by source water monitoring conducted under 40 CFR 141.402, or that have significant deficiencies that are identified by the State or that are identified by EPA under SDWA section 1445. A ground water system with fecally contaminated source water or with significant deficiencies subject to the treatment technique requirements of this subpart must implement one or more of the following corrective action options: correct all significant deficiencies; provide an alternate source of water; eliminate the source of contamination; or provide treatment that reliably achieves at least 4-log treatment of viruses (using inactivation, removal, or a State-approved combination of 4-log virus inactivation and removal) before or at the first customer.	40 CFR 141.400 (c)(3)		
Ground water systems that provide at least 4-log treatment of viruses (using inactivation, removal, or a State-approved combination of 4-log virus inactivation and removal) before or at the first customer are required to conduct compliance monitoring to demonstrate treatment effectiveness, as described in 40 CFR 141.403(b).	40 CFR 141.400 (c)(4)		
If requested by the State, ground water systems must provide the State with any existing information that will enable the State to perform a hydrogeologic sensitivity assessment. For the purposes of this subpart, “hydrogeologic sensitivity assessment” is a determination of whether ground water systems obtain water from hydrogeologically sensitive settings.	40 CFR 141.400 (c)(5)		

SUMMARY OF FEDERAL REQUIREMENT	FEDERAL CITATION	STATE CITATION (DOCUMENT TITLE, PAGE NUMBER, SECTION/PARAGRAPH)	DIFFERENT FROM FED. REQUIREMENT? (EXPLAIN ON SEPARATE SHEET)
Compliance date. Ground water systems must comply, unless otherwise noted, with the requirements of this subpart beginning December 1, 2009.	40 CFR 141.400 (d)		
40 CFR 141.401 SANITARY SURVEYS FOR GROUND WATER SYSTEMS.			
Ground water systems must provide the State, at the State's request, any existing information that will enable the State to conduct a sanitary survey.	40 CFR 141.401 (a)		
For the purposes of this subpart, a "sanitary survey," as conducted by the State, includes but is not limited to, an onsite review of the water source(s) (identifying sources of contamination by using results of source water assessments or other relevant information where available), facilities, equipment, operation, maintenance, and monitoring compliance of a public water system to evaluate the adequacy of the system, its sources and operations and the distribution of safe drinking water.	40 CFR 141.401 (b)		
The sanitary survey must include an evaluation of the applicable components listed in paragraphs (c)(1) through (8) of this section:	40 CFR 141.401 (c)		
(1) Source,	40 CFR 141.401 (c)(1)		
(2) Treatment,	40 CFR 141.401 (c)(2)		
(3) Distribution system,	40 CFR 141.401 (c)(3)		
(4) Finished water storage,	40 CFR 141.401 (c)(4)		
(5) Pumps, pump facilities, and controls,	40 CFR 141.401 (c)(5)		
(6) Monitoring, reporting, and data verification,	40 CFR 141.401 (c)(6)		
(7) System management and operation, and	40 CFR 141.401 (c)(7)		
(8) Operator compliance with State requirements.	40 CFR 141.401 (c)(8)		

SUMMARY OF FEDERAL REQUIREMENT	FEDERAL CITATION	STATE CITATION (DOCUMENT TITLE, PAGE NUMBER, SECTION/PARAGRAPH)	DIFFERENT FROM FED. REQUIREMENT? (EXPLAIN ON SEPARATE SHEET)
40 CFR 141.402 GROUND WATER SOURCE MICROBIAL MONITORING AND ANALYTCAL METHODS.			
Triggered source water monitoring.—(1) General requirements. A ground water system must conduct triggered source water monitoring if the conditions identified in paragraphs (a)(1)(i) and (a)(1)(ii) of this section exist.	40 CFR 141.402 (a)		
The system does not provide at least 4-log treatment of viruses (using inactivation, removal, or a State-approved combination of 4-log virus inactivation and removal) before or at the first customer for each ground water source; and	40 CFR 141.402 (a)(1)(i)		
The system is notified that a sample collected under 40 CFR 141.21(a) is total coliform-positive and the sample is not invalidated under 40 CFR 141.21(c).	40 CFR 141.402 (a)(1)(ii)		
Sampling Requirements. A ground water system must collect, within 24 hours of notification of the total coliform-positive sample, at least one ground water source sample from each ground water source in use at the time the total coliform-positive sample was collected under 40 CFR 141.21(a), except as provided in paragraph (a)(2)(ii) of this section.	40 CFR 141.402 (a)(2)		
The State may extend the 24-hour time limit on a case-by-case basis if the system cannot collect the ground water source water sample within 24 hours due to circumstances beyond its control. In the case of an extension, the State must specify how much time the system has to collect the sample.	40 CFR 141.402 (a)(2)(i)		

SUMMARY OF FEDERAL REQUIREMENT	FEDERAL CITATION	STATE CITATION (DOCUMENT TITLE, PAGE NUMBER, SECTION/PARAGRAPH)	DIFFERENT FROM FED. REQUIREMENT? (EXPLAIN ON SEPARATE SHEET)
If approved by the State, systems with more than one ground water source may meet the requirements of this paragraph (a)(2) by sampling a representative ground water source or sources. If directed by the State, systems must submit for State approval a triggered source water monitoring plan that identifies one or more ground water sources that are representative of each monitoring site in the system's sample siting plan under 40 CFR 141.21(a) and that the system intends to use for representative sampling under this paragraph.	40 CFR 141.402 (a)(2)(ii)		
A ground water system serving 1,000 people or fewer may use a repeat sample collected from a ground water source to meet both the requirements of 40 CFR 141.21(b) and to satisfy the monitoring requirements of paragraph (a)(2) of this section for that ground water source only if the State approves the use of *E. coli* as a fecal indicator for source water monitoring under this paragraph (a). If the repeat sample collected from the ground water source is *E. coli* positive, the system must comply with paragraph (a)(3) of this section.	40 CFR 141.402 (a)(2)(iii)		
Additional Requirements. If the State does not require corrective action under 40 CFR 141.403(a)(2) for a fecal indicator-positive source water sample collected under paragraph (a)(2) of this section that is not invalidated under paragraph (d) of this section, the system must collect five additional source water samples from the same source within 24 hours of being notified of the fecal indicator-positive sample.	40 CFR 141.402 (a)(3)		

SUMMARY OF FEDERAL REQUIREMENT	FEDERAL CITATION	STATE CITATION (DOCUMENT TITLE, PAGE NUMBER, SECTION/PARAGRAPH)	DIFFERENT FROM FED. REQUIREMENT? (EXPLAIN ON SEPARATE SHEET)
Consecutive and Wholesale Systems. In addition to the other requirements of this paragraph (a), a consecutive ground water system that has a total coliform-positive sample collected under 40 CFR 141.21(a) must notify the wholesale system(s) within 24 hours of being notified of the total coliform-positive sample.	40 CFR 141.402 (a)(4)(i)		
In addition to the other requirements of this paragraph (a), a wholesale ground water system must comply with paragraphs (a)(4)(ii)(A) and (a)(4)(ii)(B) of this section.	40 CFR 141.402 (a)(4)(ii)		
A wholesale ground water system that receives notice from a consecutive system it serves that a sample collected under 40 CFR 141.21(a) is total coliform-positive must, within 24 hours of being notified, collect a sample from its ground water source(s) under paragraph (a)(2) of this section and analyze it for a fecal indicator under paragraph (c) of this section.	40 CFR 141.402 (a)(4)(ii)(A)		
If the sample collected under paragraph (a)(4)(ii)(A) of this section is fecal indicator-positive, the wholesale ground water system must notify all consecutive systems served by that ground water source of the fecal indicator source water positive within 24 hours of being notified of the ground water source sample monitoring result and must meet the requirements of paragraph (a)(3) of this section.	40 CFR 141.402 (a)(4)(ii)(B)		
Exceptions to the Triggered Source Water Monitoring Requirements. A ground water system is not required to comply with the source water monitoring requirements of paragraph (a) of this section if either of the following conditions exists:	40 CFR 141.402 (a)(5)		

SUMMARY OF FEDERAL REQUIREMENT	FEDERAL CITATION	STATE CITATION (DOCUMENT TITLE, PAGE NUMBER, SECTION/PARAGRAPH)	DIFFERENT FROM FED. REQUIREMENT? (EXPLAIN ON SEPARATE SHEET)
The State determines, and documents in writing, that the total coliform-positive sample collected under 40 CFR 141.21(a) is caused by a distribution system deficiency; or	40 CFR 141.402 (a)(5)(i)		
The total coliform-positive sample collected under 40 CFR 141.21(a) is collected at a location that meets State criteria for distribution system conditions that will cause total coliform-positive samples.	40 CFR 141.402 (a)(5)(ii)		
Assessment Source Water Monitoring. If directed by the State, ground water systems must conduct assessment source water monitoring that meets State-determined requirements for such monitoring. A ground water system conducting assessment source water monitoring may use a triggered source water sample collected under paragraph (a)(2) of this section to meet the requirements of paragraph (b) of this section. State-determined assessment source water monitoring requirements may include:	40 CFR 141.402 (b)		
Collection of a total of 12 ground water source samples that represent each month the system provides ground water to the public,	40 CFR 141.402 (b)(1)		
Collection of samples from each well unless the system obtains written State approval to conduct monitoring at one or more wells within the ground water system that are representative of multiple wells used by that system and that draw water from the same hydrogeologic setting,	40 CFR 141.402 (b)(2)		
Collection of a standard sample volume of at least 100 mL for fecal indicator analysis regardless of the fecal indicator or analytical method used,	40 CFR 141.402 (b)(3)		

SUMMARY OF FEDERAL REQUIREMENT	FEDERAL CITATION	STATE CITATION (DOCUMENT TITLE, PAGE NUMBER, SECTION/PARAGRAPH)	DIFFERENT FROM FED. REQUIREMENT? (EXPLAIN ON SEPARATE SHEET)
Analysis of all ground water source samples using one of the analytical methods listed in the in paragraph (c)(2) of this section for the presence of *E. coli*, enterococci, or coliphage,	40 CFR 141.402 (b)(4)		
Collection of ground water source samples at a location prior to any treatment of the ground water source unless the State approves a sampling location after treatment, and	40 CFR 141.402 (b)(5)		
Collection of ground water source samples at the well itself unless the system's configuration does not allow for sampling at the well itself and the State approves an alternate sampling location that is representative of the water quality of that well.	40 CFR 141.402 (b)(6)		
Analytical methods. A ground water system subject to the source water monitoring requirements of paragraph (a) of this section must collect a standard sample volume of at least 100 mL for fecal indicator analysis regardless of the fecal indicator or analytical method used.	40 CFR 141.402 (c)(1)		
A ground water system must analyze all ground water source samples collected under paragraph (a) of this section using one of the analytical methods listed in the following table in paragraph (c)(2) of this section for the presence of *E. coli*, enterococci, or coliphage:	40 CFR 141.402 (c)(2)		

SUMMARY OF FEDERAL REQUIREMENT	FEDERAL CITATION	STATE CITATION (DOCUMENT TITLE, PAGE NUMBER, SECTION/PARAGRAPH)	DIFFERENT FROM FED. REQUIREMENT? (EXPLAIN ON SEPARATE SHEET)

Analytical Methods for Source Water Monitoring

Fecal Indicator [1]	Methodology	Method citation
E. coli	Colilert[3] Colisure[3] Membrane Filter Method with MI Agar m-ColiBlue24 Test[5] E*Colite Test[6] EC-MUG[7] NA-MUG[7]	9223 B.[2] 9223 B.[2] EPA Method 1604.[4] 9221 F.[2] 9222 G.[2]
Enterococci	Multiple-Tube Technique Membrane Filter Technique Membrane Filter Technique Enterolert[9]	9230B.[2] 9230C. [2] EPA Method 1600.[8]
Coliphage	Two-Step Enrichment Presence-Absence Procedure Single Agar Layer Procedure	EPA Method 1601.[10] EPA Method 1602.[11]

Analyses must be conducted in accordance with the documents listed below. The Director of the Federal Register approves the incorporation by reference of the documents listed in footnotes 2–11 in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Copies of the documents may be obtained from the sources listed below. Copies may be inspected at EPA's Drinking Water Docket, EPA West, 1301 Constitution Avenue, NW., EPA West, Room B102, Washington DC 20460 (Telephone: 202–566–2426); or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202–741–6030, or go to: *http://www.archives.gov/federal_register/ code_of_federal_regulations/ibr_locations.html*.

1 The time from sample collection to initiation of analysis may not exceed 30 hours. The ground water system is encouraged but is not required to hold samples below 10°C during transit.

2 Methods are described in Standard Methods for the Examination of Water and Wastewater 20th edition (1998) and copies may be obtained from the American Public Health Association, 1015 Fifteenth Street, NW., Washington, DC 20005–2605.

3 Medium is available through IDEXX Laboratories, Inc., One IDEXX Drive, Westbrook, Maine 04092.

4 EPA Method 1604: Total Coliforms and *Escherichia coli* in Water by Membrane Filtration Using a Simultaneous Detection Technique (MI Medium); September 2002, EPA 821–R–02–024. Method is available at http://www.epa.gov/nerlcwww/1604sp02.pdf or from EPA's Water Resource Center (RC–4100T), 1200 Pennsylvania Avenue, NW., Washington, DC 20460.

5 A description of the m-ColiBlue24 Test, "Total Coliforms and *E. coli* Membrane Filtration Method with m-ColiBlue24® Broth," Method No. 10029 Revision 2, August 17, 1999, is available from Hach Company, 100 Dayton Ave., Ames, IA 50010 or from EPA's Water Resource Center (RC–4100T), 1200 Pennsylvania Avenue, NW., Washington, DC 20460.

6 A description of the E*Colite Test, "Charm E*Colite Presence/Absence Test for Detection and Identification of Coliform Bacteria and *Escherichia coli* in Drinking Water, January 9, 1998, is available from Charm Sciences, Inc., 659 Andover St., Lawrence, MA 01843–1032 or from EPA's Water Resource Center (RC–4100T), 1200 Pennsylvania Avenue, NW., Washington, DC 20460.

7 EC–MUG (Method 9221F) or NA–MUG (Method 9222G) can be used for *E. coli* testing step as described in 40 CFR 141.21(f)(6)(i) or (ii) after use of Standard Methods 9221 B, 9221 D, 9222 B, or 9222 C.

8 EPA Method 1600: Enterococci in Water by Membrane Filtration Using membrane-Enterococcus Indoxyl–b–D–Glucoside Agar (mEI) EPA 821–R–02–022 (September 2002) is an approved variation of Standard Method 9230C. The method is available at http://www.epa.gov/nerlcwww/ 1600sp02.pdf or from EPA's Water Resource Center (RC–4100T), 1200 Pennsylvania Avenue, NW., Washington, DC 20460. The holding time and temperature for ground water samples are specified in footnote 1 above, rather than as specified in Section 8 of EPA Method 1600.

9 Medium is available through IDEXX Laboratories, Inc., One IDEXX Drive, Westbrook, Maine 04092. Preparation and use of the medium is set forth in the article "Evaluation of Enterolert for Enumeration of Enterococci in Recreational Waters," by Budnick, G.E., Howard, R.T., and Mayo, D.R., 1996, Applied and Environmental Microbiology, 62:3881–3884.

10 EPA Method 1601: Male-specific (F+) and Somatic Coliphage in Water by Two-step Enrichment Procedure; April 2001, EPA 821–R–01–030. Method is available at http://www.epa.gov/nerlcwww/1601ap01.pdf or from EPA's Water Resource Center (RC–4100T), 1200 Pennsylvania Avenue, NW., Washington, DC 20460.

11 EPA Method 1602: Male-specific (F+) and Somatic Coliphage in Water by Single Agar Layer (SAL) Procedure; April 2001, EPA 821–R–01– 029. Method is available at http://www.epa.gov/nerlcwww/1602ap01.pdf or from EPA's Water Resource Center (RC–4100T), 1200 Pennsylvania Avenue, NW., Washington, DC 20460.

SUMMARY OF FEDERAL REQUIREMENT	FEDERAL CITATION	STATE CITATION (DOCUMENT TITLE, PAGE NUMBER, SECTION/PARAGRAPH)	DIFFERENT FROM FED. REQUIREMENT? (EXPLAIN ON SEPARATE SHEET)
Invalidation of a fecal indicator-positive ground water source sample. A ground water system may obtain State invalidation of a fecal indicator-positive ground water source sample collected under paragraph (a) of this section only under the conditions specified in paragraphs (d)(1)(i) and (ii) of this section.	40 CFR 141.402 (d)(1)		
The system provides the State with written notice from the laboratory that improper sample analysis occurred; or	40 CFR 141.402 (d)(1)(i)		
The State determines and documents in writing that there is substantial evidence that a fecal indicator-positive ground water source sample is not related to source water quality.	40 CFR 141.402 (d)(1)(ii)		
If the State invalidates a fecal indicator-positive ground water source sample, the ground water system must collect another source water sample under paragraph (a) of this section within 24 hours of being notified by the State of its invalidation decision and have it analyzed for the same fecal indicator using the analytical methods in paragraph (c) of this section. The State may extend the 24-hour time limit on a case-by-case basis if the system cannot collect the source water sample within 24 hours due to circumstances beyond its control. In the case of an extension, the State must specify how much time the system has to collect the sample.	40 CFR 141.402 (d)(2)		
Sampling location. Any ground water source sample required under paragraph (a) of this section must be collected at a location prior to any treatment of the ground water source unless the State approves a sampling location after treatment.	40 CFR 141.402 (e)(1)		

SUMMARY OF FEDERAL REQUIREMENT	FEDERAL CITATION	STATE CITATION (DOCUMENT TITLE, PAGE NUMBER, SECTION/PARAGRAPH)	DIFFERENT FROM FED. REQUIREMENT? (EXPLAIN ON SEPARATE SHEET)
If the system's configuration does not allow for sampling at the well itself, the system may collect a sample at a State-approved location to meet the requirements of paragraph (a) of this section if the sample is representative of the water quality of that well.	40 CFR 141.402 (e)(2)		
New Sources. If directed by the State, a ground water system that places a new ground water source into service after November 30, 2009, must conduct assessment source water monitoring under paragraph (b) of this section. If directed by the State, the system must begin monitoring before the ground water source is used to provide water to the public.	40 CFR 141.402 (f)		
Public Notification. A ground water system with a ground water source sample collected under paragraph (a) or (b) of this section that is fecal indicator-positive and that is not invalidated under paragraph (d) of this section, including consecutive systems served by the ground water source, must conduct public notification under 40 CFR 141.202.	40 CFR 141.402 (g)		
Monitoring Violations. Failure to meet the requirements of paragraphs (a)–(f) of this section is a monitoring violation and requires the ground water system to provide public notification under 40 CFR 141.204.	40 CFR 141.402 (h)		
40 CFR 141.403 TREATMENT TECHNIQUE REQUIREMENTS FOR GROUND WATER SYSTEMS.			
Ground water systems with significant deficiencies or source water fecal contamination. The treatment technique requirements of this section must be met by ground water systems when a significant deficiency is identified or when a ground water source sample collected under 40 CFR 141.402(a)(3) is fecal indicator-positive.	40 CFR 141.403 (a)(1)		

SUMMARY OF FEDERAL REQUIREMENT	FEDERAL CITATION	STATE CITATION (DOCUMENT TITLE, PAGE NUMBER, SECTION/PARAGRAPH)	DIFFERENT FROM FED. REQUIREMENT? (EXPLAIN ON SEPARATE SHEET)
If directed by the State, a ground water system with a ground water source sample collected under 40 CFR 141.402(a)(2), 40 CFR 141.402(a)(4), or 40 CFR 141.402(b) that is fecal indicator-positive must comply with the treatment technique requirements of this section.	40 CFR 141.403 (a)(2)		
When a significant deficiency is identified at a Subpart H public water system that uses both ground water and surface water or ground water under the direct influence of surface water, the system must comply with provisions of this paragraph except in cases where the State determines that the significant deficiency is in a portion of the distribution system that is served solely by surface water or ground water under the direct influence of surface water.	40 CFR 141.403 (a)(3)		
Unless the State directs the ground water system to implement a specific corrective action, the ground water system must consult with the State regarding the appropriate corrective action within 30 days of receiving written notice from the State of a significant deficiency, written notice from a laboratory that a ground water source sample collected under 40 CFR 141.402(a)(3) was found to be fecal indicator-positive, or direction from the State that a fecal indicator-positive collected under 40 CFR 141.402(a)(2), 40 CFR 141.402(a)(4), or 40 CFR 141.402(b) requires corrective action. For the purposes of this subpart, significant deficiencies include, but are not limited to, defects in design, operation, or maintenance, or a failure or malfunction of the sources, treatment, storage, or distribution system that the State determines to be causing, or have potential for causing, the introduction of contamination into the water delivered to consumers.	40 CFR 141.403 (a)(4)		

SUMMARY OF FEDERAL REQUIREMENT	FEDERAL CITATION	STATE CITATION (DOCUMENT TITLE, PAGE NUMBER, SECTION/PARAGRAPH)	DIFFERENT FROM FED. REQUIREMENT? (EXPLAIN ON SEPARATE SHEET)
Within 120 days (or earlier if directed by the State) of receiving written notification from the State of a significant deficiency, written notice from a laboratory that a ground water source sample collected under 40 CFR 141.402(a)(3) was found to be fecal indicator-positive, or direction from the State that a fecal indicator-positive sample collected under 40 CFR 141.402(a)(2), 40 CFR 141.402(a)(4), or 40 CFR 141.402(b) requires corrective action, the ground water system must either:	40 CFR 141.403 (a)(5)		
Have completed corrective action in accordance with applicable State plan review processes or other State guidance or direction, if any, including State-specified interim measures; or	40 CFR 141.403 (a)(5)(i)		
Be in compliance with a State-approved corrective action plan and schedule subject to the conditions specified in paragraphs (a)(5)(ii)(A) and (a)(5)(ii)(B) of this section.	40 CFR 141.403 (a)(5)(ii)		
Any subsequent modifications to a State-approved corrective action plan and schedule must also be approved by the State.	40 CFR 141.403 (a)(5)(ii)(A)		
If the State specifies interim measures for protection of the public health pending State approval of the corrective action plan and schedule or pending completion of the corrective action plan, the system must comply with these interim measures as well as with any schedule specified by the State.	40 CFR 141.403 (a)(5)(ii)(B)		
Corrective Action Alternatives. Ground water systems that meet the conditions of paragraph (a)(1) or (a)(2) of this section must implement one or more of the following corrective action alternatives:	40 CFR 141.403 (a)(6)		
Correct all significant deficiencies;	40 CFR 141.403 (a)(6)(i)		

SUMMARY OF FEDERAL REQUIREMENT	FEDERAL CITATION	STATE CITATION (DOCUMENT TITLE, PAGE NUMBER, SECTION/PARAGRAPH)	DIFFERENT FROM FED. REQUIREMENT? (EXPLAIN ON SEPARATE SHEET)
Provide an alternate source of water;	40 CFR 141.403 (a)(6)(ii)		
Eliminate the source of contamination; or	40 CFR 141.403 (a)(6)(iii)		
Provide treatment that reliably achieves at least 4-log treatment of viruses (using inactivation, removal, or a State-approved combination of 4-log virus inactivation and removal) before or at the first customer for the ground water source.	40 CFR 141.403 (a)(6)(iv)		
Special notice to the public of significant deficiencies or source water fecal contamination. In addition to the applicable public notification requirements of 40 CFR 141.202, a community ground water system that receives notice from the State of a significant deficiency or notification of a fecal indicator-positive ground water source sample that is not invalidated by the State under 40 CFR 141.402(d) must inform the public served by the water system under 40 CFR 141.153(h)(6) of the fecal indicator-positive source sample or of any significant deficiency that has not been corrected. The system must continue to inform the public annually until the significant deficiency is corrected or the fecal contamination in the ground water source is determined by the State to be corrected under paragraph (a)(5) of this section.	40 CFR 141.403 (a)(7)(i)		

SUMMARY OF FEDERAL REQUIREMENT	FEDERAL CITATION	STATE CITATION (DOCUMENT TITLE, PAGE NUMBER, SECTION/PARAGRAPH)	DIFFERENT FROM FED. REQUIREMENT? (EXPLAIN ON SEPARATE SHEET)
In addition to the applicable public notification requirements of 40 CFR 141.202, a non-community ground water system that receives notice from the State of a significant deficiency must inform the public served by the water system in a manner approved by the State of any significant deficiency that has not been corrected within 12 months of being notified by the State, or earlier if directed by the State. The system must continue to inform the public annually until the significant deficiency is corrected. The information must include:	40 CFR 141.403 (a)(7)(ii)		
The nature of the significant deficiency and the date the significant deficiency was identified by the State;	40 CFR 141.403 (a)(7)(ii)(A)		
The State-approved plan and schedule for correction of the significant deficiency, including interim measures, progress to date, and any interim measures completed; and	40 CFR 141.403 (a)(7)(ii)(B)		
For systems with a large proportion of non-English speaking consumers, as determined by the State, information in the appropriate language(s) regarding the importance of the notice or a telephone number or address where consumers may contact the system to obtain a translated copy of the notice or assistance in the appropriate language.	40 CFR 141.403 (a)(7)(ii)(C)		
If directed by the State, a non-community water system with significant deficiencies that have been corrected must inform its customers of the significant deficiencies, how the deficiencies were corrected, and the dates of correction under paragraph (a)(7)(ii) of this section.	40 CFR 141.403 (a)(7)(iii)		

SUMMARY OF FEDERAL REQUIREMENT	FEDERAL CITATION	STATE CITATION (DOCUMENT TITLE, PAGE NUMBER, SECTION/PARAGRAPH)	DIFFERENT FROM FED. REQUIREMENT? (EXPLAIN ON SEPARATE SHEET)
Compliance monitoring. Existing ground water sources. A ground water system that is not required to meet the source water monitoring requirements of this subpart for any ground water source because it provides at least 4-log treatment of viruses (using inactivation, removal, or a State-approved combination of 4-log virus inactivation and removal) before or at the first customer for any ground water source before December 1, 2009, must notify the State in writing that it provides at least 4-log treatment of viruses (using inactivation, removal, or a State-approved combination of 4-log virus inactivation and removal) before or at the first customer for the specified ground water source and begin compliance monitoring in accordance with paragraph (b)(3) of this section by December 1, 2009. Notification to the State must include engineering, operational, or other information that the State requests to evaluate the submission. If the system subsequently discontinues 4-log treatment of viruses (using inactivation, removal, or a State-approved combination of 4-log virus inactivation and removal) before or at the first customer for a ground water source, the system must conduct ground water source monitoring as required under 40 CFR 141.402.	40 CFR 141.403 (b)(1)		
New ground water sources. A ground water system that places a ground water source in service after November 30, 2009, that is not required to meet the source water monitoring requirements of this subpart because the system provides at least 4-log treatment of viruses (using inactivation, removal, or a State-approved combination of 4-log virus inactivation and removal) before or at the first customer for the ground water source must comply with the requirements of paragraphs (b)(2)(i), (b)(2)(ii) and (b)(2)(iii) of this section.	40 CFR 141.403 (b)(2)		

SUMMARY OF FEDERAL REQUIREMENT	FEDERAL CITATION	STATE CITATION (DOCUMENT TITLE, PAGE NUMBER, SECTION/PARAGRAPH)	DIFFERENT FROM FED. REQUIREMENT? (EXPLAIN ON SEPARATE SHEET)
The system must notify the State in writing that it provides at least 4-log treatment of viruses (using inactivation, removal, or a State-approved combination of 4-log virus inactivation and removal) before or at the first customer for the ground water source. Notification to the State must include engineering, operational, or other information that the State requests to evaluate the submission.	40 CFR 141.403 (b)(2)(i)		
The system must conduct compliance monitoring as required under 40 CFR 141.403(b)(3) of this subpart within 30 days of placing the source in service.	40 CFR 141.403 (b)(2)(ii)		
The system must conduct ground water source monitoring under 40 CFR 141.402 if the system subsequently discontinues 4-log treatment of viruses (using inactivation, removal, or a State-approved combination of 4-log virus inactivation and removal) before or at the first customer for the ground water source.	40 CFR 141.403 (b)(2)(iii)		
Monitoring requirements. A ground water system subject to the requirements of paragraphs (a), (b)(1) or (b)(2) of this section must monitor the effectiveness and reliability of treatment for that ground water source before or at the first customer as follows:	40 CFR 141.403 (b)(3)		

SUMMARY OF FEDERAL REQUIREMENT	FEDERAL CITATION	STATE CITATION (DOCUMENT TITLE, PAGE NUMBER, SECTION/PARAGRAPH)	DIFFERENT FROM FED. REQUIREMENT? (EXPLAIN ON SEPARATE SHEET)
Chemical disinfection. Ground water systems serving greater than 3,300 people. A ground water system that serves greater than 3,300 people must continuously monitor the residual disinfectant concentration using analytical methods specified in 40 CFR 141.74(a)(2) at a location approved by the State and must record the lowest residual disinfectant concentration each day that water from the ground water source is served to the public. The ground water system must maintain the State-determined residual disinfectant concentration every day the ground water system serves water from the ground water source to the public. If there is a failure in the continuous monitoring equipment, the ground water system must conduct grab sampling every four hours until the continuous monitoring equipment is returned to service. The system must resume continuous residual disinfectant monitoring within 14 days.	40 CFR 141.403 (b)(3)(i)(A)		

SUMMARY OF FEDERAL REQUIREMENT	FEDERAL CITATION	STATE CITATION (DOCUMENT TITLE, PAGE NUMBER, SECTION/PARAGRAPH)	DIFFERENT FROM FED. REQUIREMENT? (EXPLAIN ON SEPARATE SHEET)
Ground water systems serving 3,300 or fewer people. A ground water system that serves 3,300 or fewer people must monitor the residual disinfectant concentration using analytical methods specified in 40 CFR 141.74(a)(2) at a location approved by the State and record the residual disinfection concentration each day that water from the ground water source is served to the public. The ground water system must maintain the State-determined residual disinfectant concentration every day the ground water system serves water from the ground water source to the public. The ground water system must take a daily grab sample during the hour of peak flow or at another time specified by the State. If any daily grab sample measurement falls below the State-determined residual disinfectant concentration, the ground water system must take follow-up samples every four hours until the residual disinfectant concentration is restored to the State-determined level. Alternatively, a ground water system that serves 3,300 or fewer people may monitor continuously and meet the requirements of paragraph (b)(3)(i)(A) of this section.	40 CFR 141.403 (b)(3)(i)(B)		
Membrane filtration. A ground water system that uses membrane filtration to meet the requirements of this subpart must monitor the membrane filtration process in accordance with all State-specified monitoring requirements and must operate the membrane filtration in accordance with all State-specified compliance requirements. A ground water system that uses membrane filtration is in compliance with the requirement to achieve at least 4-log removal of viruses when:	40 CFR 141.403 (b)(3)(ii)		

SUMMARY OF FEDERAL REQUIREMENT	FEDERAL CITATION	STATE CITATION (DOCUMENT TITLE, PAGE NUMBER, SECTION/PARAGRAPH)	DIFFERENT FROM FED. REQUIREMENT? (EXPLAIN ON SEPARATE SHEET)
The membrane has an absolute molecular weight cut-off (MWCO), or an alternate parameter that describes the exclusion characteristics of the membrane, that can reliably achieve at least 4-log removal of viruses;	40 CFR 141.403 (b)(3)(ii)(A)		
The membrane process is operated in accordance with State-specified compliance requirements; and	40 CFR 141.403 (b)(3)(ii)(B)		
The integrity of the membrane is intact.	40 CFR 141.403 (b)(3)(ii)(C)		
Alternative treatment. A ground water system that uses a State-approved alternative treatment to meet the requirements of this subpart by providing at least 4-log treatment of viruses (using inactivation, removal, or a State-approved combination of 4-log virus inactivation and removal) before or at the first customer must:	40 CFR 141.403 (b)(3)(iii)		
Monitor the alternative treatment in accordance with all State-specified monitoring requirements; and	40 CFR 141.403 (b)(3)(iii)(A)		
Operate the alternative treatment in accordance with all compliance requirements that the State determines to be necessary to achieve at least 4-log treatment of viruses.	40 CFR 141.403 (b)(3)(iii)(B)		
Discontinuing treatment. A ground water system may discontinue 4-log treatment of viruses (using inactivation, removal, or a State-approved combination of 4-log virus inactivation and removal) before or at the first customer for a ground water source if the State determines and documents in writing that 4-log treatment of viruses is no longer necessary for that ground water source. A system that discontinues 4-log treatment of viruses is subject to the source water monitoring and analytical methods requirements of 40 CFR 141.402 of this subpart.	40 CFR 141.403 (c)		

SUMMARY OF FEDERAL REQUIREMENT	FEDERAL CITATION	STATE CITATION (DOCUMENT TITLE, PAGE NUMBER, SECTION/PARAGRAPH)	DIFFERENT FROM FED. REQUIREMENT? (EXPLAIN ON SEPARATE SHEET)
Failure to meet the monitoring requirements of paragraph (b) of this section is a monitoring violation and requires the ground water system to provide public notification under 40 CFR 141.204.	40 CFR 141.403 (d)		
40 CFR 141.404 TREATMENT TECHNIQUE VIOLATIONS FOR GROUND WATER SYSTEMS.			
A ground water system with a significant deficiency is in violation of the treatment technique requirement if, within 120 days (or earlier if directed by the State) of receiving written notice from the State of the significant deficiency, the system:	40 CFR 141.404 (a)		
Does not complete corrective action in accordance with any applicable State plan review processes or other State guidance and direction, including State specified interim actions and measures, or	40 CFR 141.404 (a)(1)		
Is not in compliance with a State-approved corrective action plan and schedule.	40 CFR 141.404 (a)(2)		
Unless the State invalidates a fecal indicator-positive ground water source sample under 40 CFR 141.402(d), a ground water system is in violation of the treatment technique requirement if, within 120 days (or earlier if directed by the State) of meeting the conditions of 40 CFR 141.403(a)(1) or 40 CFR 141.403(a)(2), the system:	40 CFR 141.404 (b)		
Does not complete corrective action in accordance with any applicable State plan review processes or other State guidance and direction, including State-specified interim measures, or	40 CFR 141.404 (b)(1)		
Is not in compliance with a State-approved corrective action plan and schedule.	40 CFR 141.404 (b)(2)		

SUMMARY OF FEDERAL REQUIREMENT	FEDERAL CITATION	STATE CITATION (DOCUMENT TITLE, PAGE NUMBER, SECTION/PARAGRAPH)	DIFFERENT FROM FED. REQUIREMENT? (EXPLAIN ON SEPARATE SHEET)
A ground water system subject to the requirements of 40 CFR 141.403(b)(3) that fails to maintain at least 4-log treatment of viruses (using inactivation, removal, or a State-approved combination of 4-log virus inactivation and removal) before or at the first customer for a ground water source is in violation of the treatment technique requirement if the failure is not corrected within four hours of determining the system is not maintaining at least 4-log treatment of viruses before or at the first customer.	40 CFR 141.404 (c)		
Ground water system must give public notification under 40 CFR 141.203 for the treatment technique violations specified in paragraphs (a), (b) and (c) of this section.	40 CFR 141.404 (d)		
40 CFR 141.405 REPORTING AND RECORDKEEPING FOR GROUND WATER SYSTEMS.			
Reporting. In addition to the requirements of 40 CFR 141.31, a ground water system regulated under this subpart must provide the following information to the State:	40 CFR 141.405 (a)		
A ground water system conducting compliance monitoring under 40 CFR 141.403(b) must notify the State any time the system fails to meet any State-specified requirements including, but not limited to, minimum residual disinfectant concentration, membrane operating criteria or membrane integrity, and alternative treatment operating criteria, if operation in accordance with the criteria or requirements is not restored within four hours. The ground water system must notify the State as soon as possible, but in no case later than the end of the next business day.	40 CFR 141.405 (a)(1)		
After completing any corrective action under 40 CFR 141.403(a), a ground water system must notify the State within 30 days of completion of the corrective action.	40 CFR 141.405 (a)(2)		

SUMMARY OF FEDERAL REQUIREMENT	FEDERAL CITATION	STATE CITATION (DOCUMENT TITLE, PAGE NUMBER, SECTION/PARAGRAPH)	DIFFERENT FROM FED. REQUIREMENT? (EXPLAIN ON SEPARATE SHEET)
If a ground water system subject to the requirements of 40 CFR 141.402(a) does not conduct source water monitoring under 40 CFR 141.402(a)(5)(ii), the system must provide documentation to the State within 30 days of the total coliform positive sample that it met the State criteria.	40 CFR 141.405 (a)(3)		
Recordkeeping. In addition to the requirements of 40 CFR 141.33, a ground water system regulated under this subpart must maintain the following information in its records:	40 CFR 141.405 (b)		
Documentation of corrective actions. Documentation shall be kept for a period of not less than ten years.	40 CFR 141.405 (b)(1)		
Documentation of notice to the public as required under 40 CFR 141.403(a)(7). Documentation shall be kept for a period of not less than three years.	40 CFR 141.405 (b)(2)		
Records of decisions under 40 CFR 141.402(a)(5)(ii) and records of invalidation of fecal indicator-positive ground water source samples under 40 CFR 141.402(d). Documentation shall be kept for a period of not less than five years.	40 CFR 141.405 (b)(3)		
For consecutive systems, documentation of notification to the wholesale system(s) of total-coliform positive samples that are not invalidated under 40 CFR 141.21(c). Documentation shall be kept for a period of not less than five years.	40 CFR 141.405 (b)(4)		
For systems, including wholesale systems, that are required to perform compliance monitoring under 40 CFR 141.403(b):	40 CFR 141.405 (b)(5)		
Records of the State-specified minimum disinfectant residual. Documentation shall be kept for a period of not less than ten years.	40 CFR 141.405 (b)(5)(i)		

SUMMARY OF FEDERAL REQUIREMENT	FEDERAL CITATION	STATE CITATION (DOCUMENT TITLE, PAGE NUMBER, SECTION/PARAGRAPH)	DIFFERENT FROM FED. REQUIREMENT? (EXPLAIN ON SEPARATE SHEET)
Records of the lowest daily residual disinfectant concentration and records of the date and duration of any failure to maintain the State-prescribed minimum residual disinfectant concentration for a period of more than four hours. Documentation shall be kept for a period of not less than five years.	40 CFR 141.405 (b)(5)(ii)		
Records of State-specified compliance requirements for membrane filtration and of parameters specified by the State for State-approved alternative treatment and records of the date and duration of any failure to meet the membrane operating, membrane integrity, or alternative treatment operating requirements for more than four hours. Documentation shall be kept for a period of not less than five years.	40 CFR 141.405 (b)(5)(iii)		

SUMMARY OF FEDERAL REQUIREMENT	FEDERAL CITATION	EXPLANATION OF STATE POLICIES AND PROCEDURES
PART 142–NATIONAL PRIMARY DRINKING WATER REGULATIONS IMPLEMENTATION		
SUBPART B–PRIMARY ENFORCEMENT RESPONSIBILITY		
40 CFR 142.14 RECORDS KEPT BY STATES.		
Records of the currently applicable or most recent State determination, including all supporting information and an explanation of the technical basis of each decision, made under the following provisions of 40 CFR part 141, subpart S and 40 CFR part 142.	40 CFR 142.14 (d)(17)	
40 CFR 142.16(o)(2)(v). Records of written notices of significant deficiencies.	40 CFR 142.14 (d)(17)(i)	
40 CFR 141.403(a)(5)(ii) of this chapter. Records of corrective action plans, schedule approvals, and State-specified interim measures.	40 CFR 142.14 (d)(17)(ii)	
40 CFR 142.16(o)(4). Records of confirmations under 40 CFR 141.403(a) of this chapter that a significant deficiency has been corrected or the fecal contamination in the ground water source has been addressed.	40 CFR 142.14 (d)(17)(iii)	
40 CFR 141.402(a)(5) of this chapter. Records of State determinations and records of ground water system's documentation for not conducting triggered source water monitoring.	40 CFR 142.14 (d)(17)(iv)	
40 CFR 141.402(d) of this chapter. Records of invalidations of fecal indicator-positive ground water source samples.	40 CFR 142.14 (d)(17)(v)	
40 CFR 141.402(a)(2)(ii) of this chapter. Records of State approvals of source water monitoring plans.	40 CFR 142.14 (d)(17)(vi)	
40 CFR 142.16(o)(4)(ii). Records of notices of the minimum residual disinfection concentration (when using chemical disinfection) needed to achieve at least 4-log virus inactivation before or at the first customer.	40 CFR 142.14 (d)(17)(vii)	

SUMMARY OF FEDERAL REQUIREMENT	FEDERAL CITATION	EXPLANATION OF STATE POLICIES AND PROCEDURES
40 CFR 142.16(o)(4)(iv) and 142.16(o)(4)(v) Records of notices of the State-specified monitoring and compliance requirements (when using membrane filtration or alternative treatment) needed to achieve at least 4-log treatment of viruses (using inactivation, removal, or a State-approved combination of 4-log inactivation and removal) before or at the first customer.	40 CFR 142.14 (d)(17)(viii)	
40 CFR 141.403(b)(1) and 141.403(b)(2) of this chapter. Records of written notices from the ground water system that it provides at least 4-log treatment of viruses (using inactivation, removal, or a State-approved combination of 4-log virus inactivation and removal) before or at the first customer for a ground water source.	40 CFR 142.14 (d)(17)(ix)	
40 CFR 142.16(o)(4)(vi). Records of written determinations that the ground water system may discontinue 4-log treatment of viruses (using inactivation, removal, or a State-approved combination of 4-log inactivation and removal).	40 CFR 142.14 (d)(17)(x)	
40 CFR 142.15 REPORTS BY STATES.		
Ground water rule. *Sanitary surveys.* The month and year in which the most recent sanitary survey was completed or, for a State that uses a phased review process, the date the last element of the applicable eight elements was evaluated under 40 CFR 142.16(o)(2) for each ground water system.	40 CFR 142.15 (c)(7)(i)	
Corrective action requirements. For any corrective action under 40 CFR 141.403(a) of this chapter, the date the ground water system completed corrective action.	40 CFR 142.15 (c)(7)(ii)	
Compliance monitoring. All ground water systems providing at least 4-log treatment of viruses (using inactivation, removal, or a State-approved combination of 4-log virus inactivation and removal) before or at the first customer for any ground water source(s).	40 CFR 142.15 (c)(7)(iii)	

SUMMARY OF FEDERAL REQUIREMENT	FEDERAL CITATION	EXPLANATION OF STATE POLICIES AND PROCEDURES
40 CFR 142.16 SPECIAL PRIMACY REQRUIREMENTS.		
Table 1 of 40 CFR 141.202(a) (Items (5), (6), and (9))—To require public water systems to give a Tier 1 public notice (rather than a Tier 2 or Tier 3 notice) for violations or situations listed in Appendix A of Subpart Q of Part 141 of this chapter;	40 CFR 142.16 (a)(2)(iii)	
Requirements for States to adopt 40 CFR part 141, subpart S. In addition to the general primacy requirements specified elsewhere in this part, including the requirement that State regulations are no less stringent than the Federal requirements, an application for approval of a State program revision that adopts 40 CFR part 141, subpart S, must contain the information specified in this paragraph (o).	40 CFR 142.16 (o)	
Legal authority. The application for primacy must demonstrate the State has:	40 CFR 142.16 (o)(1)	
The authority contained in statute or regulation to ensure that ground water systems conduct source water monitoring under 40 CFR 141.402(a)(2), 40 CFR 141.402(a)(3) and 40 CFR 141.402(a)(4)(ii)(A) of this chapter.	40 CFR 142.16 (o)(1)(i)	
The authority contained in statute or regulation to ensure that ground water systems take the appropriate corrective actions including interim measures, if necessary, needed to address significant deficiencies.	40 CFR 142.16 (o)(1)(ii)	
The authority contained in statute or regulation to ensure that ground water systems take the appropriate corrective actions, including interim measures if necessary, to address any source water fecal contamination identified during source water monitoring under 40 CFR 141.402 of this chapter.	40 CFR 142.16 (o)(1)(iii)	
The authority contained in statute or regulation to ensure that ground water systems consult with the State regarding corrective action(s).	40 CFR 142.16 (o)(1)(iv)	

SUMMARY OF FEDERAL REQUIREMENT	FEDERAL CITATION	EXPLANATION OF STATE POLICIES AND PROCEDURES
State practices or procedures for sanitary surveys. In addition to the general requirements for sanitary surveys contained in 40 CFR 142.10(b)(2), a primacy application must describe how the State will implement a sanitary survey program that meets the requirements of paragraph (o)(2)(i) of this section. A "sanitary survey," as conducted by the State, includes but is not limited to, an onsite review of the water source(s) (identifying sources of contamination by using results of source water assessments or other relevant information where available), facilities, equipment, operation, maintenance, and monitoring compliance of a public water system to evaluate the adequacy of the system, its sources and operations and the distribution of safe drinking water.	40 CFR 142.16 (o)(2)	
The State must conduct sanitary surveys that address the eight sanitary survey components listed in this section no less frequently than every three years for community water systems, except as provided in paragraph (o)(2)(iii) of this section, and every five years for non-community water systems. The State may conduct more frequent sanitary surveys for any system. The initial sanitary survey for each community water system must be conducted by December 31, 2012, unless the system meets the requirements of paragraph (o)(2)(iii) of this section. The initial sanitary survey for each community water system that meets the requirements of paragraph (o)(2)(iii) of this section and for each non-community water system must be conducted by December 31, 2014. The sanitary survey must include an evaluation of each of the following elements as applicable:	40 CFR 142.16 (o)(2)(i)	
Source,	40 CFR 142.16 (o)(2)(i)(A)	
Treatment,	40 CFR 142.16 (o)(2)(i)(B)	
Distribution system,	40 CFR 142.16 (o)(2)(i)(C)	
Finished water storage,	40 CFR 142.16 (o)(2)(i)(D)	
Pumps, pump facilities, and controls,	40 CFR 142.16 (o)(2)(i)(E)	
Monitoring, reporting, and data verification,	40 CFR 142.16 (o)(2)(i)(F)	
System management and operation, and	40 CFR 142.16 (o)(2)(i)(G)	
Operator compliance with State requirements.	40 CFR 142.16 (o)(2)(i)(H)	

SUMMARY OF FEDERAL REQUIREMENT	FEDERAL CITATION	EXPLANATION OF STATE POLICIES AND PROCEDURES
The State may use a phased review process to meet the requirements of (o)(2)(i) of this section if all the applicable elements of paragraphs (o)(2)(i)(A) through (o)(2)(i)(H) of this section are evaluated within the required interval.	40 CFR 142.16 (o)(2)(ii)	
The State may conduct sanitary surveys once every five years for community water systems if the system either provides at least 4-log treatment of viruses (using inactivation, removal, or a State-approved combination of 4-log inactivation and removal) before or at the first customer for all its ground water sources, or if it has an outstanding performance record, as determined by the State and documented in previous sanitary surveys and has no history of total coliform MCL or monitoring violations under 40 CFR 141.21 of this chapter since the last sanitary survey. In its primacy application, the State must describe how it will determine whether a community water system has an outstanding performance record.	40 CFR 142.16 (o)(2)(iii)	
The State must define and describe in its primacy application at least one specific significant deficiency in each of the eight sanitary survey elements in paragraphs (o)(2)(i)(A) through (o)(2)(i)(H) of this section. Significant deficiencies include, but are not limited to, defects in design, operation, or maintenance, or a failure or malfunction of the sources, treatment, storage, or distribution system that the State determines to be causing, or have potential for causing, the introduction of contamination into the water delivered to consumers.	40 CFR 142.16 (o)(2)(iv)	
As a condition of primacy, the State must provide ground water systems with written notice describing any significant deficiencies no later than 30 days after the State identifies the significant deficiency. The notice may specify corrective actions and deadlines for completion of corrective actions. The State may provide the written notice at the time of the sanitary survey.	40 CFR 142.16 (o)(2)(v)	
State practices or procedures for source water microbial monitoring. The State's primacy application must include a description of the following:	40 CFR 142.16 (o)(3)	
The criteria the State will use under 40 CFR40 CFR 141.402(a)(2)(i) and 141.402(d)(2) of this chapter for extending the 24-hour time limit for a system to collect a ground water source sample to comply with the source water monitoring requirements.	40 CFR 142.16 (o)(3)(i)	

SUMMARY OF FEDERAL REQUIREMENT	FEDERAL CITATION	EXPLANATION OF STATE POLICIES AND PROCEDURES
The criteria the State will use under 40 CFR40 CFR 141.402(a)(5)(i) and 141.402(a)(5)(ii) of this chapter to determine whether the cause of the total coliform-positive sample taken under 40 CFR 141.21(a) of this chapter is directly related to the distribution system.	40 CFR 142.16 (o)(3)(ii)	
The criteria the State will use for determining whether to invalidate a fecal indicator-positive ground water source sample under 40 CFR 141.402(d)(1)(ii) of this chapter.	40 CFR 142.16 (o)(3)(iii)	
The criteria the State will use to allow source water microbial monitoring at a location after treatment under 40 CFR 141.402(e)(1) of this chapter.	40 CFR 142.16 (o)(3)(iv)	
State practices or procedures for treatment technique requirements. As a condition of primacy, the State must verify that significant deficiencies or source water fecal contamination have been addressed. The State must verify within 30 days after the ground water system has reported to the State that it has completed corrective action. The State must verify either through written confirmation from the ground water system or a site visit by the State. Written notice from the ground water system under 40 CFR 141.405(a)(2) of this chapter may serve as this verification. The State's primacy application must include the following:	40 CFR 142.16 (o)(4)	
The process the State will use to determine that a ground water system achieves at least a 4-log treatment of viruses (using inactivation, removal, or a combination of inactivation and removal) before or at the first customer for a ground water source for systems that are not subject to the source water monitoring requirements of 40 CFR 141.402(a) of this chapter because the ground water system has informed the State that it provides at least 4-log treatment of viruses.	40 CFR 142.16 (o)(4)(i)	
The process the State will use to determine the minimum residual disinfectant concentration the system must provide prior to the first customer for systems using chemical disinfection.	40 CFR 142.16 (o)(4)(ii)	

SUMMARY OF FEDERAL REQUIREMENT	FEDERAL CITATION	EXPLANATION OF STATE POLICIES AND PROCEDURES
The State-approved alternative technologies that ground water systems may use alone or in combination with other approved technologies to achieve at least 4-log treatment of viruses (using inactivation, removal, or a State-approved combination of 4-log inactivation and removal) before or at the first customer for a ground water source.	40 CFR 142.16 (o)(4)(iii)	
The monitoring and compliance requirements the State will require for ground water systems treating to at least 4-log treatment of viruses (using inactivation, removal, or a State-approved combination of inactivation and removal) before or at the first customer for State-approved alternative treatment technologies.	40 CFR 142.16 (o)(4)(iv)	
The monitoring, compliance and membrane integrity testing requirements the State will require to demonstrate virus removal for ground water systems using membrane filtration technologies.	40 CFR 142.16 (o)(4)(v)	
The criteria, including public health-based considerations and incorporating on-site investigations and source water monitoring results the State will use to determine if a ground water system may discontinue 4-log treatment of viruses (using inactivation, removal, or a State-approved combination of inactivation and removal) before or at the first customer.	40 CFR 142.16 (o)(4)(vi)	

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Appendix B

Rule Requirements

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PART 9—OMB APPROVALS UNDER THE PAPERWORK REDUCTION ACT

■ 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; Executive Order 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. In § 9.1 the table is amended by adding entries § 141.401–141.405'', § 142.14(d)(17)'', § 142.15(c)(7)'' and § 142.16(o)'' in numerical order, as follows:

§ 9.1 OMB approvals under the Paperwork Reduction Act.

* * * * *

40 CFR citation	OMB control No.
* * * * * * *	
National Primary Drinking Water Regulations	
* * * * * * *	
141.401–141.405	2040–0271
* * * * * * *	
National Primary Drinking Water Regulations Implementation	
* * * * * * *	
142.14(d)(17)	2040–0271
* * * * * * *	
142.15(c)(7)	2040–0271
* * * * * * *	
142.16(o)	2040–0271

* * * * *

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 141.21 is amended by adding paragraph (d)(3) to read as follows:

§ 141.21 Coliform sampling.

* * * * *

(d) * * *

(3) Sanitary surveys conducted by the State under the provisions of § 142.16(o)(2) of this chapter may be used to meet the sanitary survey requirements of this section.

* * * * *

■ 5. Section 141.28 is amended by revising paragraph (a) to read as follows:

§ 141.28 Certified laboratories.

(a) For the purpose of determining compliance with § 141.21 through 141.27, 141.30, 141.40, 141.74, 141.89 and 141.402, samples may be considered only if they have been analyzed by a laboratory certified by the State except that measurements of alkalinity, calcium, conductivity, disinfectant residual, orthophosphate, pH, silica, temperature and turbidity may be performed by any person acceptable to the State.

* * * * *

■ 6. Section 141.153 is amended by adding a new paragraph (h)(6) to read as follows:

§ 141.153 Content of the reports.

* * * * *

(h) * * *

(6) Systems required to comply with subpart S. (i) Any ground water system that receives notice from the State of a significant deficiency or notice from a laboratory of a fecal indicator-positive ground water source sample that is not invalidated by the State under § 141.402(d) must inform its customers of any significant deficiency that is uncorrected at the time of the next report or of any fecal indicator-positive ground water source sample in the next report. The system must continue to inform the public annually until the State determines that particular significant deficiency is corrected or the fecal contamination in the ground water source is addressed under § 141.403(a). Each report must include the following elements.

(A) The nature of the particular significant deficiency or the source of the fecal contamination (if the source is known) and the date the significant deficiency was identified by the State or the dates of the fecal indicator-positive ground water source samples;

(B) If the fecal contamination in the ground water source has been addressed under § 141.403(a) and the date of such action;

(C) For each significant deficiency or fecal contamination in the ground water source that has not been addressed under § 141.403(a), the State-approved plan and schedule for correction, including interim measures, progress to date, and any interim measures completed; and

(D) If the system receives notice of a fecal indicator-positive ground water source sample that is not invalidated by the State under § 141.402(d), the potential health effects using the health effects language of Appendix A of subpart O.

(ii) If directed by the State, a system with significant deficiencies that have been corrected before the next report is issued must inform its customers of the significant deficiency, how the deficiency was corrected, and the date of correction under paragraph (h)(6)(i) of this section.

* * * * *

■ 7. Appendix A to subpart O is amended by adding a new entry ''Fecal Indicators (enterococci or coliphage)'' to read as follows:

APPENDIX A TO SUBPART O OF PART 141—REGULATED CONTAMINANTS

Contaminant (units)	Traditional MCL in mg/L	To convert for CCR, multiply by	MCL in CCR units	MCLG	Major sources in drinking water	Health effects language
Microbiological Contaminants:						
*	*	*	*	*	*	*
Fecal Indicators (enterococci or coliphage).	TT		TT	N/A	Human and animal fecal waste.	Fecal indicators are microbes whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term health effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely compromised immune systems.
*	*	*	*	*	*	*

* * *

TT=Treatment Technique.

■ 8. Section 141.202 is amended by redesignating entry (8) in Table 1 in paragraph (a) as entry (9); and adding a new paragraph (8) to read as follows:

§ 141.202 Tier 1 Public Notice—Form, manner, and frequency of notice.

(a) * * *

Table 1 to § 141.202—Violation Categories and Other Situations Requiring a Tier 1 Public Notice

* * * * *

(8) Detection of *E. coli*, enterococci, or coliphage in source water samples as specified in § 141.402(a) and § 141.402(b).

* * * * *

■ 9. Section 141.203 is amended by adding entry (4) to Table 1 in paragraph (a) to read as follows:

§ 141.203 Tier 2 Public Notice—Form, manner, and frequency of notice.

(a) * * *

Table 1 to § 141.203—Violation Categories and Other Situations Requiring a Tier 2 Public Notice

* * * * *

(4) Failure to take corrective action or failure to maintain at least 4-log treatment of viruses (using inactivation, removal, or a State-approved combination of 4-log virus inactivation and removal) before or at the first customer under § 141.403(a).

* * * * *

■ 10. Appendix A to Subpart Q of Part 141 is amended to read as follows:

■ a. Adding I.A.11;

■ b. Redesignating entry IV.F as entry IV.G; and

■ c. Adding a new entry IV.F in alphabetical order:

APPENDIX A TO SUBPART Q OF PART 141—NPDWR VIOLATIONS AND OTHER SITUATIONS REQUIRING PUBLIC NOTICE [1]

Contaminant	MCL/MRDL/TT violations [2]		Monitoring and testing procedure violations	
	Tier of public notice required	Citation	Tier of public notice required	Citation
I. Violations of National Primary Drinking Water Regulations (NPDWR): [3]				
A. Microbiological Contaminants				
*	*	*	*	*
11. Ground Water Rule violations	2	141.404	3	141.402(h). 141.403(d).

APPENDIX A TO SUBPART Q OF PART 141—NPDWR VIOLATIONS AND OTHER SITUATIONS REQUIRING PUBLIC NOTICE [1]—Continued

Contaminant	MCL/MRDL/TT violations [2]		Monitoring and testing procedure violations	
	Tier of public notice required	Citation	Tier of public notice required	Citation
* * * *	*		*	*
IV. Other Situations Requiring Public Notification				
* * * *	*		*	*
F. Source Water Sample Positive for GWR Fecal indicators: E. coli, enterococci, or coliphage	1	141.402(g)	N/A	N/A
* * * *	*		*	*

[1] Violations and other situations not listed in this table (*e.g.*, failure to prepare Consumer Confidence Reports) do not require notice, unless otherwise determined by the primacy agency. Primacy agencies may, at their option, also require a more stringent public notice tier (*e.g.*, Tier 1 instead of Tier 2 or Tier 2 instead of Tier 3) for specific violations and situations listed in this Appendix, as authorized under § 141.202(a) and § 141.203(a).
[2] MCL—Maximum contaminant level, MRDL—Maximum residual disinfectant level, TT—Treatment technique.
[3] The term Violations of National Primary Drinking Water Regulations (NPDWR) is used here to include violations of MCL, MRDL, treatment technique, monitoring, and testing procedure requirements.

* * * * *

■ 11. Appendix B of Subpart Q of Part 141 is amended by adding entries A.1.c and A.1.d in numerical order to read as follows:

APPENDIX B TO SUBPART Q OF PART 141—STANDARD HEALTH EFFECTS LANGUAGE FOR PUBLIC NOTIFICATION

Contaminant	MCLG [1] mg/L	MCL [2] mg/L	Standard health effects language for public notification
National Primary Drinking Water Regulations (NPDWR) **A. Microbiological Contaminants**			
* * *	*	*	* * *
1c. Fecal indicators (GWR): i. E. coli ii. enterococci iii. coliphage	Zero None None	TT TT TT	Fecal indicators are microbes whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term health effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely compromised immune systems.
1d. Ground Water Rule (GWR) TT violations	None	TT	Inadequately treated or inadequately protected water may contain disease-causing organisms. These organisms can cause symptoms such as diarrhea, nausea, cramps, and associated headaches.
* * *	*	*	* * *

[1] MCLG—Maximum contaminant level goal.
[2] MCL—Maximum contaminant level.

* * * * *

■ 12. Appendix C to Subpart Q is amended by adding the following abbreviations in alphabetical order:

Appendix C to Subpart Q of Part 141—List of Acronyms Used in Public Notification Regulations

* * * * *

GWR Ground Water Rule

* * * * *

■ 13. A new subpart S is added to read as follows:

Subpart S—Ground Water Rule

Subpart S—Ground Water Rule

§ 141.400 General requirements and applicability.

(a) *Scope of this subpart.* The requirements of this subpart S constitute National Primary Drinking Water Regulations.

(b) *Applicability.* This subpart applies to all public water systems that use ground water except that it does not apply to public water systems that combine all of their ground water with surface water or with ground water under the direct influence of surface water prior to treatment under subpart

H. For the purposes of this subpart, ''ground water system'' is defined as any public water system meeting this applicability statement, including consecutive systems receiving finished ground water.

(c) *General requirements.* Systems subject to this subpart must comply with the following requirements:

(1) Sanitary survey information requirements for all ground water systems as described in § 141.401.

(2) Microbial source water monitoring requirements for ground water systems that do not treat all of their ground water to at least 99.99 percent (4-log) treatment of viruses (using inactivation, removal, or a State-approved combination of 4-log virus inactivation and removal) before or at the first customer as described in § 141.402.

(3) Treatment technique requirements, described in § 141.403, that apply to ground water systems that have fecally contaminated source waters, as determined by source water monitoring conducted under § 141.402, or that have significant deficiencies that are identified by the State or that are identified by EPA under SDWA section 1445. A ground water system with fecally contaminated source water or with significant deficiencies subject to the treatment technique requirements of this subpart must implement one or more of the following corrective action options: correct all significant deficiencies; provide an alternate source of water; eliminate the source of contamination; or provide treatment that reliably achieves at least 4-log treatment of viruses (using inactivation, removal, or a State-approved combination of 4-log virus inactivation and removal) before or at the first customer.

(4) Ground water systems that provide at least 4-log treatment of viruses (using inactivation, removal, or a State-approved combination of 4-log virus inactivation and removal) before or at the first customer are required to conduct compliance monitoring to demonstrate treatment effectiveness, as described in § 141.403(b).

(5) If requested by the State, ground water systems must provide the State with any existing information that will enable the State to perform a hydrogeologic sensitivity assessment. For the purposes of this subpart, ''hydrogeologic sensitivity assessment'' is a determination of whether ground water systems obtain water from hydrogeologically sensitive settings.

(d) *Compliance date.* Ground water systems must comply, unless otherwise noted, with the requirements of this subpart beginning December 1, 2009.

§ 141.401 Sanitary surveys for ground water systems.

(a) Ground water systems must provide the State, at the State's request, any existing information that will enable the State to conduct a sanitary survey.

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

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

(1) Source,

(2) Treatment,

(3) Distribution system,

(4) Finished water storage,

(5) Pumps, pump facilities, and controls,

(6) Monitoring, reporting, and data verification,

(7) System management and operation, and

(8) Operator compliance with State requirements.

§ 141.402 Ground water source microbial monitoring and analytical methods.

(a) *Triggered source water monitoring.*—(1) *General requirements.* A ground water system must conduct triggered source water monitoring if the conditions identified in paragraphs (a)(1)(i) and (a)(1)(ii) of this section exist.

(i) The system does not provide at least 4-log treatment of viruses (using inactivation, removal, or a State-approved combination of 4-log virus inactivation and removal) before or at the first customer for each ground water source; and

(ii) The system is notified that a sample collected under § 141.21(a) is total coliform-positive and the sample is not invalidated under § 141.21(c).

(2) *Sampling Requirements.* A ground water system must collect, within 24 hours of notification of the total coliform-positive sample, at least one ground water source sample from each ground water source in use at the time the total coliform-positive sample was collected under § 141.21(a), except as provided in paragraph (a)(2)(ii) of this section.

(i) The State may extend the 24-hour time limit on a case-by-case basis if the system cannot collect the ground water source water sample within 24 hours due to circumstances beyond its control. In the case of an extension, the State must specify how much time the system has to collect the sample.

(ii) If approved by the State, systems with more than one ground water source may meet the requirements of this paragraph (a)(2) by sampling a representative ground water source or sources. If directed by the State, systems must submit for State approval a triggered source water monitoring plan that identifies one or more ground water sources that are representative of each monitoring site in the system's sample siting plan under § 141.21(a) and that the system intends to use for representative sampling under this paragraph.

(iii) A ground water system serving 1,000 people or fewer may use a repeat sample collected from a ground water source to meet both the requirements of § 141.21(b) and to satisfy the monitoring requirements of paragraph (a)(2) of this section for that ground water source only if the State approves the use of *E. coli* as a fecal indicator for source water monitoring under this paragraph (a). If the repeat sample collected from the ground water source is *E.coli* positive, the system must comply with paragraph (a)(3) of this section.

(3) *Additional Requirements.* If the State does not require corrective action under § 141.403(a)(2) for a fecal indicator-positive source water sample collected under paragraph (a)(2) of this section that is not invalidated under paragraph (d) of this section, the system must collect five additional source water samples from the same source within 24 hours of being notified of the fecal indicator-positive sample.

(4) *Consecutive and Wholesale Systems.* (i). In addition to the other requirements of this paragraph (a), a consecutive ground water system that has a total coliform-positive sample collected under § 141.21(a) must notify the wholesale system(s) within 24 hours of being notified of the total coliform-positive sample.

(ii) In addition to the other requirements of this paragraph (a), a wholesale ground water system must comply with paragraphs (a)(4)(ii)(A) and (a)(4)(ii)(B) of this section.

(A) A wholesale ground water system that receives notice from a consecutive system it serves that a sample collected under § 141.21(a) is total coliform-positive must, within 24 hours of being notified, collect a sample from its ground water source(s) under paragraph (a)(2) of this section and analyze it for

a fecal indicator under paragraph (c) of this section.

(B) If the sample collected under paragraph (a)(4)(ii)(A) of this section is fecal indicator-positive, the wholesale ground water system must notify all consecutive systems served by that ground water source of the fecal indicator source water positive within 24 hours of being notified of the ground water source sample monitoring result and must meet the requirements of paragraph (a)(3) of this section.

(5) *Exceptions to the Triggered Source Water Monitoring Requirements.* A ground water system is not required to comply with the source water monitoring requirements of paragraph (a) of this section if either of the following conditions exists:

(i) The State determines, and documents in writing, that the total coliform-positive sample collected under § 141.21(a) is caused by a distribution system deficiency; or

(ii) The total coliform-positive sample collected under § 141.21(a) is collected at a location that meets State criteria for distribution system conditions that will cause total coliform-positive samples.

(b) *Assessment Source Water Monitoring.* If directed by the State, ground water systems must conduct assessment source water monitoring that meets State-determined requirements for such monitoring. A ground water system conducting assessment source water monitoring may use a triggered source water sample collected under paragraph (a)(2) of this section to meet the requirements of paragraph (b) of this section. State-determined assessment source water monitoring requirements may include:

(1) Collection of a total of 12 ground water source samples that represent each month the system provides ground water to the public,

(2) Collection of samples from each well unless the system obtains written State approval to conduct monitoring at one or more wells within the ground water system that are representative of multiple wells used by that system and that draw water from the same hydrogeologic setting,

(3) Collection of a standard sample volume of at least 100 mL for fecal indicator analysis regardless of the fecal indicator or analytical method used,

(4) Analysis of all ground water source samples using one of the analytical methods listed in the in paragraph (c)(2) of this section for the presence of *E. coli*, enterococci, or coliphage,

(5) Collection of ground water source samples at a location prior to any treatment of the ground water source unless the State approves a sampling location after treatment, and

(6) Collection of ground water source samples at the well itself unless the system's configuration does not allow for sampling at the well itself and the State approves an alternate sampling location that is representative of the water quality of that well.

(c) *Analytical methods.* (1) A ground water system subject to the source water monitoring requirements of paragraph (a) of this section must collect a standard sample volume of at least 100 mL for fecal indicator analysis regardless of the fecal indicator or analytical method used.

(2) A ground water system must analyze all ground water source samples collected under paragraph (a) of this section using one of the analytical methods listed in the following table in paragraph (c)(2) of this section for the presence of *E. coli*, enterococci, or coliphage:

ANALYTICAL METHODS FOR SOURCE WATER MONITORING

Fecal indicator [1]	Methodology	Method citation
E. coli	Colilert [3]	9223 B.[2]
	Colisure [3]	9223 B.[2]
	Membrane Filter Method with MI Agar	EPA Method 1604.[4]
	m-ColiBlue24 Test [5]	
	E*Colite Test [6]	
	EC–MUG [7]	9221 F.[2]
	NA–MUG [7]	9222 G.[2]
Enterococci	Multiple-Tube Technique	9230B.[2]
	Membrane Filter Technique	EPA Method 1600.[8]
	Enterolert [9]	
Coliphage	Two-Step Enrichment Presence-Absence Procedure.	EPA Method 1601.[10]
	Single Agar Layer Procedure	EPA Method 1602.[11]

Analyses must be conducted in accordance with the documents listed below. The Director of the Federal Register approves the incorporation by reference of the documents listed in footnotes 2–11 in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Copies of the documents may be obtained from the sources listed below. Copies may be inspected at EPA's Drinking Water Docket, EPA West, 1301 Constitution Avenue, NW., EPA West, Room B102, Washington DC 20460 (Telephone: 202–566–2426); or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202–741–6030, or go to: *http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html.*

[1] The time from sample collection to initiation of analysis may not exceed 30 hours. The ground water system is encouraged but is not required to hold samples below 10°C during transit.

[2] Methods are described in Standard Methods for the Examination of Water and Wastewater 20th edition (1998) and copies may be obtained from the American Public Health Association, 1015 Fifteenth Street, NW., Washington, DC 20005–2605.

[3] Medium is available through IDEXX Laboratories, Inc., One IDEXX Drive, Westbrook, Maine 04092.

[4] EPA Method 1604: Total Coliforms and *Escherichia coli* in Water by Membrane Filtration Using a Simultaneous Detection Technique (MI Medium); September 2002, EPA 821–R–02–024. Method is available at *http://www.epa.gov/nerlcwww/1604sp02.pdf* or from EPA's Water Resource Center (RC–4100T), 1200 Pennsylvania Avenue, NW., Washington, DC 20460.

[5] A description of the m-ColiBlue24 Test, ''Total Coliforms and *E. coli* Membrane Filtration Method with m-ColiBlue24® Broth,'' Method No. 10029 Revision 2, August 17, 1999, is available from Hach Company, 100 Dayton Ave., Ames, IA 50010 or from EPA's Water Resource Center (RC–4100T), 1200 Pennsylvania Avenue, NW., Washington, DC 20460.

[6] A description of the E*Colite Test, ''Charm E*Colite Presence/Absence Test for Detection and Identification of Coliform Bacteria and *Escherichia coli* in Drinking Water, January 9, 1998, is available from Charm Sciences, Inc., 659 Andover St., Lawrence, MA 01843–1032 or from EPA's Water Resource Center (RC–4100T), 1200 Pennsylvania Avenue, NW., Washington, DC 20460.

[7] EC–MUG (Method 9221F) or NA–MUG (Method 9222G) can be used for *E. coli* testing step as described in § 141.21(f)(6)(i) or (ii) after use of Standard Methods 9221 B, 9221 D, 9222 B, or 9222 C.

[8] EPA Method 1600: Enterococci in Water by Membrane Filtration Using membrane-Enterococcus Indoxyl–β–D–Glucoside Agar (mEI) EPA 821–R–02–022 (September 2002) is an approved variation of Standard Method 9230C. The method is available at *http://www.epa.gov/nerlcwww/1600sp02.pdf* or from EPA's Water Resource Center (RC–4100T), 1200 Pennsylvania Avenue, NW., Washington, DC 20460. The holding time and temperature for ground water samples are specified in footnote 1 above, rather than as specified in Section 8 of EPA Method 1600.

[9] Medium is available through IDEXX Laboratories, Inc., One IDEXX Drive, Westbrook, Maine 04092. Preparation and use of the medium is set forth in the article ''Evaluation of Enterolert for Enumeration of Enterococci in Recreational Waters,'' by Budnick, G.E., Howard, R.T., and Mayo, D.R., 1996, Applied and Environmental Microbiology, 62:3881–3884.

[10] EPA Method 1601: Male-specific (F+) and Somatic Coliphage in Water by Two-step Enrichment Procedure; April 2001, EPA 821–R–01–030. Method is available at *http://www.epa.gov/nerlcwww/1601ap01.pdf* or from EPA's Water Resource Center (RC–4100T), 1200 Pennsylvania Avenue, NW., Washington, DC 20460.

[11] EPA Method 1602: Male-specific (F+) and Somatic Coliphage in Water by Single Agar Layer (SAL) Procedure; April 2001, EPA 821–R–01–029. Method is available at *http://www.epa.gov/nerlcwww/1602ap01.pdf* or from EPA's Water Resource Center (RC–4100T), 1200 Pennsylvania Avenue, NW., Washington, DC 20460.

(d) *Invalidation of a fecal indicator-positive ground water source sample.* (1) A ground water system may obtain State invalidation of a fecal indicator-positive ground water source sample collected under paragraph (a) of this section only under the conditions specified in paragraphs (d)(1)(i) and (ii) of this section.

(i) The system provides the State with written notice from the laboratory that improper sample analysis occurred; or

(ii) The State determines and documents in writing that there is substantial evidence that a fecal indicator-positive ground water source sample is not related to source water quality.

(2) If the State invalidates a fecal indicator-positive ground water source sample, the ground water system must collect another source water sample under paragraph (a) of this section within 24 hours of being notified by the State of its invalidation decision and have it analyzed for the same fecal indicator using the analytical methods in paragraph (c) of this section. The State may extend the 24-hour time limit on a case-by-case basis if the system cannot collect the source water sample within 24 hours due to circumstances beyond its control. In the case of an extension, the State must specify how much time the system has to collect the sample.

(e) *Sampling location.* (1) Any ground water source sample required under paragraph (a) of this section must be collected at a location prior to any treatment of the ground water source unless the State approves a sampling location after treatment.

(2) If the system's configuration does not allow for sampling at the well itself, the system may collect a sample at a State-approved location to meet the requirements of paragraph (a) of this section if the sample is representative of the water quality of that well.

(f) *New Sources.* If directed by the State, a ground water system that places a new ground water source into service after November 30, 2009, must conduct assessment source water monitoring under paragraph (b) of this section. If directed by the State, the system must begin monitoring before the ground water source is used to provide water to the public.

(g) *Public Notification.* A ground water system with a ground water source sample collected under paragraph (a) or (b) of this section that is fecal indicator-positive and that is not invalidated under paragraph (d) of this section, including consecutive systems served by the ground water source, must conduct public notification under § 141.202.

(h) *Monitoring Violations.* Failure to meet the requirements of paragraphs (a)–(f) of this section is a monitoring violation and requires the ground water system to provide public notification under § 141.204.

§ 141.403 Treatment technique requirements for ground water systems.

(a) *Ground water systems with significant deficiencies or source water fecal contamination.*

(1) The treatment technique requirements of this section must be met by ground water systems when a significant deficiency is identified or when a ground water source sample collected under § 141.402(a)(3) is fecal indicator-positive.

(2) If directed by the State, a ground water system with a ground water source sample collected under § 141.402(a)(2), § 141.402(a)(4), or § 141.402(b) that is fecal indicator-positive must comply with the treatment technique requirements of this section.

(3) When a significant deficiency is identified at a Subpart H public water system that uses both ground water and surface water or ground water under the direct influence of surface water, the system must comply with provisions of this paragraph except in cases where the State determines that the significant deficiency is in a portion of the distribution system that is served solely by surface water or ground water under the direct influence of surface water.

(4) Unless the State directs the ground water system to implement a specific corrective action, the ground water system must consult with the State regarding the appropriate corrective action within 30 days of receiving written notice from the State of a significant deficiency, written notice from a laboratory that a ground water source sample collected under § 141.402(a)(3) was found to be fecal indicator-positive, or direction from the State that a fecal indicator'positive collected under § 141.402(a)(2), § 141.402(a)(4), or § 141.402(b) requires corrective action. For the purposes of this subpart, significant deficiencies include, but are not limited to, defects in design, operation, or maintenance, or a failure or malfunction of the sources, treatment, storage, or distribution system that the State determines to be causing, or have potential for causing, the introduction of contamination into the water delivered to consumers.

(5) Within 120 days (or earlier if directed by the State) of receiving written notification from the State of a significant deficiency, written notice from a laboratory that a ground water source sample collected under § 141.402(a)(3) was found to be fecal indicator-positive, or direction from the State that a fecal indicator-positive sample collected under § 141.402(a)(2), § 141.402(a)(4), or § 141.402(b) requires corrective action, the ground water system must either:

(i) Have completed corrective action in accordance with applicable State plan review processes or other State guidance or direction, if any, including State-specified interim measures; or

(ii) Be in compliance with a State-approved corrective action plan and schedule subject to the conditions specified in paragraphs (a)(5)(ii)(A) and (a)(5)(ii)(B) of this section.

(A) Any subsequent modifications to a State-approved corrective action plan and schedule must also be approved by the State.

(B) If the State specifies interim measures for protection of the public health pending State approval of the corrective action plan and schedule or pending completion of the corrective action plan, the system must comply with these interim measures as well as

with any schedule specified by the State.

(6) *Corrective Action Alternatives.* Ground water systems that meet the conditions of paragraph (a)(1) or (a)(2) of this section must implement one or more of the following corrective action alternatives:

(i) Correct all significant deficiencies;

(ii) Provide an alternate source of water;

(iii) Eliminate the source of contamination; or

(iv) Provide treatment that reliably achieves at least 4-log treatment of viruses (using inactivation, removal, or a State-approved combination of 4-log virus inactivation and removal) before or at the first customer for the ground water source.

(7) *Special notice to the public of significant deficiencies or source water fecal contamination.* (i) In addition to the applicable public notification requirements of § 141.202, a community ground water system that receives notice from the State of a significant deficiency or notification of a fecal indicator-positive ground water source sample that is not invalidated by the State under § 141.402(d) must inform the public served by the water system under § 141.153(h)(6) of the fecal indicator-positive source sample or of any significant deficiency that has not been corrected. The system must continue to inform the public annually until the significant deficiency is corrected or the fecal contamination in the ground water source is determined by the State to be corrected under paragraph (a)(5) of this section.

(ii) In addition to the applicable public notification requirements of § 141.202, a non-community ground water system that receives notice from the State of a significant deficiency must inform the public served by the water system in a manner approved by the State of any significant deficiency that has not been corrected within 12 months of being notified by the State, or earlier if directed by the State. The system must continue to inform the public annually until the significant deficiency is corrected. The information must include:

(A) The nature of the significant deficiency and the date the significant deficiency was identified by the State;

(B) The State-approved plan and schedule for correction of the significant deficiency, including interim measures, progress to date, and any interim measures completed; and

(C) For systems with a large proportion of non-English speaking consumers, as determined by the State, information in the appropriate language(s) regarding the importance of the notice or a telephone number or address where consumers may contact the system to obtain a translated copy of the notice or assistance in the appropriate language.

(iii) If directed by the State, a non-community water system with significant deficiencies that have been corrected must inform its customers of the significant deficiencies, how the deficiencies were corrected, and the dates of correction under paragraph (a)(7)(ii) of this section.

(b) *Compliance monitoring*—(1) *Existing ground water sources.* A ground water system that is not required to meet the source water monitoring requirements of this subpart for any ground water source because it provides at least 4-log treatment of viruses (using inactivation, removal, or a State-approved combination of 4-log virus inactivation and removal) before or at the first customer for any ground water source before December 1, 2009, must notify the State in writing that it provides at least 4-log treatment of viruses (using inactivation, removal, or a State-approved combination of 4-log virus inactivation and removal) before or at the first customer for the specified ground water source and begin compliance monitoring in accordance with paragraph (b)(3) of this section by December 1, 2009. Notification to the State must include engineering, operational, or other information that the State requests to evaluate the submission. If the system subsequently discontinues 4-log treatment of viruses (using inactivation, removal, or a State-approved combination of 4-log virus inactivation and removal) before or at the first customer for a ground water source, the system must conduct ground water source monitoring as required under § 141.402.

(2) *New ground water sources.* A ground water system that places a ground water source in service after November 30, 2009, that is not required to meet the source water monitoring requirements of this subpart because the system provides at least 4-log treatment of viruses (using inactivation, removal, or a State-approved combination of 4-log virus inactivation and removal) before or at the first customer for the ground water source must comply with the requirements of paragraphs (b)(2)(i), (b)(2)(ii) and (b)(2)(iii) of this section.

(i) The system must notify the State in writing that it provides at least 4-log treatment of viruses (using inactivation, removal, or a State-approved combination of 4-log virus inactivation and removal) before or at the first customer for the ground water source. Notification to the State must include engineering, operational, or other information that the State requests to evaluate the submission.

(ii) The system must conduct compliance monitoring as required under § 141.403(b)(3) of this subpart within 30 days of placing the source in service.

(iii) The system must conduct ground water source monitoring under § 141.402 if the system subsequently discontinues 4-log treatment of viruses (using inactivation, removal, or a State-approved combination of 4-log virus inactivation and removal) before or at the first customer for the ground water source.

(3) *Monitoring requirements.* A ground water system subject to the requirements of paragraphs (a), (b)(1) or (b)(2) of this section must monitor the effectiveness and reliability of treatment for that ground water source before or at the first customer as follows:

(i) *Chemical disinfection*—(A) *Ground water systems serving greater than 3,300 people.* A ground water system that serves greater than 3,300 people must continuously monitor the residual disinfectant concentration using analytical methods specified in § 141.74(a)(2) at a location approved by the State and must record the lowest residual disinfectant concentration each day that water from the ground water source is served to the public. The ground water system must maintain the State-determined residual disinfectant concentration every day the ground water system serves water from the ground water source to the public. If there is a failure in the continuous monitoring equipment, the ground water system must conduct grab sampling every four hours until the continuous monitoring equipment is returned to service. The system must resume continuous residual disinfectant monitoring within 14 days.

(B) *Ground water systems serving 3,300 or fewer people.* A ground water system that serves 3,300 or fewer people must monitor the residual disinfectant concentration using analytical methods specified in § 141.74(a)(2) at a location approved by the State and record the residual disinfection concentration each day that water from the ground water source is served to the public. The ground water system must maintain the State-determined residual disinfectant concentration every day the ground water system serves water from the ground water source to the public. The ground water system must take a daily grab sample during the hour of peak flow or at another time specified by the State. If any daily grab sample

measurement falls below the State-determined residual disinfectant concentration, the ground water system must take follow-up samples every four hours until the residual disinfectant concentration is restored to the State-determined level. Alternatively, a ground water system that serves 3,300 or fewer people may monitor continuously and meet the requirements of paragraph (b)(3)(i)(A) of this section.

(ii) *Membrane filtration.* A ground water system that uses membrane filtration to meet the requirements of this subpart must monitor the membrane filtration process in accordance with all State-specified monitoring requirements and must operate the membrane filtration in accordance with all State-specified compliance requirements. A ground water system that uses membrane filtration is in compliance with the requirement to achieve at least 4-log removal of viruses when:

(A) The membrane has an absolute molecular weight cut-off (MWCO), or an alternate parameter that describes the exclusion characteristics of the membrane, that can reliably achieve at least 4-log removal of viruses;

(B) The membrane process is operated in accordance with State-specified compliance requirements; and

(C) The integrity of the membrane is intact.

(iii) *Alternative treatment.* A ground water system that uses a State-approved alternative treatment to meet the requirements of this subpart by providing at least 4-log treatment of viruses (using inactivation, removal, or a State-approved combination of 4-log virus inactivation and removal) before or at the first customer must:

(A) Monitor the alternative treatment in accordance with all State-specified monitoring requirements; and

(B) Operate the alternative treatment in accordance with all compliance requirements that the State determines to be necessary to achieve at least 4-log treatment of viruses.

(c) Discontinuing treatment. A ground water system may discontinue 4-log treatment of viruses (using inactivation, removal, or a State-approved combination of 4-log virus inactivation and removal) before or at the first customer for a ground water source if the State determines and documents in writing that 4-log treatment of viruses is no longer necessary for that ground water source. A system that discontinues 4-log treatment of viruses is subject to the source water monitoring and analytical methods requirements of § 141.402 of this subpart.

(d) Failure to meet the monitoring requirements of paragraph (b) of this section is a monitoring violation and requires the ground water system to provide public notification under § 141.204.

§ 141.404 Treatment technique violations for ground water systems.

(a) A ground water system with a significant deficiency is in violation of the treatment technique requirement if, within 120 days (or earlier if directed by the State) of receiving written notice from the State of the significant deficiency, the system:

(1) Does not complete corrective action in accordance with any applicable State plan review processes or other State guidance and direction, including State specified interim actions and measures, or

(2) Is not in compliance with a State-approved corrective action plan and schedule.

(b) Unless the State invalidates a fecal indicator-positive ground water source sample under § 141.402(d), a ground water system is in violation of the treatment technique requirement if, within 120 days (or earlier if directed by the State) of meeting the conditions of § 141.403(a)(1) or § 141.403(a)(2), the system:

(1) Does not complete corrective action in accordance with any applicable State plan review processes or other State guidance and direction, including State-specified interim measures, or

(2) Is not in compliance with a State-approved corrective action plan and schedule.

(c) A ground water system subject to the requirements of § 141.403(b)(3) that fails to maintain at least 4-log treatment of viruses (using inactivation, removal, or a State-approved combination of 4-log virus inactivation and removal) before or at the first customer for a ground water source is in violation of the treatment technique requirement if the failure is not corrected within four hours of determining the system is not maintaining at least 4-log treatment of viruses before or at the first customer.

(d) Ground water system must give public notification under § 141.203 for the treatment technique violations specified in paragraphs (a), (b) and (c) of this section.

§ 141.405 Reporting and recordkeeping for ground water systems.

(a) *Reporting.* In addition to the requirements of § 141.31, a ground water system regulated under this subpart must provide the following information to the State:

(1) A ground water system conducting compliance monitoring under § 141.403(b) must notify the State any time the system fails to meet any State-specified requirements including, but not limited to, minimum residual disinfectant concentration, membrane operating criteria or membrane integrity, and alternative treatment operating criteria, if operation in accordance with the criteria or requirements is not restored within four hours. The ground water system must notify the State as soon as possible, but in no case later than the end of the next business day.

(2) After completing any corrective action under § 141.403(a), a ground water system must notify the State within 30 days of completion of the corrective action.

(3) If a ground water system subject to the requirements of § 141.402(a) does not conduct source water monitoring under § 141.402(a)(5)(ii), the system must provide documentation to the State within 30 days of the total coliform positive sample that it met the State criteria.

(b) *Recordkeeping.* In addition to the requirements of § 141.33, a ground water system regulated under this subpart must maintain the following information in its records:

(1) Documentation of corrective actions. Documentation shall be kept for a period of not less than ten years.

(2) Documentation of notice to the public as required under § 141.403(a)(7). Documentation shall be kept for a period of not less than three years.

(3) Records of decisions under § 141.402(a)(5)(ii) and records of invalidation of fecal indicator-positive ground water source samples under § 141.402(d). Documentation shall be kept for a period of not less than five years.

(4) For consecutive systems, documentation of notification to the wholesale system(s) of total-coliform positive samples that are not invalidated under § 141.21(c). Documentation shall be kept for a period of not less than five years.

(5) For systems, including wholesale systems, that are required to perform compliance monitoring under § 141.403(b):

(i) Records of the State-specified minimum disinfectant residual. Documentation shall be kept for a period of not less than ten years.

(ii) Records of the lowest daily residual disinfectant concentration and records of the date and duration of any failure to maintain the State-prescribed minimum residual disinfectant concentration for a period of more than

four hours. Documentation shall be kept for a period of not less than five years.

(iii) Records of State-specified compliance requirements for membrane filtration and of parameters specified by the State for State-approved alternative treatment and records of the date and duration of any failure to meet the membrane operating, membrane integrity, or alternative treatment operating requirements for more than four hours. Documentation shall be kept for a period of not less than five years.

PART 142—NATIONAL PRIMARY DRINKING WATER REGULATIONS IMPLEMENTATION

■ 14. 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.

■ 15. Section 142.14 is amended by adding paragraph (d)(17) to read as follows:

§ 142.14 Records kept by States.

* * * * *

(d) * * *

(17) Records of the currently applicable or most recent State determination, including all supporting information and an explanation of the technical basis of each decision, made under the following provisions of 40 CFR part 141, subpart S and 40 CFR part 142.

(i) Section 142.16(o)(2)(v). Records of written notices of significant deficiencies.

(ii) Section 141.403(a)(5)(ii) of this chapter. Records of corrective action plans, schedule approvals, and State-specified interim measures.

(iii) Section 142.16(o)(4). Records of confirmations under § 141.403(a) of this chapter that a significant deficiency has been corrected or the fecal contamination in the ground water source has been addressed.

(iv) Section 141.402(a)(5) of this chapter. Records of State determinations and records of ground water system's documentation for not conducting triggered source water monitoring.

(v) Section 141.402(d) of this chapter. Records of invalidations of fecal indicator-positive ground water source samples.

(vi) Section 141.402(a)(2)(ii) of this chapter. Records of State approvals of source water monitoring plans.

(vii) Section 142.16(o)(4)(ii). Records of notices of the minimum residual disinfection concentration (when using chemical disinfection) needed to achieve at least 4-log virus inactivation before or at the first customer.

(viii) Sections 142.16(o)(4)(iv) and 142.16(o)(4)(v) Records of notices of the State-specified monitoring and compliance requirements (when using membrane filtration or alternative treatment) needed to achieve at least 4-log treatment of viruses (using inactivation, removal, or a State-approved combination of 4-log inactivation and removal) before or at the first customer.

(ix) Sections 141.403(b)(1) and 141.403(b)(2) of this chapter. Records of written notices from the ground water system that it provides at least 4-log treatment of viruses (using inactivation, removal, or a State-approved combination of 4-log virus inactivation and removal) before or at the first customer for a ground water source.

(x) Section 142.16(o)(4)(vi). Records of written determinations that the ground water system may discontinue 4-log treatment of viruses (using inactivation, removal, or a State-approved combination of 4-log inactivation and removal).

* * * * *

■ 16. Section 142.15 is amended by adding paragraph (c)(7) to read as follows:

§ 142.15 Reports by States.

* * * * *

(c) * * *

(7) *Ground water rule.* (i) *Sanitary surveys.* The month and year in which the most recent sanitary survey was completed or, for a State that uses a phased review process, the date the last element of the applicable eight elements was evaluated under § 142.16(o)(2) for each ground water system.

(ii) *Corrective action requirements.* For any corrective action under § 141.403(a) of this chapter, the date the ground water system completed corrective action.

(iii) *Compliance monitoring.* All ground water systems providing at least 4-log treatment of viruses (using inactivation, removal, or a State-approved combination of 4-log virus inactivation and removal) before or at the first customer for any ground water source(s).

* * * * *

■ 17. Section 142.16 is amended as follows:

■ a. Revise paragraph (a)(2)(iii), and

■ b. Add paragraph (o) to read as follows:

§ 142.16 Special primacy requirements.

(a) * * *

(2) * * *

(iii) *Table 1 of 40 CFR 141.202(a) (Items (5), (6), and (9))*—To require public water systems to give a Tier 1 public notice (rather than a Tier 2 or Tier 3 notice) for violations or situations listed in Appendix A of Subpart Q of Part 141 of this chapter;

(o) *Requirements for States to adopt 40 CFR part 141, subpart S.* In addition to the general primacy requirements specified elsewhere in this part, including the requirement that State regulations are no less stringent than the Federal requirements, an application for approval of a State program revision that adopts 40 CFR part 141, subpart S, must contain the information specified in this paragraph (o).

(1) *Legal authority.* The application for primacy must demonstrate the State has:

(i) The authority contained in statute or regulation to ensure that ground water systems conduct source water monitoring under § 141.402(a)(2), § 141.402(a)(3) and § 141.402(a)(4)(ii)(A) of this chapter.

(ii) The authority contained in statute or regulation to ensure that ground water systems take the appropriate corrective actions including interim measures, if necessary, needed to address significant deficiencies.

(iii) The authority contained in statute or regulation to ensure that ground water systems take the appropriate corrective actions, including interim measures if necessary, to address any source water fecal contamination identified during source water monitoring under § 141.402 of this chapter.

(iv) The authority contained in statute or regulation to ensure that ground water systems consult with the State regarding corrective action(s).

(2) *State practices or procedures for sanitary surveys.* In addition to the general requirements for sanitary surveys contained in § 142.10(b)(2), a primacy application must describe how the State will implement a sanitary survey program that meets the requirements of paragraph (o)(2)(i) of this section. A ''sanitary survey,'' as conducted by the State, includes but is not limited to, an onsite review of the water source(s) (identifying sources of contamination by using results of source water assessments or other relevant information where available), facilities, equipment, operation, maintenance, and monitoring compliance of a public water system to evaluate the adequacy of the system, its sources and operations and the distribution of safe drinking water.

(i) The State must conduct sanitary surveys that address the eight sanitary survey components listed in this section no less frequently than every three years

for community water systems, except as provided in paragraph (o)(2)(iii) of this section, and every five years for non-community water systems. The State may conduct more frequent sanitary surveys for any system. The initial sanitary survey for each community water system must be conducted by December 31, 2012, unless the system meets the requirements of paragraph (o)(2)(iii) of this section. The initial sanitary survey for each community water system that meets the requirements of paragraph (o)(2)(iii) of this section and for each non-community water system must be conducted by December 31, 2014. The sanitary survey must include an evaluation of each of the following elements as applicable:

(A) Source,

(B) Treatment,

(C) Distribution system,

(D) Finished water storage,

(E) Pumps, pump facilities, and controls,

(F) Monitoring, reporting, and data verification,

(G) System management and operation, and

(H) Operator compliance with State requirements.

(ii) The State may use a phased review process to meet the requirements of (o)(2)(i) of this section if all the applicable elements of paragraphs (o)(2)(i)(A) through (o)(2)(i)(H) of this section are evaluated within the required interval.

(iii) The State may conduct sanitary surveys once every five years for community water systems if the system either provides at least 4-log treatment of viruses (using inactivation, removal, or a State-approved combination of 4-log inactivation and removal) before or at the first customer for all its ground water sources, or if it has an outstanding performance record, as determined by the State and documented in previous sanitary surveys and has no history of total coliform MCL or monitoring violations under § 141.21 of this chapter since the last sanitary survey. In its primacy application, the State must describe how it will determine whether a community water system has an outstanding performance record.

(iv) The State must define and describe in its primacy application at least one specific significant deficiency in each of the eight sanitary survey elements in paragraphs (o)(2)(i)(A) through (o)(2)(i)(H) of this section. Significant deficiencies include, but are not limited to, defects in design, operation, or maintenance, or a failure or malfunction of the sources, treatment, storage, or distribution system that the State determines to be causing, or have potential for causing, the introduction of contamination into the water delivered to consumers.

(v) As a condition of primacy, the State must provide ground water systems with written notice describing any significant deficiencies no later than 30 days after the State identifies the significant deficiency. The notice may specify corrective actions and deadlines for completion of corrective actions. The State may provide the written notice at the time of the sanitary survey.

(3) *State practices or procedures for source water microbial monitoring*. The State's primacy application must include a description of the following:

(i) The criteria the State will use under §§ 141.402(a)(2)(i) and 141.402(d)(2) of this chapter for extending the 24-hour time limit for a system to collect a ground water source sample to comply with the source water monitoring requirements.

(ii) The criteria the State will use under §§ 141.402(a)(5)(i) and 141.402(a)(5)(ii) of this chapter to determine whether the cause of the total coliform-positive sample taken under § 141.21(a) of this chapter is directly related to the distribution system.

(iii) The criteria the State will use for determining whether to invalidate a fecal indicator-positive ground water source sample under § 141.402(d)(1)(ii) of this chapter.

(iv) The criteria the State will use to allow source water microbial monitoring at a location after treatment under § 141.402(e)(1) of this chapter.

(4) *State practices or procedures for treatment technique requirements.* As a condition of primacy, the State must verify that significant deficiencies or source water fecal contamination have been addressed. The State must verify within 30 days after the ground water system has reported to the State that it has completed corrective action. The State must verify either through written confirmation from the ground water system or a site visit by the State. Written notice from the ground water system under § 141.405(a)(2) of this chapter may serve as this verification. The State's primacy application must include the following:

(i) The process the State will use to determine that a ground water system achieves at least a 4-log treatment of viruses (using inactivation, removal, or a combination of inactivation and removal) before or at the first customer for a ground water source for systems that are not subject to the source water monitoring requirements of § 141.402(a) of this chapter because the ground water system has informed the State that it provides at least 4-log treatment of viruses.

(ii) The process the State will use to determine the minimum residual disinfectant concentration the system must provide prior to the first customer for systems using chemical disinfection.

(iii) The State-approved alternative technologies that ground water systems may use alone or in combination with other approved technologies to achieve at least 4-log treatment of viruses (using inactivation, removal, or a State-approved combination of 4-log inactivation and removal) before or at the first customer for a ground water source.

(iv) The monitoring and compliance requirements the State will require for ground water systems treating to at least 4-log treatment of viruses (using inactivation, removal, or a State-approved combination of inactivation and removal) before or at the first customer for State-approved alternative treatment technologies.

(v) The monitoring, compliance and membrane integrity testing requirements the State will require to demonstrate virus removal for ground water systems using membrane filtration technologies.

(vi) The criteria, including public health-based considerations and incorporating on-site investigations and source water monitoring results the State will use to determine if a ground water system may discontinue 4-log treatment of viruses (using inactivation, removal, or a State-approved combination of inactivation and removal) before or at the first customer.

* * * * *

[FR Doc. 06–8763 Filed 11–7–06; 8:45 am]

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Corrections

Federal Register
Vol. 71, No. 224
Tuesday, November 21, 2006

This section of the FEDERAL REGISTER contains editorial corrections of previously published Presidential, Rule, Proposed Rule, and Notice documents. These corrections are prepared by the Office of the Federal Register. Agency prepared corrections are issued as signed documents and appear in the appropriate document categories elsewhere in the issue.

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 141

[EPA–HQ–OW–2002–0061; FRL–8231–9]

RIN 2040–AA97

National Primary Drinking Water Regulations: Ground Water Rule

Correction

In rule document 06–8763 beginning on page 65574 in the issue of Wednesday, November 8, 2006, make the following correction:

§141.402 [Corrected]

On page 65655, in § 141.402(c)(2), the table is corrected to read as follows:

ANALYTICAL METHODS FOR SOURCE WATER MONITORING

Fecal indicator [1]	Methodology	Method citation
E. coli	Colilert [3]	9223 B.[2]
	Colisure [3]	9223 B.[2]
	Membrane Filter Method with MI Agar	EPA Method 1604.[4]
	m-ColiBlue24 Test [5]	
	E*Colite Test [6]	
	EC–MUG [7]	9221 F.[2]
	NA–MUG [7]	9222 G.[2]
Enterococci	Multiple-Tube Technique	9230B.[2]
	Membrane Filter Technique	9230C.[2]
	Membrane Filter Technique	EPA Method 1600.[8]
	Enterolert [9]	
Coliphage	Two-Step Enrichment Presence-Absence Procedure.	EPA Method 1601.[10]
	Single Agar Layer Procedure	EPA Method 1602.[11]

[FR Doc. C6–8763 Filed 11–20–06; 8:45 am]
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Appendix C

Rule Factsheets and Quick Reference Guide

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Ground Water Rule Factsheet: General Rule Requirements

What is the Ground Water Rule?

The U.S. Environmental Protection Agency (EPA) published the Ground Water Rule (GWR) on November 8, 2006. One goal of the GWR is to provide increased protection against microbial pathogens, specifically bacterial and viral pathogens, in public water systems (PWSs) that use ground water. Instead of requiring disinfection for all ground water systems (GWSs), the GWR establishes a risk-targeted approach to identifying GWSs that are susceptible to fecal contamination. The GWR requires systems at risk of microbial contamination to take corrective action to protect consumers from harmful bacteria and viruses.

To Whom Does the GWR Apply?

The GWR applies to all PWSs that:

- Rely entirely on one or more ground water sources.
- Are consecutive systems receiving ground water.
- Mix surface and ground water, where ground water is added directly to the distribution system and delivered to consumers without treatment equivalent to the treatment provided for surface water.

Although all of these systems are subject to the GWR provisions, systems that have been identified as at-risk for contamination (by inspection or based on monitoring results) will account for most of the systems that have to take corrective action to comply with this rule.

What are the Basic Requirements of the GWR?

The basic requirements of the GWR include:

- Sanitary surveys.
- Source water monitoring.
- Compliance monitoring.
- Corrective actions.

Sanitary surveys are primarily the responsibility of the states, while GWSs are responsible for the other requirements.

What are the Sanitary Survey Requirements?

The GWR requires states to conduct sanitary surveys of all GWSs in order to identify significant deficiencies, including deficiencies that could make a system susceptible to microbial contamination. Following the initial sanitary survey, states must conduct surveys every 3 years for community water systems (CWSs) and every 5 years for non-community water systems (NCWSs). States may conduct sanitary surveys every 5 years for CWSs that either provide at least 4-log treatment of viruses or have outstanding performance records, as determined by the state.

Systems must provide the state with any information that will enable the sanitary survey to be complete and accurate. Each survey must include, but is not limited to, an onsite review and evaluation of eight elements:

- Source.
- Treatment.
- Distribution system.
- Finished water storage.
- Pumps, pump facilities, and controls.
- Monitoring, reporting, and data verification.
- System management and operation.
- Operator compliance with state requirements.

If a state identifies a significant deficiency during a sanitary survey or at another time, the system must take corrective action. A significant deficiency may include defects in design, maintenance, or operation of the water system. A significant deficiency may also include the failure or malfunction of the source, treatment, or distribution system that may cause contamination of water delivered to consumers.

For more information on the sanitary survey requirements of the GWR, please refer to "Ground Water Rule Factsheet: Sanitary Surveys."

What is Triggered Source Water Monitoring?

Triggered source water monitoring is required for any GWS that is not conducting GWR compliance monitoring for 4-log treatment of viruses and is notified of a positive total coliform result under the Total Coliform Rule (TCR) routine sampling. Triggered source water monitoring is used to determine if fecal contamination is present in the ground water source. If a triggered source water sample is positive for a fecal indicator, the state will require that the system either take corrective action or collect five additional samples from the same source within 24 hours of notification of the fecal indicator-positive result and analyze them for a fecal indicator. If any one of the five additional samples is fecal indicator-positive, the system must take corrective action.

What is Compliance Monitoring?

Systems providing at least 99.99 percent (4-log) treatment of viruses (using inactivation, removal, or a state-approved combination of inactivation and removal) of all of their ground water can notify the state of this treatment and are then not required to conduct triggered source water monitoring. Those systems are, however, required to conduct **compliance monitoring** to show they are providing consistent and sufficient treatment. Compliance monitoring requirements depend on the system's size and the type of treatment it is using.

For more information on source water monitoring and compliance monitoring, please refer to "Ground Water Rule Factsheet: Monitoring Requirements."

What are the Corrective Action Requirements?

Corrective action is required for any GWS with a **significant deficiency**. Some systems with fecal indicator-positive results from their **triggered source water monitoring** may be required by their states to take corrective action rather than conduct additional source water monitoring. If a system is

instructed to carry out **additional source water monitoring**, corrective action is required if a GWS has a fecal indicator-positive result during the additional source water monitoring. As the figure below shows, systems have four corrective action alternatives.

Corrective Action Requirements Timeline

Start Date is . . .	Within 30 Days*	Within 120 Days*
Notice of significant deficiency **OR** Notice from the lab of fecal indicator-positive sample from triggered or assessment source water monitoring **OR** Notice of fecal-indicator positive sample from at least 1 of 5 additional source water monitoring samples	System consults with state to determine corrective action **OR** State specifies corrective action	System must complete corrective action plan **OR** System must be in compliance with state-approved corrective action plan and schedule

*Based on date of the notice.

Corrective Action Alternatives Systems must do one or more of the following:
Correct all significant deficiencies
Provide an alternate source of water
Eliminate the source of contamination
Provide treatment that reliably achieves 99.99 percent (4-log) inactivation and/or removal of viruses

WHAT ARE THE COMPLIANCE DEADLINES ASSOCIATED WITH THE GWR?

PWS Requirements	Required Beginning[1]:
Source water monitoring	December 1, 2009
Corrective actions	
Compliance monitoring[2]	
	Required By[1]:
Notification of 4-log treatment of viruses[2]	December 1, 2009
State Requirements	**Required By[1]:**
Complete sanitary surveys for most CWSs	December 31, 2012 (and every 3 years after)
Complete sanitary surveys for NCWSs and remaining CWSs[3]	December 31, 2014 (and every 5 years after)

1. Individual states may have earlier compliance requirement dates.
2. If systems providing at least 4-log treatment of viruses want to avoid triggered source water monitoring, they must submit written notification to the state by December 1, 2009, and begin compliance monitoring by December 1, 2009.
3. May include CWSs providing at least 4-log treatment of viruses for all their ground water sources and CWSs that have an outstanding performance record, as determined by the state.

WHAT ARE THE VIOLATIONS ASSOCIATED WITH THE GWR?

If a system is in violation of a GWR requirement, the system must report the problem to the state and notify the public. Note that when a system has a ground water source with a fecal indicator-positive sample, it is a *situation* and not a violation. In accordance with the GWR, the system must still meet the Tier 1 Public Notification (PN) requirements.

Situation or Violation	Report to State	Notify Public[1]	Tier	PN Method
Source water monitoring sample fecal indicator-positive for *E. coli*, enterococci, or coliphage and not invalidated by the state	Within 24 hours	Within 24 hours	1	TV, hand-delivery, public postings, or other state-approved method (consult your state)
Failure to complete required corrective action	Within 48 hours	Within 30 days	2	Hand-delivery, direct mail, public postings, newspaper, or radio announcements
Failure to comply with a state-approved corrective action plan and schedule [2]	Within 48 hours	Within 30 days	2	Hand-delivery, direct mail, public postings, newspaper, or radio announcements
For systems conducting compliance monitoring, failure to maintain 4-log treatment of viruses and restore 4-log treatment within 4 hours	Within 48 hours	Within 30 days	2	Hand-delivery, direct mail, public postings, newspaper, or radio announcements
Failure to conduct required source water monitoring (triggered, additional, or assessment)	Consult your State	Within 12 months	3	CCR [2] (consult your state for other specific PN requirements)
Failure to conduct required compliance monitoring	Consult your State	Within 12 months	3	CCR [2] (consult your state for other specific PN requirements)
Uncorrected significant deficiency	-	Annually	-	Special Notice[2]
Unaddressed fecal contamination (CWSs only)	-	Annually	-	Special Notice in CCR (CWSs only)

1. Systems are required to send a copy of the PN to the state within 10 days of making the notification.
2. Community GWSs may use the Consumer Confidence Report (CCR) to make this notification if it meets the requirement to notify the public within 12 months. NCWSs must use an alternate form of notice approved by their state.

For more information on GWR notification requirements, please refer to:

- **"Ground Water Rule Factsheet: Public Notification, Consumer Confidence Report, and Special Notice Requirements for Community Water Systems" and**
- **"Ground Water Rule Factsheet: Public Notification and Special Notice Requirements for Non-Community Water Systems."**

ADDITIONAL GUIDANCE MATERIALS

The following guidance materials for states and PWSs have been released or will be released in 2008:

Ground Water Rule: A Quick Reference Guide – This guide provides a description of the GWR and includes critical deadlines and requirements. www.epa.gov/ogwdw/disinfection/gwr/compliancehelp.html.

Ground Water Rule Factsheets – Including factsheets on GWR general requirements, monitoring requirements, and Public Notice, Consumer Confidence Reports, and Special Notices.

Ground Water Sanitary Survey Guidance Manual. November 2007. EPA 815-D-07-006 – This guidance provides states, tribes, and other primacy agencies with a brief review of the sanitary survey regulatory provisions, give examples of what may constitute a significant deficiency, and provide a checklist of elements that should be evaluated during the course of a sanitary survey inspection. www.epa.gov/ogwdw/disinfection/gwr/compliancehelp.html.

Source Water Assessment Guidance Manual. September 2007. EPA 815-R-07-023 – This guidance provides states, tribes, and other primacy agencies with a brief review of hydrogeologic sensitivity assessments, an overview of the characteristics of a sensitive aquifer, information about how source water assessments may be used, and information about how to determine if a sensitive aquifer has a hydrogeologic barrier. www.epa.gov/ogwdw/disinfection/gwr/compliancehelp.html.

Ground Water Rule Source Water Monitoring Methods Guidance Manual. July 2007. EPA 815-R-07-019 – This guidance provides GWSs, states, tribes, and other primacy agencies with a brief review of the source water monitoring provisions. Primacy agencies may select fecal indicators (e.g., *E. coli*, enterococci, coliphage) that systems would be required to test for in the ground water source sample. The source water monitoring guidance manual provides criteria to assist primacy agencies in their determination of which fecal indicator(s) may be most appropriate. www.epa.gov/ogwdw/disinfection/gwr/compliancehelp.html.

Corrective Action Guidance Manual (under development) – This guidance will provide states, tribes, other primacy agencies and GWSs with an overview of the treatment technique requirements of the GWR. The guidance manual will provide assistance with determining the information that should be included in a system's corrective action plan.

Consecutive System Guide for the Ground Water Rule. July 2007. EPA 815-R-07-020 – This guidance describes the regulatory requirements of the GWR that apply to wholesale GWSs and the consecutive systems that receive and distribute that ground water supply. www.epa.gov/ogwdw/disinfection/gwr/compliancehelp.html.

Complying with the Ground Water Rule: Small Entity Compliance Guide: One of the Simple Tools for Effective Performance (STEP) Guide Series. July 2007. EPA 815-R-07-018 – This document is intended to be an official compliance guide to the GWR for small PWSs, as required by the Small Business Regulatory Enforcement Fairness Act of 1996. This guide contains a general introduction and background for the GWR, describes the specific requirements of the GWR and provides information on how to comply with those requirements. www.epa.gov/ogwdw/disinfection/gwr/compliancehelp.html.

For additional information, please contact the Safe Drinking Water Hotline at 1-800-426-4791, or visit www.epa.gov/safewater/disinfection/gwr.

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Ground Water Rule Factsheet: Monitoring Requirements

WHAT IS THE GROUND WATER RULE?

The U.S. Environmental Protection Agency (EPA) published the Ground Water Rule (GWR) on November 8, 2006. One goal of the GWR is to provide increased protection against microbial pathogens, specifically bacterial and viral pathogens, in public water systems (PWSs) that use ground water. Instead of requiring disinfection for all ground water sources, the GWR establishes a risk-targeted approach to identifying ground water sources that are susceptible to fecal contamination. The GWR requires systems with ground water sources at risk of microbial contamination to take corrective action to protect consumers from harmful bacteria and viruses. Monitoring is a key element of this risk-targeted approach.

There are two types of monitoring required by the GWR:

- **Source Water Monitoring**: ***Triggered*** source water monitoring is used to determine if fecal contamination is present in the ground water source. Triggered source water monitoring is required for any GWS that has a positive total coliform result under the Total Coliform Rule (TCR) routine sampling and does not provide and monitor for 4-log treatment of viruses. Alternatively, states may require GWSs with sources that seem susceptible to fecal contamination to conduct ***assessment*** source water monitoring.

- **Compliance Monitoring**: Systems that notify the state that they provide and monitor for 4-log treatment of viruses are required to conduct compliance monitoring.

WHAT ARE THE SOURCE WATER MONITORING REQUIREMENTS?

Some ground water systems (GWSs) will be required to conduct triggered source water monitoring or assessment source water monitoring of a fecal indicator (e.g., *E. coli*, enterococci, or coliphage) to detect microbial contamination in the source.

Triggered Source Water Monitoring

Within 24 hours of being notified of a positive total coliform result under routine TCR monitoring, a GWS must collect at least one ground water source sample from each source in use when the positive total coliform result under the TCR was collected. These samples are **triggered source water samples**.

If a triggered source water sample is positive for a fecal indicator, the state will require the system to take corrective action or take five **additional samples** from the same source within 24 hours of notification of the fecal indicator-positive result and analyze the additional samples for a fecal indicator. If any one of the five additional samples is fecal indicator-positive, the system must take corrective action.

Triggered Source Water Monitoring Exceptions

A state may waive the triggered source water monitoring requirement if the state determines and documents, in writing, that the total coliform-positive routine sample is the result of a documented distribution system deficiency.

In addition, states may develop criteria for distribution system conditions that cause total coliform-positive samples. A GWS can document to the state that it met the state criteria within 30 days of the total coliform-positive sample and be exempt from collecting the triggered source water sample(s).

Representative Source Water Monitoring

With state approval, GWSs with more than one ground water source may fulfill the triggered source water monitoring requirements by taking a ground water sample at a representative source. The state may require the system to submit a triggered source water monitoring plan that identifies the sources that are representative of its TCR sampling sites.

GWSs providing at least 99.99 percent (4-log) treatment of viruses (using inactivation, removal, or a state-approved combination of inactivation and removal) of all of their ground water can notify the state of this treatment and would not be required to conduct triggered source water monitoring. Those systems are, however, required to conduct compliance monitoring to show they are providing consistent and sufficient treatment. Compliance monitoring requirements depend on the system's size and the type of treatment it is using. Compliance monitoring requirements are discussed below.

Small Systems

GWSs serving fewer than 1,000 people that have a total coliform-positive result under the TCR may use the triggered source water monitoring sample collected from the ground water source to meet both the triggered source water monitoring requirement of the GWR as well as part of the repeat sampling requirement of the TCR (if the state approves the use of *E. coli* as a fecal indicator for source water monitoring).

Consecutive Systems

A consecutive system with a positive routine total coliform result under the TCR must notify its wholesale system(s) within 24 hours of being notified of the positive sample.

Wholesale Systems

A wholesale system that receives notice from a consecutive system of a positive total coliform result under routine monitoring of the TCR must collect a triggered source water sample from its ground water source(s) and analyze the source water sample(s) for a fecal indicator within 24 hours of being notified by the consecutive system. If the triggered source water sample is positive for the fecal indicator, the wholesale system must notify all consecutive systems served by that source within 24 hours of the positive sample result. The wholesale system and any consecutive systems served by the fecal indicator-positive source must all notify their consumers within 24 hours of learning of the result. If the state does not require corrective action for this fecal indicator-positive sample, the wholesale system must collect five additional source water samples from the same source within 24 hours of receiving notification of the fecal indicator-positive sample.

Invalidation of Source Water Monitoring Samples

If the state provides written documentation that a fecal indicator-positive sample does not reflect source water quality, or if a GWS provides the state with written notice from the laboratory that improper analysis of a sample occurred, the state may invalidate the fecal indicator-positive sample. Within 24 hours of receiving the state sample invalidation notification, a GWS is required to take another sample and have it analyzed for the same fecal indicator.

Assessment Source Water Monitoring

States may require GWSs with sources that seem susceptible to fecal contamination to conduct assessment source water monitoring. States may require assessment source water monitoring at any time, on a case-by-case basis. Based on the results of the assessment source water monitoring, systems may have to take corrective action.

Assessment source water monitoring requirements are in addition to triggered source water monitoring requirements. A system may, however, use a triggered source water sample to meet part of the assessment source water monitoring requirement.

Analytical Methods	
Fecal Indicator	**Method Name**
E. coli	9223 B EPA Method 1604 9221 F 9222 G
Enterococci	9230B 9230C EPA Method 1600
Coliphage	EPA Method 1601 EPA Method 1602

New Sources and Systems

GWSs that begin service from a new source after November 30, 2009, may be required by their state to conduct assessment source water monitoring. The state may require the system to begin assessment source water monitoring before the new source provides water to the public.

Other Source Water Monitoring Details

Sampling Locations for All Source Water Monitoring

Triggered, additional, and assessment source water monitoring samples must be collected prior to treatment or at a state-approved location.

Sample Volume

All source water samples must be at least 100 mL for all fecal indicator analytical methods.

WHAT ARE THE COMPLIANCE MONITORING REQUIREMENTS?

Compliance monitoring requirements apply to systems that provide 4-log treatment of viruses and are not subject to triggered source water monitoring requirements. These systems must:

- Notify the state that they provide 4-log treatment of viruses.
- Conduct compliance monitoring rather than triggered source water monitoring.
  - Systems with existing ground water sources must notify the state in writing by December 1, 2009, that they provide at least 4-log treatment of viruses for the sources.
  - Systems with ground water sources placed into service after November 30, 2009, must notify the state in writing that they provide at least 4-log treatment of viruses of those sources and begin compliance monitoring within 30 days of placing the source in service or conduct triggered source water monitoring.

Compliance Monitoring

Compliance monitoring ensures that systems already providing 99.99 percent (4-log) inactivation, removal, or a state-approved combination of inactivation and removal of viruses are achieving this level of treatment.

After November 30, 2009, GWSs that begin providing at least 4-log treatment of viruses must notify the state and conduct compliance monitoring to avoid being required to conduct triggered source water monitoring. Systems that provide 4-log treatment should check with their state regulators to see if they need to satisfy any additional state compliance monitoring requirements (e.g. Stage 1 Disinfectants and Disinfection Byproducts Rule (DBPR)) beyond the requirements listed below.

System Type	Monitor For	Frequency	Sample Location
Disinfecting GWSs serving ≤ 3,300	Residual disinfectant concentration (must meet state minimum)	Daily or continuous[1,2]	State-approved location(s)
Disinfecting GWSs serving > 3,300		Continuous only[1,3]	
GWSs using membrane filtration	Membrane filtration process effectiveness	Consult state for specific information	
GWSs using state-approved alternative treatment	Alternative treatment effectiveness		

1. Provisions available for equipment failure.
2. If any daily grab sample is less than the minimum disinfectant residual concentration, the system must take follow-up samples every 4 hours until the residual meets or exceeds the minimum.
3. System must record the lowest residual disinfectant concentration each day water from the ground water source is served to the public.

What are the Compliance Deadlines Associated with GWR Monitoring?

Individual states may have earlier compliance requirement dates.

Requirements	Deadline:
Source Water Monitoring	
• Triggered	Beginning December 1, 2009
• Additional	
• Assessment	
Notification of 4-log treatment of viruses (for existing ground water source(s))	By December 1, 2009
Compliance Monitoring (for systems with 4-log treatment of viruses)	Beginning December 1, 2009

What are the Monitoring Violations Associated with The GWR?

If a system is in violation of a GWR monitoring requirement, the system must report the problem to the state and notify the public. Systems are required to send a copy of the public notification (PN) to the state within 10 days of the notification. Note that when a system has a ground water source with a fecal indicator-positive sample, it is a *situation* and not a violation.

Situation or Violation	Report to State	Notify Public	Tier	PN Method
Source water monitoring sample is fecal indicator-positive for *E. coli*, enterococci, or coliphage and not invalidated by the state	Within 24 hours	Within 24 hours	1	TV, hand-delivery, public postings, or other state-approved method (consult your state)
Failure to conduct required source water monitoring (triggered, additional, or assessment)	Consult your State	Within 12 months	3	Consumer Confidence Report (CCR)[1] (consult your state for other specific PN requirements)
Failure to conduct required compliance monitoring	Consult your State	Within 12 months	3	CCR[1] (consult your state for other specific PN requirements)

1. The CCR may be used by CWSs to make this notification if it meets the requirement to notify the public within 12 months. Non-community water systems must use an alternate form of Tier 3 notice approved by their state.

Community GWSs must also report any fecal indicator-positive samples in their CCR that addresses the year in which the samples were collected.

ADDITIONAL GUIDANCE MATERIALS

The following guidance materials for states and PWSs have been released or will be released in 2008:

Ground Water Rule: A Quick Reference Guide – This guide provides a description of the GWR and includes critical deadlines and requirements. www.epa.gov/ogwdw/disinfection/gwr/compliancehelp.html.

Ground Water Rule Factsheets – Including factsheets on GWR general requirements, monitoring requirements, and Public Notice, Consumer Confidence Reports, and Special Notices.

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Corrective Action Guidance Manual (under development) – This guidance will provide states, tribes, other primacy agencies and GWSs with an overview of the treatment technique requirements of the GWR. The guidance manual will provide assistance with determining the information that should be included in a system's corrective action plan.

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For additional information, please contact the Safe Drinking Water Hotline at 1-800-426-4791, or visit www.epa.gov/safewater/disinfection/gwr.

Ground Water Rule Factsheet: Sanitary Surveys

WHAT IS THE GROUND WATER RULE?

The U.S. Environmental Protection Agency (EPA) published the Ground Water Rule (GWR) on November 8, 2006. One goal of the GWR is to provide increased protection against microbial pathogens, specifically bacterial and viral pathogens, in public water systems (PWSs) that use ground water (or ground water systems (GWSs)). Instead of requiring disinfection for all ground water sources, the GWR establishes a risk-targeted approach to identifying ground water sources that are susceptible to fecal contamination. The GWR requires GWSs with ground water sources at risk of microbial contamination to take corrective action to protect consumers from harmful bacteria and viruses. Sanitary surveys are an important way for states to identify at-risk systems.

WHAT IS A SANITARY SURVEY?

A sanitary survey provides an on-site review of how a GWS is maintained and operated. The survey is conducted by a trained surveyor, who reviews the system's water source, equipment, facilities, and treatment procedures. The purpose of the survey is to:

- Ensure that the GWS' operational, monitoring, reporting, and recordkeeping practices are in compliance with drinking water regulations.
- Identify any significant deficiencies.
- Better ensure that safe drinking water is distributed to the public.

Furthermore, the sanitary survey is a proactive public health measure that allows states to better understand a GWS' progress and needs.

WHAT ARE THE DIFFERENCES BETWEEN THE GWR AND THE TOTAL COLIFORM RULE?

Total Coliform Rule & Sanitary Surveys

The Total Coliform Rule (TCR) was published on June 29, 1989, by the EPA. Under the TCR, community water systems (CWSs) and non-community water systems (NCWSs) that collect fewer than 5 TCR samples per month were required to receive a sanitary survey every 5 years. NCWSs that use protected and disinfected ground water were only required to receive a sanitary survey once every 10 years. Furthermore, the TCR did not state what elements needed to be evaluated during the sanitary survey.

GWR & Sanitary Surveys

The GWR sanitary survey requirement will increase public health protection by requiring more frequent and complete sanitary surveys. The GWR requires that all community GWSs receive a sanitary survey every 3 years. Non-community GWSs must have a sanitary survey at least every 5 years. If the state determines that a community GWS has outstanding performance or the GWS provides 4-log treatment of viruses, the state can conduct a sanitary survey of the community system every 5 years instead of every 3 years. This provides states with flexibility and gives them the option of reducing their survey workload. For both community and non-community GWSs the sanitary survey must include a review of all eight elements described in this factsheet. All eight elements do not need to be reviewed at the same time, as long as they are reviewed within the 3- or 5- year timeframe specified above.

How Often is a Sanitary Survey Administered for GWSs?

Ground Water System Type	Minimum Frequency of Surveys
Community GWSs	Every 3 years
Community GWSs that the state determines have outstanding performance OR provide 4-log treatment of viruses (i.e., performance criteria)[1]	Every 5 years
Non-community GWSs	Every 5 years

Dates to Keep in Mind

December 31, 2012

This is the last day states have to complete the initial eight element sanitary survey for all community GWSs[2] under the GWR.

December 31, 2014

This is the last day states have to complete the initial eight element sanitary survey for non-community GWSs and for those community GWSs that the state determines have met state performance criteria for outstanding performance or provide 4-log treatment of viruses.[1]

What Elements are Examined During the Survey?

The GWR requires that a sanitary survey include a review of eight elements. The state will identify significant deficiencies found during the survey. The GWS will then need to take corrective action to fix any significant deficiencies found.

Eight Elements of the Sanitary Survey

- *Source*
  Protecting the source prevents contaminants and pathogens from reaching consumers. The state will review information relating to source water quality and wellhead protection. Observations will be made about well construction, potential sources of contamination, setback distances, source quantity and capacity, well locations, source water transmission mains, site security, and general housekeeping.

Possible source significant deficiencies

- Well near source of fecal contamination
- Well in flood zone
- Improperly constructed well
- Spring boxes are poorly constructed and/or subject to flooding

- *Treatment*
  Treatment varies among GWSs based on the quality of the source water and state regulatory requirements. The state will take into consideration design criteria, plant records, and past inspections during the review. The overall design, operation, maintenance, and management of the treatment facility will be examined.

Possible treatment significant deficiencies

- Improper application of treatment chemicals
- Lack of redundant mechanical components where treatment is required
- Unprotected cross-connections with treatment systems
- Inadequate monitoring

1. Performance criteria are established when a community GWS provides a 4-log inactivation/treatment of viruses or has an outstanding performance record document for previous sanitary surveys. Furthermore, a community GWS that has an outstanding performance record cannot have a history of any violations under TCR since its last sanitary survey.
2. Except for those that meet performance criteria.

- *Distribution System*
  Improper upkeep and maintenance of pipes and fixtures comprising the distribution system can compromise the safety of drinking water. Since the infrastructure is typically underground, the state will usually do a paper review of schematics, operation and maintenance records, operating procedures, construction standards, and distribution system water quality data.

Possible distribution system significant deficiencies

- Low or negative pressure that could result in contamination
- Lack of system flushing
- Unprotected cross-connections

- *Finished Water Storage*
  The condition of the storage facility can affect both water quality and water quantity. The state will review the GWS' files; perform field inspections to assess the tank's integrity, operational readiness, site security, and potential sanitary risks; ensure maintenance checks have been completed; and discuss current operation and maintenance (O&M) procedures with staff.

Possible finished water storage significant deficiencies

- Inadequate internal cleaning/maintenance of storage tanks
- Improper screening of overflow pipes, drains, or vents
- Necessary repairs of storage tank roofs or covers

- *Pumps, Pump Facilities, and Controls*
  The purpose of reviewing the pumps is to see if they are in proper working order, are the best fit for their intended use, and to determine their reliability and establish if there are any sanitary risks. The state will obtain information about the pumps, including available data from previous sanitary surveys, the emergency power system (if available), pump tests, and remote monitoring controls and alarms.

Possible pumps, pump facilities, and controls significant deficiencies

- Inadequate pump capacity
- Inadequate maintenance
- Inadequate/inoperable control system

- *Monitoring, Reporting, and Data Verification*
  Verifying the quality of the drinking water distributed to the public ensures that the water complies with drinking water regulations and requirements. The state will determine whether site sampling and monitoring plans are being followed and requirements are being met by checking test results, monthly reports, and daily logs. The surveyor will determine whether the system has complete, up-to-date, and reasonable monitoring data.

Possible monitoring, reporting, and data verification significant deficiencies

- Not monitoring according to site sampling plan or monitoring plan
- Not meeting reporting requirements
- Improper recordkeeping

- *System Management and Operation*
  Proper management can provide a GWS with direction, sufficient funding, and strong support. Reviewing a system's goals, plans, and budgets can give the state a good idea of whether the system's team is working well together or might need some assistance. The state will evaluate whether the GWS is sufficiently staffed and has enough funding for equipment to operate in a sustainable and safe manner.

Possible system management and operation significant deficiencies

- Failure to meet water supply demands
- No approved emergency response plan
- Inadequate follow-up to deficiencies

- *Operator Compliance with State Requirements*
  Operators and staff must be properly trained based on system type, size, and treatment. The state will confirm that operators are properly certified for their roles and responsibilities.

Possible operator compliance with state requirements significant deficiencies

- Operator is not qualified as required by the state
- Lack of operator training

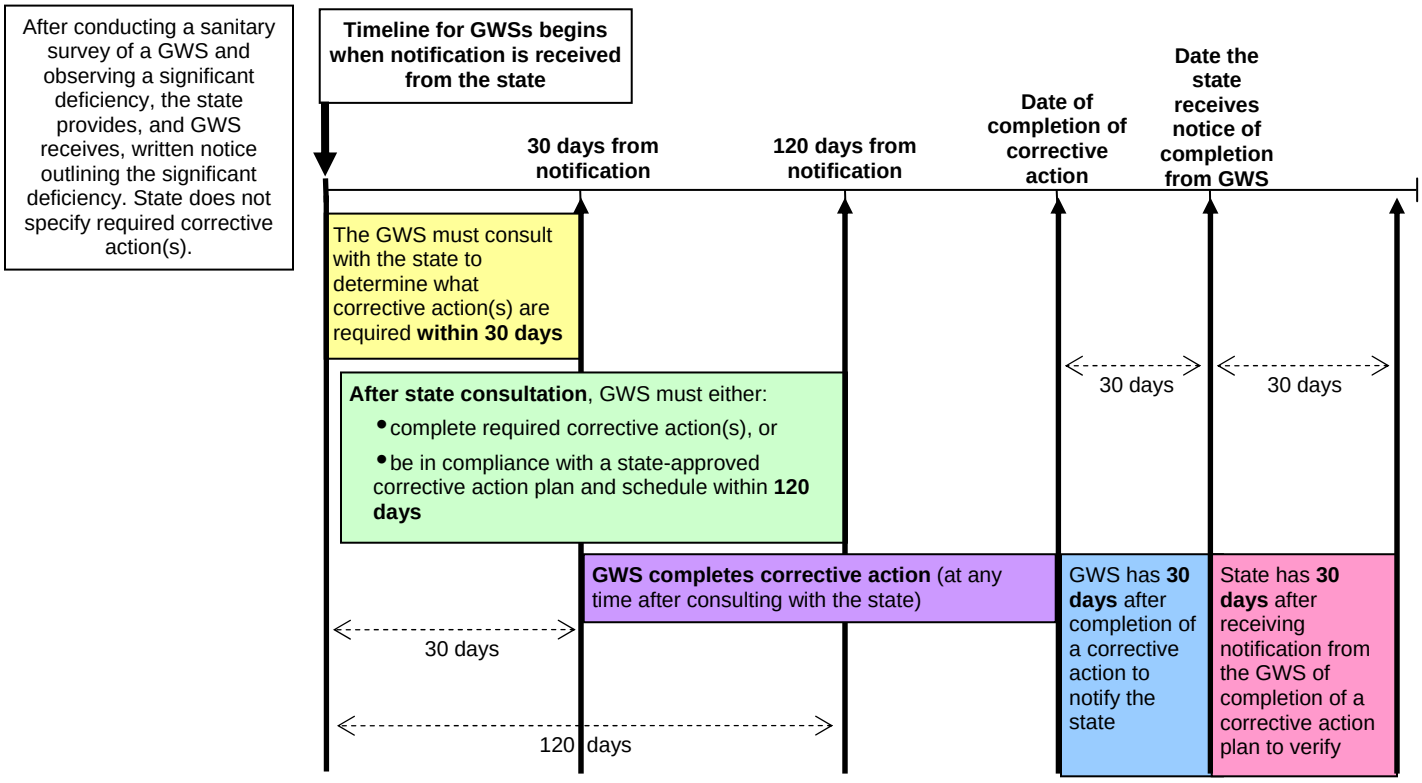
What Happens if a Significant Deficiency is Identified?

After the sanitary survey has been completed, the state must provide written notification to the GWS no more than 30 days after a significant deficiency has been identified. The state may also specify the corrective action(s) it requires the GWS to complete and may provide deadlines for those actions. If the state does not specify the corrective action(s) required, the GWS has 30 days from receiving written notice from the state to consult with the state regarding appropriate corrective action needed to address the significant deficiency. The GWS has 120 days after the ***initial state notification*** of a significant deficiency to complete the required corrective action or be in compliance with a state-approved corrective action plan and schedule. Failure to comply with the required corrective action plan or schedule will result in a treatment technique (TT) violation for the GWS. The GWS must notify the state within 30 days of completing the required corrective action.

Corrective Action Alternatives

- Correct all significant deficiencies.
- Provide alternative source of water.
- Eliminate the source of contamination.
- Provide 4-log treatment of viruses before first customer.

Example Timeline



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For additional information, please contact the Safe Drinking Water Hotline at 1-800-426-4791, or visit www.epa.gov/safewater/disinfection/gwr.

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Ground Water Rule Factsheet: Public Notification, Consumer Confidence Report, and Special Notice Requirements for Community Water Systems

WHAT IS THE GROUND WATER RULE?

The U.S. Environmental Protection Agency (EPA) published the Ground Water Rule (GWR) on November 8, 2006. One goal of the GWR is to provide increased protection against microbial pathogens, specifically bacterial and viral pathogens, in public water systems (PWSs) that use ground water. Instead of requiring disinfection for all ground water sources, the GWR establishes a risk-targeted approach to identifying ground water sources that are susceptible to fecal contamination. The GWR requires ground water systems (GWSs) at risk of microbial contamination to take corrective action to protect consumers from harmful bacteria and viruses. Notifying the public of potential risks is a key element of this risk-targeted approach. Procedures for notifying the public differ depending on whether a system is a community or a non-community water system (NCWS). This factsheet describes the GWR notification requirements for community water systems (CWSs).

A system is a **CWS** if it is a PWS that is connected to at least 15 year-round residences or regularly serves at least 25 persons in a residential setting on a year-round basis.[1]

WHY DOES THE GWR REQUIRE PUBLIC NOTIFICATION?

The GWR addresses pathogens that can be found in GWSs and steps GWSs must take to protect their customers. Violations and situations of the GWR are also addressed by two other drinking water regulations related to notifying the public: the Public Notification (PN) Rule and the Consumer Confidence Report (CCR) Rule. The GWR requires PN for additional situations and violations related to ground water and adds to the required content of CCRs.

GWSs are required to notify the public because these circumstances can present moderate to severe risks to public health.

The GWR, the PN Rule, and the CCR Rule

The **PN Rule** requires all PWSs to give notice to persons served by the water system for significant events, including violations of national primary drinking water regulations (NPDWRs) and waterborne emergencies.

- The GWR amends the PN Rule by requiring notice for detection of a fecal indicator in a ground water source sample, treatment technique violations, and monitoring violations.

The **CCR Rule** requires CWSs to provide CCRs to their customers, giving an annual report on water quality.

- The GWR amends the CCR requirements and includes language to be used when informing the public of significant deficiencies and fecal indicator-positive results in ground water source samples.

1. All other PWSs that do not fit these criteria are classified as NCWSs. For information on requirements for NCWSs, please see "Ground Water Rule Factsheet: Public Notification and Special Notice Requirements for Non-Community Water Systems."

WHAT TYPES OF NOTIFICATION ARE REQUIRED BY THE GWR?

The type of notification required will differ depending on the severity of the situation or violation. The general categories of notification are:

- Tier 1, 2, or 3 PN
- Special Notice (in CCRs)
- CCR (other notice)

The state has the authority to alter the designated tier of a certain situation or violation, or to require additional or repeated notices.

The following table outlines the various situations or violations that require notification and the corresponding types of notification that are required.

Issue	Notification Required
Fecal indicator-positive ground water source sample[1]	Tier 1 PN, Special Notice in CCR, and CCR
Failure to take corrective action	Tier 2 PN, CCR
Failure to maintain at least 4-log treatment of viruses	Tier 2 PN, CCR
Failure to meet monitoring requirements	Tier 3 PN, CCR
Uncorrected significant deficiency[2]	Special Notice in CCR
Unaddressed fecal indicator-positive ground water source sample[3]	Special Notice in CCR

1. Consecutive systems served by the ground water source must also notify the public.
2. Systems must continue to notify the public annually until the significant deficiency has been corrected.
3. Systems must put a notice in the CCR annually until the positive source water sample has been addressed.

Each issue outlined above can result from one of the following situations or requirements:

- **Fecal indicator-positive ground water source samples** are detected during **1)** triggered source water monitoring, **2)** additional source water monitoring (if it is required by the state), and **3)** assessment source water monitoring (if it is required by the state). (See "Ground Water Rule Factsheet: Monitoring Requirements" for more information).
- **State corrective action requirements** can result from **1)** the discovery of a significant deficiency, or **2)** a fecal indicator-positive source water sample.
- **Failure to maintain at least 4-log treatment of viruses** occurs when a system is unable to correct treatment failures within 4 hours. This situation results in a treatment technique violation.
- **Monitoring violations** can result from failure to adhere to state requirements for **1)** triggered source water monitoring, **2)** additional source water monitoring**, 3)** assessment source water monitoring, and **4)** compliance monitoring (for systems that maintain 4-log treatment of viruses). (See "Ground Water Rule Factsheet: Monitoring Requirements" for more information).

Tiers of Public Notification

Tier 1 (Immediate notice):
This tier is for violations and situations with significant potential to have serious and immediate adverse effects on human health as a result of short-term exposure. Notice is required within **24 hours**.

Tier 2 (Notice as soon as possible):
This tier is for other violations and situations with the potential to have adverse effects on human health that do not pose an immediate risk. Notice is required within **30 days**.

Tier 3 (Annual notice):
This tier is for all other violations and situations requiring a public notice not included in Tier 1 and Tier 2 or that do not have a direct impact on human health. These violations are typically monitoring and reporting violations. Notice is required within **12 months** and may be included in the CCR, since CWSs must produce CCRs by July 1st of every year.

- **Significant Deficiencies** are identified by the state during sanitary surveys and on other occasions. (See "Ground Water Rule Factsheet: Sanitary Surveys" for more information).

WHAT TYPES OF SITUATIONS REQUIRE NOTIFICATION UNDER THE GWR?

Situations requiring Tier 1 PN

- A system is notified of a **fecal indicator-positive ground water source sample** (either a triggered source water monitoring sample, one of its **five additional samples** required by a positive triggered source water monitoring sample, or an assessment source water monitoring sample) that is not invalidated by the state.
- A system has a **replacement source water sample** that is fecal indicator-positive.
  - For these types of situations, **CWSs** must also place a ***Special Notice*** in the year's CCR and must add the fecal indicator-positive result to the ***regulated contaminant table*** in the CCR.

Situations requiring Tier 2 PN

- A GWS has a **treatment technique (TT) violation** under the GWR. TT violations result from:
  - Failing to comply with or be on a compliance schedule for a state-approved ***corrective action plan*** within ***120 days*** of being notified of a ***significant deficiency***.
  - Failing to comply with or be on a compliance schedule for a state-approved ***corrective action plan*** within ***120 days*** of being notified of a ***fecal indicator-positive source water sample***.
  - Failing to **maintain at least 4-log treatment of viruses** ***for more than 4 hours***.
    - **CWSs** that have TT violations must also place ***information about the violation*** in the year's CCR.

Situations requiring Tier 3 PN

- A GWS fails to meet **GWR monitoring requirements** if the system**:**
  - Fails to conduct ***triggered source water monitoring*** within ***24 hours*** of being notified of a total coliform-positive routine sample.
  - Fails to collect ***five additional samples*** after a fecal indicator-positive triggered source water sample (unless the state requires corrective action).
  - Fails to collect a ***replacement source water sample*** within ***24 hours*** of being notified that a fecal indicator-positive sample has been invalidated by the state.
  - Fails to conduct or follow the requirements for **assessment source water monitoring** as directed by the state for **existing** or **new sources** (coming into services after November 30, 2009).
- A GWS fails to meet **compliance monitoring requirements** if the system:
  - Does not conduct triggered source water monitoring and fails to conduct monitoring to demonstrate compliance with ***4-log treatment*** requirements.
    - **CWSs** that violate monitoring requirements must also place ***information about the monitoring violation*** in the year's CCR.

Situations requiring Special Notice

- **Fecal Indicator-Positive Source Water Sample.**
  - A CWS is notified of a fecal indicator-positive **triggered source water sample** that is not invalidated by the state.
  - A CWS is notified that one of its required **five additional samples** that is fecal indicator-positive.
  - A CWS is notified that an **assessment source water monitoring sample** is fecal indicator-positive.
- **Uncorrected significant deficiency or unaddressed fecal comtanimation.**
  - A CWS is unable to correct a significant deficiency or address the fecal contamination before the next CCR is distributed.

What special elements must be included in a Special Notice?

- The **nature** of the significant deficiency or the source of the fecal contamination (if known).
- The **date** the significant deficiency was identified by the state or the **dates** of the fecal indicator-positive ground water source samples.
- If the fecal contamination has been **addressed** and the **date** of such action.
- For each significant deficiency or fecal contamination, the state-approved **plan and schedule for correction**, including interim measures, progress to date, and any interim measures completed.
- The **potential health effects** of a valid fecal indicator-positive ground water source sample (using the health effects language of Appendix A of subpart O).
- For GWSs with large populations of non-English speaking consumers, **information on the importance of the notice** in the appropriate language(s), as determined by the state.

- CWSs must include the Special Notice in their CCR and must continue to **notify the public annually** until the significant deficiency or the fecal contamination has been addressed.

WHAT ARE THE NOTIFICATION REQUIREMENTS?

Each category of notification has different requirements. CWSs may use a variety of delivery methods as long as these methods have been approved by the state and are used to reach as many consumers as possible. The following table describes the GWR notification requirements.

Notification Requirements

Notice Type	Deadline for Initial Notice	Repeated Notices[1]	Consultation with the State[2]	Delivery Methods[3]
Tier 1 PN	24 hours	As dictated by the state	24 hours	Broadcast media (radio or television), hand delivery, posting, or any other method as needed to reach as many consumers as possible.
Tier 2 PN	30 days	Every 3 months	Within 48 hours	Mail, hand delivery, or any other method as needed to reach as many consumers as possible.
Tier 3 PN	1 year[4]	Annually	As soon as is practical/ possible	Mail, hand delivery (public notice delivery may be provided by CCR if one year requirement is met), or any other method as needed to reach as many consumers as possible.
Special Notice	With the year's CCR	Annually	As soon as is practical/ possible	A special notice must be placed in the CCR and must include the special elements described above.
CCR (other notice)	With the year's CCR	Annually	As soon as is practical/ possible	Information about fecal indicator detections, TT violations, and monitoring violations must also be included in the CCR.

1. Repeated notices are required if the violation or situation persists, unless otherwise directed by the primacy agency. Posted notices must remain posted and may need periodic updating.
2. Systems are required to send a copy of the PN to the state within 10 days of the notification. Systems must also keep documentation of public notices as required under § 141.403(a)(7) for a period of not less than 3 years.
3. Primacy agencies may approve other methods.
4. EPA recommends consolidating all Tier 3 notifications required within a given year into one notice as long as the notice is issued within 12 months of the earliest violation.

WHAT IS THE STATE'S ROLE IN GWR NOTIFICATION?

State primacy agencies can serve as a valuable resource for helping systems maintain compliance with the GWR. States also have authority to determine the appropriate notification requirements for a GWS following a situation or violation. Under the GWR, states must:

- Be available to consult with GWSs after a significant deficiency has been identified or a fecal indicator-positive sample has been detected. (However, GWSs must still notify the public by the required deadline even if the state has not been consulted.)
- Approve notification processes.

Under this rule states can:

- Require a more stringent PN tier for certain violations if it is deemed necessary to protect public health.
- Invalidate a positive ground water source sample if it is determined that the sample is not related to source water quality (thus, not requiring notification unless an additional sample is positive).
- Require systems to distribute additional notices if it is deemed necessary.

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Ground Water Rule Factsheet: Public Notification and Special Notice Requirements for Noncommunity Water Systems

WHAT IS THE GROUND WATER RULE?

The U.S. Environmental Protection Agency (EPA) published the Ground Water Rule (GWR) on November 8, 2006. One goal of the GWR is to provide increased protection against microbial pathogens, specifically bacterial and viral pathogens, in public water systems (PWSs) that use ground water (or ground water systems [GWSs)). Instead of requiring disinfection for all ground water sources, the GWR establishes a risk-targeted approach to identifying ground water sources that are susceptible to fecal contamination. The GWR requires GWSs at risk of microbial contamination to take corrective action to protect consumers from harmful bacteria and viruses. Notifying the public of potential risks is a key element of this risk-targeted approach. Procedures for notifying the public differ depending on whether a system is a community or a noncommunity water system (NCWS). This factsheet describes the GWR notification requirements for NCWSs.

A system is a **NCWS** if it is a PWS that is not connected to 15 or more year-round residences or does not serve 25 or more persons in a residential setting on a year-round basis.[1] A NCWS may be a transient non-community water system or a nontransient noncommunity water system.

WHY DOES THE GWR REQUIRE PUBLIC NOTIFICATION?

The GWR addresses pathogens that can be found in GWSs and the steps that systems must take to protect their customers. The GWR requires NCWSs to make public notification (PN) for a number of situations and violations related to ground water.

GWS are required to notify the public because these and other circumstances can present risks to public health.

The GWR and the PN Rule

The **PN Rule** requires PWSs to give notice to persons served by the water system for significant events, including violations of national primary drinking water regulations (NPDWRs) and waterborne emergencies.

The GWR amends the PN Rule by requiring notice for detection of a fecal indicator in a ground water source sample, treatment technique violations, and monitoring violations.

WHAT TYPES OF NOTIFICATION ARE REQUIRED BY THE GWR?

The type of notification required will differ depending on the severity of the situation or violation. There are two general categories of notification required by the GWR for NCWSs:

- Tier 1, 2, or 3 PN
- Special Notice

The state also has the authority to alter the designated tier of a certain violation or to require additional or repeated notices.

1. Systems that do not fit these criteria are classified as community water systems (CWSs). For information on requirements for CWSs, please see "Ground Water Rule Factsheet: Public Notification, CCR, and Special Notice Requirements for Community Water Systems."

WHAT TYPES OF SITUATIONS REQUIRE PUBLIC NOTIFICATION UNDER THE GWR?

The following table outlines the various situations or violations that require notification to the public and the corresponding types of notification required.

Issue	Notification Required
Fecal indicator-positive ground water source sample[1]	Tier 1 PN
Failure to take corrective action	Tier 2 PN
Failure to maintain at least 4-log treatment of viruses	Tier 2 PN
Failure to meet monitoring requirements	Tier 3 PN
Uncorrected significant deficiency[2]	Special Notice

1. Consecutive systems served by the ground water source must also notify the public.
2. Systems must continue to notify the public annually until the significant deficiency has been corrected.

- **Fecal indicator-positive ground water source samples** are detected during **1)** triggered source water monitoring, **2)** additional source water monitoring (optional), or 3**)** assessment source water monitoring (if it is required by the state). (See "Ground Water Rule Factsheet: Monitoring Requirements" for more information.)
- **State requirements for corrective action** can result from **1)** the discovery of a significant deficiency or **2)** a fecal indicator-positive source water sample.
- **Failure to maintain at least 4-log treatment of viruses** occurs when a system is unable to correct system failures within 4 hours. This situation results in a treatment technique violation.
- **Monitoring violations** can result from failure to adhere to state requirements for **1)** triggered source water monitoring, **2)** additional source water monitoring**, 3)** assessment source water monitoring, or **4)** compliance monitoring for systems that maintain 4-log treatment of viruses. (See "Ground Water Rule Factsheet: Monitoring Requirements" for more information.)
- **Significant deficiencies** are identified by the state during sanitary surveys and on other occasions. (See "Ground Water Rule Factsheet: Sanitary Surveys" for more information.)

Tiers of Public Notification

Tier 1 (Immediate notice):
This tier is for violations and situations with significant potential to have serious and immediate adverse effects on human health as a result of short-term exposure. Notice is required within **24 hours**.

Tier 2 (Notice as soon as possible):
This tier is for other violations and situations with the potential to have adverse effects on human health that do not pose an immediate risk. Notice is required within **30 days**.

Tier 3 (Annual notice):
This tier is for all other violations and situations requiring public notice not included in Tier 1 and Tier 2 or that do not have a direct impact on human health. These violations are typically monitoring and reporting violations. Notice is required within **12 months**.

Situations requiring Tier 1 PN

- A system is notified of a **fecal indicator-positive ground water source sample** (either a triggered source water monitoring sample, one of its **five additional samples** required by a positive triggered source water monitoring sample, or an assessment source water monitoring sample) *that is not invalidated by the state*.
- A system has a **replacement source water sample** that is fecal indicator-positive.

Situations requiring Tier 2 PN

- A system has a **treatment technique (TT)** violation under the GWR. TT violations result from:
  - Failing to comply with or be on a compliance schedule for a state-approved *corrective action plan* within *120 days* of being notified of a *significant deficiency***.**
  - Failing to comply with or be on a compliance schedule for a state-approved *corrective action plan* within *120 days* of being notified of a *fecal indicator-positive source water sample*.
  - Failing to **maintain at least 4-log treatment of viruses** *for more than 4 hours*.

Situations requiring Tier 3 PN

- A GWS fails to meet GWR **monitoring requirements** if the system:
  - Fails to conduct *triggered source water monitoring* within *24 hours* of being notified of a total coliform-positive routine sample.
  - Fails to collect *five additional samples* after a fecal indicator-positive triggered source water sample (unless the state requires corrective action).
  - Fails to collect a *replacement source water sample* within *24 hours* of being notified that a fecal indicator-positive sample has been invalidated by the state.
  - Fails to conduct or follow the requirements for **assessment source water monitoring** as directed by the state for **existing** or **new sources** (coming into service after November 30, 2009).
- A GWS fails to meet **compliance monitoring** requirements if the system:
  - Fails to conduct monitoring to demonstrate compliance with **4-log treatment** requirements.

Situations requiring Special Notice

- **Uncorrected significant deficiency.**
  - A system is unable to correct a significant deficiency within 1 year of being notified of the significant deficiency.
  - The system must continue to **notify the public annually** until the significant deficiency has been addressed.
  - A state may direct a system to make special notice even if the significant deficiency has been corrected.

What must be included in a Special Notice?
The **nature** of the significant deficiency.
The **date** the significant deficiency was identified by the state.
For each significant deficiency, the state-approved **plan and schedule for correction**, including interim measures, progress to date, and any interim measures completed.
For GWSs with large populations of non-English speaking consumers, **information on the importance of the notice** in the appropriate language(s), as determined by the state.

WHAT ARE THE NOTIFICATION REQUIREMENTS?

Each category of notification has different requirements. NCWSs may use a variety of delivery methods as long as these methods have been approved by the state and are used to reach as many consumers as possible. The following table describes the GWR notification requirements.

Notification Requirements				
Notice Type	Deadline for initial notice	Repeated Notices[1]	Consultation with the State[2]	Delivery Methods[3]
Tier 1 PN	24 hours	As dictated by the state	Within 24 hours	Broadcast media (radio or television), hand delivery, posting, or any other method as needed to reach as many consumers as possible.
Tier 2 PN	30 days	Every 3 months	Within 48 hours	Posting, hand delivery, or mail, or any other method as needed to reach as many consumers as possible.
Tier 3 PN	1 year[4]	Annually	As soon as is practical/ possible	Posting, hand delivery, mail or any other method as needed to reach as many consumers as possible.
Special Notice	1 year	Annually	As soon as is practical/ possible	Posting, hand delivery, mail or any other method as needed to reach as many consumers as possible.

1. Repeated notices are required if the violation or situation persists, unless otherwise directed by the primacy agency. Posted notices must remain posted and may need periodic updating.
2. Systems are required to send a copy of the PN to the state within 10 days of the notification. Systems must also keep documentation of public notices as required under § 141.403(a)(7) for a period of not less than 3 years.
3. Primacy agencies may approve other methods.
4. EPA recommends consolidating all Tier 3 notifications required within a given year into one notice as long as the notice is issued within 12 months of the earliest violation.

What is the State's Role in GWR Notification?

State primacy agencies can serve as a valuable resource for helping systems maintain compliance with the GWR. States also have authority to determine the appropriate notification requirements for a GWS following a situation or violation. Under the GWR, states must:

- Be available to consult with GWSs after a significant deficiency has been identified or a fecal indicator-positive sample has been detected. (However, GWSs must still notify the public by the required deadline even if consultation has not occurred.)
- Determine the appropriate method(s) for NCWSs to inform the public of uncorrected significant deficiencies in their Special Notices.
- Approve notification processes for noncommunity water systems.

Under this rule states can:

- Require a more stringent PN tier (e.g. Tier 1 instead of Tier 2) for certain violations if it is deemed necessary to protect public health.
- Invalidate a positive ground water source sample if it is determined that the sample is not related to source water quality (thus, not requiring notification unless an additional sample is positive).
- Require systems to distribute additional notices if it is deemed necessary.

Additional Guidance Materials

The following guidance materials for states and PWSs have been released or will be released in 2008:

Ground Water Rule: A Quick Reference Guide – This guide provides a description of the GWR and includes critical deadlines and requirements. www.epa.gov/ogwdw/disinfection/gwr/compliancehelp.html.

Ground Water Rule Factsheets – Including factsheets on GWR general requirements, monitoring requirements, and Public Notice, Consumer Confidence Reports, and Special Notices.

Ground Water Sanitary Survey Guidance Manual. November 2007. EPA 815-D-07-006 – This guidance provides states, tribes, and other primacy agencies with a brief review of the sanitary survey regulatory provisions, give examples of what may constitute a significant deficiency, and provide a checklist of elements that should be evaluated during the course of a sanitary survey inspection. www.epa.gov/ogwdw/disinfection/gwr/compliancehelp.html.

Source Water Assessment Guidance Manual. September 2007. EPA 815-R-07-023 – This guidance provides states, tribes, and other primacy agencies with a brief review of hydrogeologic sensitivity assessments, an overview of the characteristics of a sensitive aquifer, information about how source water assessments may be used, and information about how to determine if a sensitive aquifer has a hydrogeologic barrier. www.epa.gov/ogwdw/disinfection/gwr/compliancehelp.html.

Ground Water Rule Source Water Monitoring Methods Guidance Manual. July 2007. EPA 815-R-07-019 – This guidance provides GWSs, states, tribes, and other primacy agencies with a brief review of the source water monitoring provisions. Primacy agencies may select fecal indicators (e.g., *E. coli*, enterococci, coliphage) that systems would be required to test for in the ground water source sample. The source water monitoring guidance manual provides criteria to assist primacy agencies in their determination of which fecal indicator(s) may be most appropriate. www.epa.gov/ogwdw/disinfection/gwr/compliancehelp.html.

Corrective Action Guidance Manual (under development) – This guidance will provide states, tribes, other primacy agencies and GWSs with an overview of the treatment technique requirements of the GWR. The guidance manual will provide assistance with determining the information that should be included in a system's corrective action plan.

Consecutive System Guide for the Ground Water Rule. July 2007. EPA 815-R-07-020 – This guidance describes the regulatory requirements of the GWR that apply to wholesale GWSs and the consecutive systems that receive and distribute that ground water supply. www.epa.gov/ogwdw/disinfection/gwr/compliancehelp.html.

Complying with the Ground Water Rule: Small Entity Compliance Guide: One of the Simple Tools for Effective Performance (STEP) Guide Series. July 2007. EPA 815-R-07-018 – This document is intended to be an official compliance guide to the GWR for small PWSs, as required by the Small Business Regulatory Enforcement Fairness Act of 1996. This guide contains a general introduction and background for the GWR, describes the specific requirements of the GWR and provides information on how to comply with those requirements. www.epa.gov/ogwdw/disinfection/gwr/compliancehelp.html.

For additional information, please contact the Safe Drinking Water Hotline at 1-800-426-4791, or visit www.epa.gov/safewater/disinfection/gwr.

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United States Environmental Protection Agency

Ground Water Rule: A Quick Reference Guide

Overview of the Rule

Title	Ground Water Rule (GWR) 71 FR 65574, November 8, 2006, Vol. 71, No. 216 Correction 71 FR 67427, November 21, 2006, Vol. 71, No. 224
Purpose	Reduce the risk of illness caused by microbial contamination in public ground water systems (GWSs).
General Description	The GWR establishes a risk-targeted approach to identify GWSs susceptible to fecal contamination and requires corrective action to correct significant deficiencies and source water fecal contamination in all public GWSs.
Utilities Covered	The GWR applies to all public water systems (PWSs) that use ground water, including consecutive systems, except that it does not apply to PWSs that combine all of their ground water with surface water or with ground water under the direct influence of surface water prior to treatment.

Public Health Benefits

Implementation of the GWR will result in . . .	▶ Targeted protection for over 70 million people served by ground water sources that are either not disinfected or receive less than 4-log treatment. ▶ Avoidance of 42,000 viral illnesses and 1 related death annually.
Estimated impacts of the GWR include . . .	▶ The annualized present value of the GWR is $19.7 million, with a 90-percent confidence interval of $6.5 to $45.4 million. ▶ Mean annual cost per household is estimated to be less than $1.00 for approximately 96 percent of affected households.

Critical Deadlines and Requirements

For Drinking Water Systems

November 30, 2009	New ground water sources put in place after this date must meet triggered source water monitoring requirements or conduct compliance monitoring.
December 1, 2009	By this date, GWSs conducting compliance monitoring because they provide at least 4-log virus inactivation, removal, or a state-approved combination of these technologies before or at the first customer, must have notified the state and must begin compliance monitoring. The written notification to the state must include engineering, operational, and other information the state requests.
December 1, 2009	GWSs must conduct triggered source water monitoring if the GWS does not provide at least 4-log virus inactivation, removal, or a state-approved combination of these technologies before or at the first customer and the GWS is notified that a sample collected for the Total Coliform Rule (TCR) is total coliform-positive.
December 1, 2009	GWSs for which the state has identified a significant deficiency and GWSs at which at least one of the five additional ground water source samples (or at state discretion, after the initial source sample) has tested positive for fecal contamination must comply with the treatment technique requirements.

For States

August 8, 2008	States are encouraged to submit final primacy applications or extension requests to EPA.
November 8, 2008	Final primacy revision applications for GWR must be submitted to the EPA regional administrator, unless state is granted an extension.
August 8, 2010	States with approved extension agreements are encouraged to submit final primacy applications to EPA.
November 8, 2010	Final primacy applications must be submitted to the EPA regional administrator for states with a full 2 year extension.
December 31, 2012	States must complete initial sanitary survey cycle for all community GWSs except those that meet performance criteria.
December 31, 2014	States must complete initial sanitary survey cycle for all noncommunity GWSs and all community GWSs that meet performance criteria.

Analytical Methods for Source Water Monitoring

Fecal Indicator	Methodology	Method Citation*
E. coli	Colilert Colisure Membrane Filter Method with MI Agar m-ColiBlue24 Test E*Colite Test EC-MUG NA-MUG	9223 B. 9223 B. EPA Method 1604. 9221 F. 9222 G.
Enterococci	Multiple-Tube Technique Membrane Filter Technique Membrane Filter Technique Enterolert	9230 B. 9230 C. EPA Method 1600.
Coliphage	Two-Step Enrichment Presence-Absence Procedure Single Agar Layer Procedure	EPA Method 1601. EPA Method 1602.

*Footnotes regarding methods can be found in 40 CFR 141.402

Treatment Technique Compliance Monitoring	► In order not to be subject to triggered source water monitoring, a GWS can notify the state that it provides at least 4-log treatment of viruses using virus inactivation, removal, or a state-approved combination of 4-log virus inactivation and removal before or at the first customer. The GWS must then begin compliance monitoring designed to show the effectiveness of their treatment processes. ► GWSs that use chemical disinfection and serve more than 3,300 people must continuously monitor their disinfectant concentration. GWSs must maintain the minimum disinfectant residual concentration determined by the state. ► GWSs that use chemical disinfection and serve 3,300 people or fewer must take daily grab samples or meet the continuous monitoring requirements described above for GWSs serving more than 3,300 people. ► GWSs using membrane filtration for 4-log treatment of viruses must monitor the membrane filtration process according to state-specified monitoring requirements. ► GWSs may use alternative treatment technologies (e.g., ultraviolet radiation [UV]) approved by the state. GWSs must monitor the alternative treatment according to state-specified monitoring requirements, and must operate the alternative treatment according to compliance requirements established by the state.
Triggered Source Water Monitoring	► GWSs that do not conduct compliance monitoring and are notified of a total coliform-positive routine sample collected in compliance with the TCR (40 CFR 141.21) must conduct triggered source water monitoring. ► GWSs must collect at least one ground water source sample from each source in use at the time the total coliform-positive sample was collected. The triggered source water sample must be analyzed for the presence of a fecal indicator as specified in the rule. ► If the triggered source water sample is fecal indicator-positive, the GWS must either take corrective action, as directed by the state, or if corrective action is not required by the state and the sample is not invalided by the state, the GWS must conduct additional source water sampling. ► States may waive the triggered source water monitoring requirement if the state determines and documents, in writing, that the total coliform-positive routine sample is the result of a documented distribution system deficiency. ► States may develop criteria for distribution system conditions that cause total coliform positive samples. A GWS can document to the state that it met the state criteria within 30 days of the total coliform-positive sample and be exempt from collecting triggered source water sample(s). ► States may invalidate a fecal indicator-positive ground water source sample under specific conditions. If a fecal indicator-positive source sample is invalidated, the GWS must collect another source water sample within 24 hours of being notified by the state of its invalidation decision.
Additional Source Water Sampling	► If the state does not require corrective action in response to a fecal indicator-positive triggered source water sample, the GWS must collect five additional source water samples (from the same source), using the same indicator as used in triggered source water monitoring, within 24 hours of being notified of the fecal indicator-positive sample.
Assessment Source Water Monitoring	► States have the opportunity to target higher risk GWSs for additional testing. States independently can determine on a case by case basis whether monitoring is necessary and when corrective action needs to be taken.
GWSs with Significant Deficiencies or Source Water Fecal Contamination	► GWSs must take corrective action if a significant deficiency is identified, or if the initial source sample (if required by the state) or one of the five additional ground water source samples tests positive for fecal contamination. The GWS must implement at least one of the following corrective actions: ► Correct all significant deficiencies. ► Provide an alternate source of water. ► Eliminate the source of contamination. ► Provide treatment that reliably achieves at least 4-log treatment of viruses (using inactivation, removal, or a state-approved combination of 4-log virus inactivation and removal) before or at the first customer for the ground water source.
New Ground Water Sources	► New sources which come on line after November 30, 2009 are required either to conduct triggered source water monitoring as required by the GWR, or provide at least 4-log inactivation, removal or a state-approved combination of these technologies and conduct compliance monitoring within 30 days of the source being put in service.
All Ground Water Systems	► States are required to conduct sanitary surveys of all GWSs in order to identify significant deficiencies, including deficiencies which may make a system susceptible to microbial contamination. ► Following the initial sanitary survey, states must conduct sanitary surveys every 3 years for most CWSs and every 5 years for NCWSs and CWSs that provide at least 4-log treatment of viruses or have outstanding performance records, as determined by the state.

For additional information on the GWR

Call the Safe Drinking Water Hotline at 1-800-426-4791; visit the EPA web site at www.epa.gov/safewater/disinfection/gwr; or contact your state drinking water representative.

United States Environmental Protection Agency

Ground Water Rule Triggered and Representative Monitoring: A Quick Reference Guide

Overview of the Rule

Title	Ground Water Rule (GWR) 71 FR 65574, November 8, 2006, Vol. 71, No. 216 Correction 71 FR 67427, November 21, 2006, Vol. 71, No. 224
Purpose	Reduce the risk of illness caused by microbial contamination in public ground water systems (GWSs).
General Description	The GWR establishes a risk-targeted approach to identify GWSs susceptible to fecal contamination and requires corrective action to correct significant deficiencies and source water fecal contamination in all public GWSs.
Utilities Covered	The GWR applies to all public water systems (PWSs) that use ground water, including consecutive systems, except that it does not apply to PWSs that combine all of their ground water with surface water or with ground water under the direct influence of surface water prior to treatment.

Purpose of Triggered Source Water Monitoring

- The purpose of triggered source water monitoring is to evaluate whether the presence of total coliform in the distribution system is due to fecal contamination in the ground water source.
- This type of source water monitoring is triggered by routine total coliform monitoring required by the Total Coliform Rule (TCR) (40 CFR 141.21).
  - Since TCR monitoring is conducted regularly, triggered source water monitoring can occur at any time and thus provides an ongoing evaluation of ground water sources.

Triggered Source Water Monitoring Requirements

Systems Required to Conduct Triggered Source Water Monitoring

GWSs are subject to triggered source water monitoring if they:	▶ Do not provide, and conduct compliance monitoring for, at least 4-log treatment of viruses (through inactivation and/or removal). ■ This includes systems that decide to discontinue 4-log treatment. ▶ Do not purchase 100% of their water (and therefore have a source at which to sample).

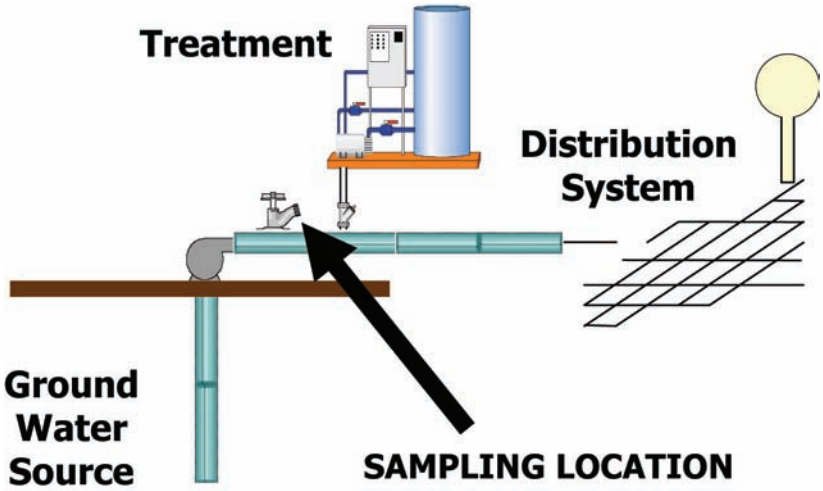
Situations Leading to Triggered Source Water Monitoring

GWSs must conduct triggered source water monitoring when:	▶ The system is notified of a total coliform-positive sample collected in compliance with the TCR unless: ■ The total coliform sample is invalidated by the State. ■ The State allows an exception to the GWR triggered source water monitoring requirements. OR ▶ The system is a wholesale system and is notified by one of its consecutive systems that the consecutive system had a total coliform-positive sample during TCR monitoring.

Collecting and Analyzing Triggered Source Water Monitoring Samples

When triggered source water monitoring is required, GWSs must:	▶ Collect at least one ground water source sample from each source in use at the time the total coliform-positive sample was collected. ■ Samples must be collected within 24 hours of being notified of the total coliform-positive sample (unless the 24-hour limit is extended by the State). ■ Sample must be taken before treatment or at a State-approved location after treatment (see the diagram on the next page). ▶ Ensure all samples are analyzed for the presence of a fecal indicator (e.g., *E. coli*, enterococci, or coliphage) using an approved GWR method. ▶ If a fecal indicator-positive source sample is invalidated by the State, the GWS must collect another source water sample within 24 hours of being notified by the State of the sample invalidation using an approved method. See the "Analytical Methods Approved for the Ground Water Rule" at http://www.epa.gov/safewater/methods/analyticalmethods.html.

- The diagram below represents an appropriate sampling location for triggered source water monitoring. GWSs should have a sample tap at each source that enables triggered source water monitoring.



Additional Sampling

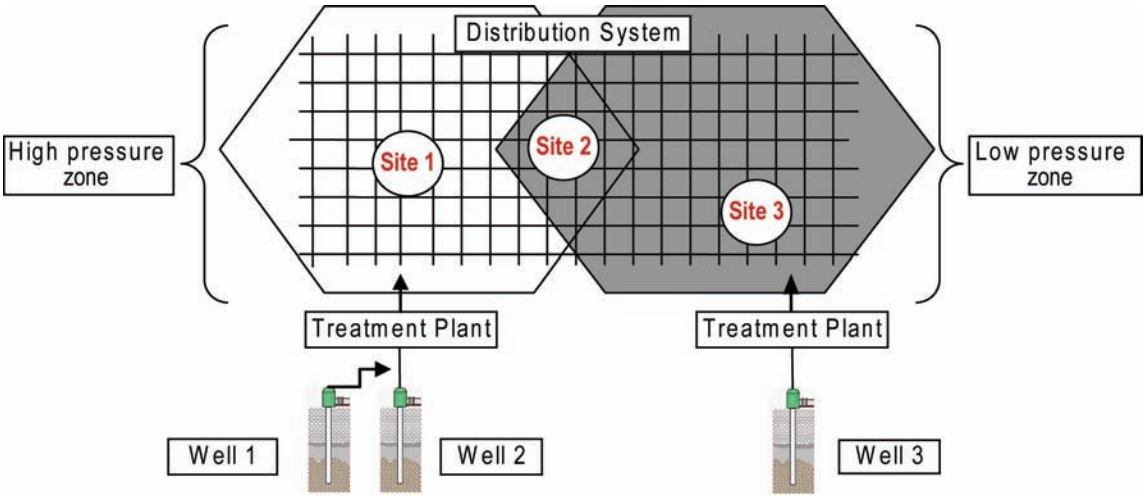
- If the initial triggered source water sample is fecal indicator-positive, and the State does not require corrective action in response, GWSs must conduct additional source water monitoring.
  - GWSs must collect five additional source water samples (from the source(s) that contained the original fecal indicator-positive samples) within 24 hours of being notified of the fecal indicator-positive sample.
  - The additional samples must be tested for a fecal indicator using an approved GWR method.
- If any one of the five additional samples is fecal indicator-positive, the system must take corrective action.
- If any additional sample is found to be fecal indicator-positive but is subsequently invalidated by the State, the GWS must resample for the same fecal indicator within 24 hours of being notified of the invalidation.

Note: If the GWS is a wholesale system, it must notify all consecutive systems served by a source of any fecal indicator-positive samples from that source within 24 hours of being notified of the sample result.

- If a GWS has multiple sources, the State may allow the GWS to conduct representative source sampling.
- Representative source water sampling allows systems to collect samples from the sources that represent (serve) the TCR monitoring site rather than from all sources. These representative ground water sources must be approved by the State.
- Systems must still:
  - Sample within 24 hours of total coliform-positive sample.
  - Analyze using an approved GWR method.

- If the State allows representative site sampling, the State may require the GWS to submit a triggered source water monitoring plan for approval <u>before</u> the GWS starts conducting representative source sampling.
  - A triggered source water monitoring plan may include:
    - A map of the water system (including location of ground water sources, location of pressure zones, and location of storage facilities),
    - A written explanation of how the GWS knows which source feeds which section of the distribution system, and
    - Seasonal or intermittent ground water sources and when they are used.
  - Regardless of whether or not the State requires a plan to be submitted, all representative source sampling locations must be approved by the State.

- The diagram below provides an example of a system schematic that could be used to determine representative sources and develop a triggered source water monitoring plan, based on where in the distribution system the total coliform-positive sample is found. If approved by the State, the system could sample sources 1 and 2 after a total coliform-positive at Site 1 since Site 1 is in the zone served by those sources. A total coliform-positive at Site 2 would require source sampling from all sources since this area is served by all sources.



Variations in Requirements Based on System Size

GWSs Serving Fewer than 1,000 Persons

- GWSs that serve fewer than 1,000 persons may be able to meet TCR repeat monitoring requirements and GWR triggered source water monitoring requirements together if the State allows:
  - Repeat TCR monitoring at the source
    AND
  - *E. coli* to be used as a fecal indicator under the GWR.
- If the State allows this situation, then the GWS can use a TCR repeat sample collected at the source to meet the triggered source water monitoring requirement of the GWR. The fourth TCR repeat sample is collected at the source. Upstream and downstream samples and a sample at the TCR site are still needed to meet TCR requirements.
- Labs must use an approved GWR method to test for *E. coli.*

Note: If the TCR repeat sample collected at the source is TCR-positive but *E. coli* is not found, the GWR does not require further action but the system is in violation of the TCR MCL.

Consecutive Systems and Wholesale Systems

Consecutive Systems	► Consecutive systems that purchase 100% of their water (and therefore do not have a source from which to sample) must: ■ Notify their wholesale system within 24 hours of receiving notice of a total coliform-positive sample taken under the TCR. ■ Upon hearing from the wholesale system of a fecal indicator-positive source water sample (either initial triggered samples or additional samples), notify the public within 24 hours. ► Consecutive systems that purchase only some of their water must: ■ Notify their wholesale system within 24 hours of receiving notice of a total coliform-positive sample taken under the TCR. ■ Collect GWR triggered source water monitoring samples and additional samples as required. ■ Upon receipt of notification from the laboratory about a fecal indicator-positive source water sample at the system's source(s) take corrective action, if required, and notify the public within 24 hours. ■ Upon receipt of notification from the wholesale system of a fecal indicator-positive sample (either initial triggered samples or additional samples) at the wholesale system's source(s), notify the public within 24 hours.
Wholesale Systems	► Wholesale systems that are notified by a consecutive system of a total coliform-positive sample must: ■ Within 24 hours of being notified, collect at least one ground water source sample from each source in use (unless representative sampling is allowed) when the total coliform-positive sample was collected. ■ Notify the public and ALL consecutive systems served by the source within 24 hours of learning that a source water sample is fecal-indicator positive.

Invalidation of Fecal Indicator-Positive Samples

- The State can invalidate a fecal indicator-positive triggered source water sample if:
  - The system provides the State with written notice from the laboratory that improper sample analysis occurred or
  - The State determines there is substantial evidence that the sample does not reflect source water quality.
    - The State must document in writing there is substantial evidence that the fecal indicator-positive ground water source sample is not related to source water quality.
- If any sample is found to be fecal indicator-positive and is subsequently invalidated by the State, the GWS must resample for the same indicator within 24 hours of being notified of the invalidation.

Exceptions to the Triggered Source Water Monitoring Requirements

Extension of the 24-hour collection limit

- The State may extend the 24-hour limit for collecting source water samples on a case-by-case basis if the State determines the system cannot collect the ground water source water sample within 24 hours due to circumstances beyond its control.
- In the case of an extension, the State must specify how much time the system has to collect the sample.

Total Coliform-Positive Sample Is The Result of Distribution System Conditions

- A GWS is not required to conduct triggered source water monitoring under one of the following circumstances:
  - The State determines and documents in writing that the total coliform-positive TCR sample is caused by a distribution system deficiency.
  - The GWS determines the total coliform-positive TCR sample was collected at a location that meets State criteria for distribution conditions that will cause total coliform-positive samples and notifies the State within 30 days.

Notification Requirements

If a GWS receives notice of a fecal indicator-positive source water sample collected under the GWR, the system must:	► Consult with the State within 24 hours. ► Notify the public within 24 hours. ■ Tier 1 Public Notification. ► If the system is a community GWS, they must provide Special Notice of the fecal indicator-positive sample in their CCR.
If a GWS fails to conduct required triggered or additional monitoring, the system must:	► Notify the public within 12 months. ■ Tier 3 Public Notification. ► Community GWSs may be able to use their CCR.
Wholesale and consecutive systems are subject to:	► The same notification requirements outlined above, in addition to the requirements to notify the wholesale or consecutive systems.

Critical Deadlines for Triggered Source Water Monitoring for Drinking Water Systems

November 30, 2009	New ground water sources put in place after this date must conduct triggered source water monitoring if the GWS does not provide 4-log virus treatment and conduct compliance monitoring and the GWS is notified that a sample collected for the TCR is total coliform-positive.
December 1, 2009	GWSs must conduct triggered source water monitoring if the GWS does not provide 4-log virus treatment and conduct compliance monitoring and the GWS is notified that a sample collected for the TCR is total coliform-positive.

United States Environmental Protection Agency

Ground Water Rule Compliance Monitoring: A Quick Reference Guide

Overview of the Rule

Title	Ground Water Rule (GWR) 71 FR 65574, November 8, 2006, Vol. 71, No. 216 Correction 71 FR 67427, November 21, 2006, Vol. 71, No. 224
Purpose	Reduce the risk of illness caused by microbial contamination in public ground water systems (GWSs).
General Description	The GWR establishes a risk-targeted approach to identify GWSs susceptible to fecal contamination and requires corrective action to correct significant deficiencies and address source water fecal contamination in all public GWSs.
Utilities Covered	The GWR applies to all public water systems (PWSs) that use ground water, including consecutive systems, except that it does not apply to PWSs that combine all of their ground water with surface water or with ground water under the direct influence of surface water prior to treatment.

Purpose of Compliance Monitoring

- Compliance monitoring ensures that GWSs that provide at least 4-log treatment of viruses using chemical disinfection, membrane filtration, or a State-approved alternative treatment technology are consistently and effectively achieving this level of treatment.

When is Compliance Monitoring Required?

- GWSs that provide at least 4-log treatment of viruses **as a corrective action** must conduct compliance monitoring.
- GWSs that provide at least **4-log treatment of viruses** at or before the first customer using chemical disinfection, membrane filtration, or a State-approved alternative treatment technology and do not conduct GWR triggered source water monitoring must **notify their State in writing** that they provide treatment and begin compliance monitoring.
- The compliance dates for systems that provide 4-log treatment in lieu of GWR triggered source water monitoring are as follows:
  - GWSs with **existing ground water sources** must notify the State by **December 1, 2009**, that they provide at least 4-log treatment of viruses and begin compliance monitoring.
  - GWSs with **new ground water sources** placed into service **after November 30, 2009**, must notify the State that they provide at least 4-log treatment of viruses and begin compliance monitoring within 30 days.

What are the Compliance Monitoring Requirements for Chemical Disinfection?

GWSs Serving 3,300 or Fewer

- GWSs using chemical disinfection and serving 3,300 or fewer persons must monitor for the **residual disinfectant concentration** and meet the **State specified** minimum concentration at or before the first customer.
- GWSs must monitor on a **daily** basis and collect a grab sample during the hour of peak flow or at another time specified by the State.
  - If any daily grab sample is less than the minimum disinfectant residual concentration, the system must take follow-up samples **every four hours** until the residual meets or exceeds the State-specified minimum concentration.
  - These systems also have the option to monitor **continuously**.
    - If the GWS monitors continuously, the system must meet the monitoring requirements for GWSs serving greater than 3,300 persons (see below).
- GWSs must monitor at a State-approved location.

GWSs Serving Greater than 3,300 Persons

- GWSs using chemical disinfection and serving greater than 3,300 persons that conduct compliance monitoring must monitor for the **residual disinfectant concentration** and meet the **State specified** minimum concentration at or before the first customer.
  - GWSs of this size must monitor **continuously** and record the lowest residual disinfectant concentration each day that water from the ground water source is served to the public.
- GWSs must monitor at a State-approved location.

Failure of Continuous Monitoring Equipment

- In the event of equipment failure for continuous monitoring, provisions are available for all GWSs serving greater than 3,300 persons and GWSs serving 3,300 persons or fewer who opt to monitor continuously.
  - If there is a failure in continuous monitoring equipment, the ground water system must **conduct grab sampling every four hours** until the continuous monitoring equipment is returned to service.
  - The system must resume continuous residual disinfectant monitoring **within 14 days**.

What are the Compliance Monitoring Requirements for Membrane Filtration?

- GWSs that use membrane filtration systems to achieve 4-log virus treatment to meet GWR requirements must:
  - Operate the process in accordance with State-specified compliance requirements.
  - Monitor the membrane filtration process in accordance with all State-specified monitoring requirements.
  - Verify that the integrity of the membrane is intact.
- The **frequency** and **location** of samples for systems conducting membrane filtration will be determined by the State.

What are the Compliance Monitoring Requirements for Alternative Treatment?

- GWSs that use alternative treatment systems to achieve 4-log virus treatment to meet GWR requirements must:
  - Operate the process in accordance with State-specified compliance requirements.
  - Monitor the process in accordance with State-specified monitoring requirements.

Compliance Monitoring and Validation Testing for Ultraviolet (UV) Disinfection

- GWSs using UV disinfection as an alternative technology to meet GWR requirements should:
  - Monitor for UV intensity, as measured by a UV sensor, flow rate and UV lamp status and any additional State-specified parameters.
  - Verify the calibration of UV sensors, and recalibrate in accordance with a State-approved protocol, at least monthly.
- UV reactors should undergo validation testing to determine the operating conditions under which the reactor delivers the UV dose corresponding to the virus log removal credit received. See "Ultraviolet Disinfection Guidance for the Final Long Term 2 Enhanced Surface Water Treatment Rule" (http://www.epa.gov/ogwdw/disinfection/lt2/pdfs/guide_lt2_uvguidance.pdf) for more information.

Summary

- The following table summarizes the compliance monitoring requirements for systems providing 4-log virus treatment in lieu of triggered source water monitoring or as a corrective action under the GWR.

System Type	Monitor For	Frequency	Sample Location
GWSs serving ≤ 3,300 using chemical disinfection	Residual disinfectant concentration (must meet State minimum)	Daily or continuous	State-approved location(s)
GWSs serving > 3,300 using chemical disinfection		Continuous only	
GWSs using membrane filtration	Membrane filtration process effectiveness	Consult State for specific information	
GWSs using State-approved alternative treatment	Alternative treatment effectiveness		

- If operation according to the criteria or requirements for compliance monitoring (minimum residual disinfectant concentration, membrane operating criteria or membrane integrity, alternative treatment operating criteria, etc.) is not restored **within four hours**, a GWS must **notify the State as soon as possible**.
- For all GWSs conducting compliance monitoring, failure to conduct required compliance monitoring (Sec. 141.403(b)) requires a **Tier 3 public notice**.
- If any GWS wishes to **discontinue** 4-log treatment of viruses before or at the first customer, the GWS then becomes subject to the **GWR triggered source water monitoring requirements**.
  - See "Ground Water Rule Factsheet: Monitoring Requirements" and "Ground Water Rule Triggered and Representative Monitoring: A Quick Reference Guide" for more information.

United States Environmental Protection Agency

Ground Water Rule Sample Collection and Transport: A Quick Reference Guide

Overview of the Rule

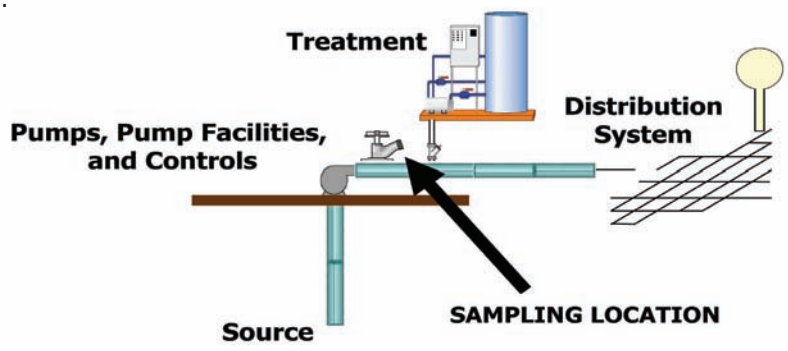
Title	Ground Water Rule (GWR) 71 FR 65574, November 8, 2006, Vol. 71, No. 216 Correction 71 FR 67427, November 21, 2006, Vol. 71, No. 224
Purpose	Reduce the risk of illness caused by microbial contamination in public ground water systems (GWSs).
General Description	The GWR establishes a risk-targeted approach to identify GWSs susceptible to fecal contamination and requires corrective action to correct significant deficiencies and address source water fecal contamination in all public GWSs.
Utilities Covered	The GWR applies to all public water systems (PWSs) that use ground water, including consecutive systems, except that it does not apply to PWSs that combine all of their ground water with surface water or with ground water under the direct influence of surface water prior to treatment.

GWR Situations Requiring Sample Collection and Transport

- The GWR requires that systems that do not provide 4-log treatment of viruses for all their ground water sources collect at least one source water sample after detection of total coliform in a routine Total Coliform Rule (TCR) (40 CFR 141.21) sample. These triggered source samples must be collected from ground water sources in use at the time of the TC positive. Samples must be collected within 24 hours unless the State allows an extension and the State will specify how long the extension is. Samples must be analyzed for the presence of one of three fecal indicators, ***E. coli***, **enterococci**, or **coliphage**. See *Ground Water Rule Triggered and Representative Monitoring: A Quick Reference Guide* (EPA 815-F-08-004) for more information.
- If a fecal indicator is found to be present in a triggered source sample and the State does not require corrective action, the GWR requires systems to collect five additional source water samples and analyze the samples for the presence of one of the three fecal indicators.
- Assessment source water monitoring may be required by the State for systems with sources that may be at risk for fecal contamination. Systems must meet State requirements for the number of samples collected and the analyses (*E. coli*, enterococci, coliphage) conducted.

Sampling Location

- For both triggered source water monitoring and assessment source water monitoring, samples must be collected at the ground water source **before treatment**, unless another location is approved by the State.
- GWSs should install a sample tap at each source to enable source water monitoring.
- The diagram below represents an appropriate sampling location for source water monitoring.



Sample Collection

Sample Containers

- Samples should be collected in sterile, plastic or glass containers with a leak-proof lid.
- The GWR requires GWSs conducting source water monitoring to analyze at least a **100-mL sample volume**.
  - However, EPA recommends that the GWS collect and ship more than 100-mL of sample to ensure that a minimum of 100 mL is available for analysis (see below).
- The sample containers should be large enough to allow at least **1-inch of headspace** to facilitate mixing of the sample by shaking prior to analysis.
- Sample volume and container size recommendations for samples of various types are provided below.

E. coli and Enterococci Samples	► **Sample volume:** At least **120 mL** of sample should be collected to ensure sufficient volume for sample analysis is available in the event of spillage at the laboratory. ► **Container Size:** The capacity of sample containers should allow at least a **1-inch headspace** to facilitate mixing of the sample by shaking prior to analysis.
Coliphage Samples	► **Sample volume:** If Method 1601 is used for coliphage sample analyses, either 100-mL or 1-L sample volumes may be analyzed (Method 1602 only accommodates 100-mL volumes). ■ While the minimum sample volume requirement for the GWR is 100 mL, systems may wish to collect and analyze a 1-L sample volume to increase the sensitivity of the Method 1601 analysis. ■ For all coliphage analyses, the GWS should collect **2.5 times** more of the sample than necessary (i.e., **250 mL** for 100 mL samples and **2.5 L** for 1 L samples) to allow for sample re-analysis, if necessary.* ► **Container size:** The capacity of sample containers should allow at least a 1-inch headspace to facilitate mixing of the sample by shaking prior to analysis. * Alternatively, samples for male-specific and somatic coliphage analyses can be collected in separate containers.

Collection Procedures

Gloves and hand washing	► When collecting samples from a ground water source, individuals should wash their hands before collecting samples and if possible wear **gloves** (latex, etc.).
Records	► All samples taken should be recorded in an on-site **sample log book** or on a **sample collection form** if it is to be sent to a laboratory for analysis. Sample log books and sample collection forms should contain the following information: ■ Name of system (e.g., Public Water System Identification number) ■ Sample site location ■ Sample type (assessment, triggered) ■ Sampler's name ■ Sample number ■ Date of sample collection ■ Time of sample collection ■ Analysis requested
Water tap and service line	► **Water taps** used for sampling should be free of aerators, bubblers, strainers, hose attachments, mixing type faucets, and purification devices. The flow of water out of the tap should be adjusted so the water will not splash out when the sample is collected. The tap should be cleaned and flushed. ► The **service line** should be cleared before sampling by maintaining a steady water flow for at least two minutes (or until the water changes temperature).
Collecting samples	► Using **aseptic technique** (i.e., sanitize tap, do not touch the inside of the sample container), the individual taking the sample should fill the sample containers, leaving at least 1-inch of headspace.
Cap and label the container	► Immediately following sample collection, the sampler should tighten the sample container lid. ► The system name, sampler's name, sample number, sample type, date and time of sample collection, sample location, and analysis requested should be recorded on the sample container. ► **IMPORTANT:** If the sample will not be shipped off-site for analysis immediately, the sample should be placed upright in a refrigerator to maintain the sample at a temperature of < 8°C prior to shipment. If a refrigerator is unavailable, the sample should be insulated in some other manner to keep it cool.

Sample Collection	
Sample Containers	
Packaging	► If the samples will be analyzed at a laboratory that is off-site, the water system should contact the laboratory as soon as possible (preferably prior to sampling) so that the laboratory can be prepared with the appropriate media. ► As soon as the sample has been collected, labeled and capped, the sample should be packaged in a shipping cooler or foam box that is used exclusively for this purpose. ■ The cooler should be double lined with plastic (i.e., with trash bags) and contain ice (wet ice in ziplock bags, gel packs, or blue ice). The GWR recommends keeping samples below **10°C**. ► The signed and dated sample collection form should be included with the sample. ► The lid of the cooler should be securely sealed and the joints of the container should be sealed with duct tape. ► If the package is being shipped, a copy of the airbill or shipping record should be kept by the ground water system. ► Packages should be sent priority overnight so that the arrangements for transport and shipping-time from collection to analysis does not exceed **30 hours** as required by the GWR.
Chain-of-Custody	► Sample collectors and laboratories should follow applicable State regulations pertaining to chain-of-custody procedures, since it is necessary to have an accurate written record to trace the possession and handling of samples from collection through reporting. ■ This procedure includes: • Field records of sample collection (sample collection form), • Label or standardized tag on the sample container(s), • Package sent to lab with chain-of-custody record form, pertinent field records, and analysis request form. ■ The procedure used by the water system and the laboratory should be documented. ■ **Every person** who takes custody of the sample should fill in the appropriate section of the chain-of-custody record. ■ See EPA's *Manual for the Certification of Laboratories Analyzing Drinking Water: Criteria and Procedures Quality Assurance (Fifth Edition)* for more information.

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United States Environmental Protection Agency
Office of Water (4606)
EPA 816-F-01-035
November 2001
www.epa.gov/safewater

Total Coliform Rule: A Quick Reference Guide

Overview of the Rule

Title	**Total Coliform Rule (TCR)** **54 FR 27544-27568, June 29, 1989, Vol. 54, No. 124[1]**
Purpose	**Improve public health protection by reducing fecal pathogens to minimal levels through control of total coliform bacteria, including fecal coliforms and *Escherichia coli (E. coli).***
General Description	**Establishes a maximum contaminant level (MCL) based on the presence or absence of total coliforms, modifies monitoring requirements including testing for fecal coliforms or *E. coli,* requires use of a sample siting plan, and also requires sanitary surveys for systems collecting fewer than five samples per month.**
Utilities Covered	**The TCR applies to all public water systems.**

Public Health Benefits

Implementation of the TCR has resulted in . . .	▸ **Reduction in risk of illness from disease causing organisms associated with sewage or animal wastes. Disease symptoms may include diarrhea, cramps, nausea, and possibly jaundice, and associated headaches and fatigue.**

What are the Major Provisions?

ROUTINE Sampling Requirements

- **Total coliform samples must be collected at sites which are representative of water quality throughout the distribution system according to a written sample siting plan subject to state review and revision.**
- **Samples must be collected at regular time intervals throughout the month except groundwater systems serving 4,900 persons or fewer may collect them on the same day.**
- **Monthly sampling requirements are based on population served (see table on next page for the minimum sampling frequency).**
- **A reduced monitoring frequency may be available for systems serving 1,000 persons or fewer and using only ground water if a sanitary survey within the past 5 years shows the system is free of sanitary defects (the frequency may be no less than 1 sample/quarter for community and 1 sample/year for non-community systems).**
- **Each total coliform-positive routine sample must be tested for the presence of fecal coliforms or *E. coli*.**
- **If any routine sample is total coliform-positive, repeat samples are required.**

REPEAT Sampling Requirements

- **Within 24 hours of learning of a total coliform-positive ROUTINE sample result, at least 3 REPEAT samples must be collected and analyzed for total coliforms:**
  - **One REPEAT sample must be collected from the same tap as the original sample.**
  - **One REPEAT sample must be collected within five service connections upstream.**
  - **One REPEAT sample must be collected within five service connections downstream.**
  - **Systems that collect 1 ROUTINE sample per month or fewer must collect a 4th REPEAT sample.**
- **If any REPEAT sample is total coliform-positive:**
  - **The system must analyze that total coliform-positive culture for fecal coliforms or *E.coli.***
  - **The system must collect another set of REPEAT samples, as before, unless the MCL has been violated and the system has notified the state.**

Additional ROUTINE Sample Requirements

- **A positive ROUTINE or REPEAT total coliform result requires a minimum of five ROUTINE samples be collected the following month the system provides water to the public unless waived by the state.**

[1] The June 1989 Rule was revised as follows: Corrections and Technical Amendments, 6/19/90 and Partial Stay of Certain Provisions (Variance Criteria) 56 FR 1556-1557, Vol 56, No 10.

Note: The TCR is currently undergoing the 6 year review process and may be subject to change.

Public Water System ROUTINE Monitoring Frequencies

Population	Minimum Samples/ Month	Population	Minimum Samples/ Month	Population	Minimum Samples/ Month
25-1,000*	1	21,501-25,000	25	450,001-600,000	210
1,001-2,500	2	25,001-33,000	30	600,001-780,000	240
2,501-3,300	3	33,001-41,000	40	780,001-970,000	270
3,301-4,100	4	41,001-50,000	50	970,001-1,230,000	300
4,101-4,900	5	50,001-59,000	60	1,230,001-1,520,000	330
4,901-5,800	6	59,001-70,000	70	1,520,001-1,850,000	360
5,801-6,700	7	70,001-83,000	80	1,850,001-2,270,000	390
6,701-7,600	8	83,001-96,000	90	2,270,001-3,020,000	420
7,601-8,500	9	96,001-130,000	100	3,020,001-3,960,000	450
8,501-12,900	10	130,001-220,000	120	[3] 3,960,001	480
12,901-17,200	15	220,001-320,000	150		
17,201-21,500	20	320,001-450,000	180		

*Includes PWSs which have at least 15 service connections, but serve <25 people.

What are the Other Provisions?

Systems collecting fewer than 5 ROUTINE samples per month . . .	Must have a sanitary survey every 5 years (or every 10 years if it is a non-community water system using protected and disinfected ground water).**
Systems using surface water or ground water under the direct influence of surface water (GWUDI) and meeting filtration avoidance criteria . . .	Must collect and have analyzed one coliform sample each day the turbidity of the source water exceeds 1 NTU. This sample must be collected from a tap near the first service connection.

** As per the IESWTR, states must conduct sanitary surveys for community surface water and GWUDI systems in this category every 3 years (unless reduced by the state based on outstanding performance).

- Compliance is based on the presence or absence of total coliforms.
- Compliance is determined each calendar month the system serves water to the public (or each calendar month that sampling occurs for systems on reduced monitoring).
- The results of ROUTINE and REPEAT samples are used to calculate compliance.

A Monthly MCL Violation is Triggered if:

A system collecting fewer than 40 samples per month . . .	Has greater than 1 ROUTINE/REPEAT sample per month which is total coliform-positive.
A system collecting at least 40 samples per month . . .	Has greater than 5.0 percent of the ROUTINE/REPEAT samples in a month total coliform-positive.

An Acute MCL Violation is Triggered if:

Any public water system . . .	Has any fecal coliform- or *E. coli*-positive REPEAT sample *or* has a fecal coliform- or *E. coli*-positive ROUTINE sample followed by a total coliform-positive REPEAT sample.

What are the Public Notification and Reporting Requirements?

For a Monthly MCL Violation	• The violation must be reported to the state no later than the end of the next business day after the system learns of the violation. • The public must be notified within 14 days.[2]
For an Acute MCL Violation	• The violation must be reported to the state no later than the end of the next business day after the system learns of the violation. • The public must be notified within 72 hours.[2]
Systems with ROUTINE or REPEAT samples that are fecal coliform- or *E. coli*-positive . . .	Must notify the state by the end of the day they are notified of the result or by the end of the next business day if the state office is already closed.

For additional information on the TCR

Call the Safe Drinking Water Hotline at 1-800-426-4791; visit the EPA web site at www.epa.gov/safewater/mdbp/mdbp.html; or contact your state drinking water representative.

[2] The revised Public Notification Rule will extend the period allowed for public notice of monthly violations to 30 days and shorten the period for acute violations to 24 hours. These revisions are effective for all systems by May 6, 2002 and are detailed in 40 CFR Subpart Q.

Appendix D

Flowcharts

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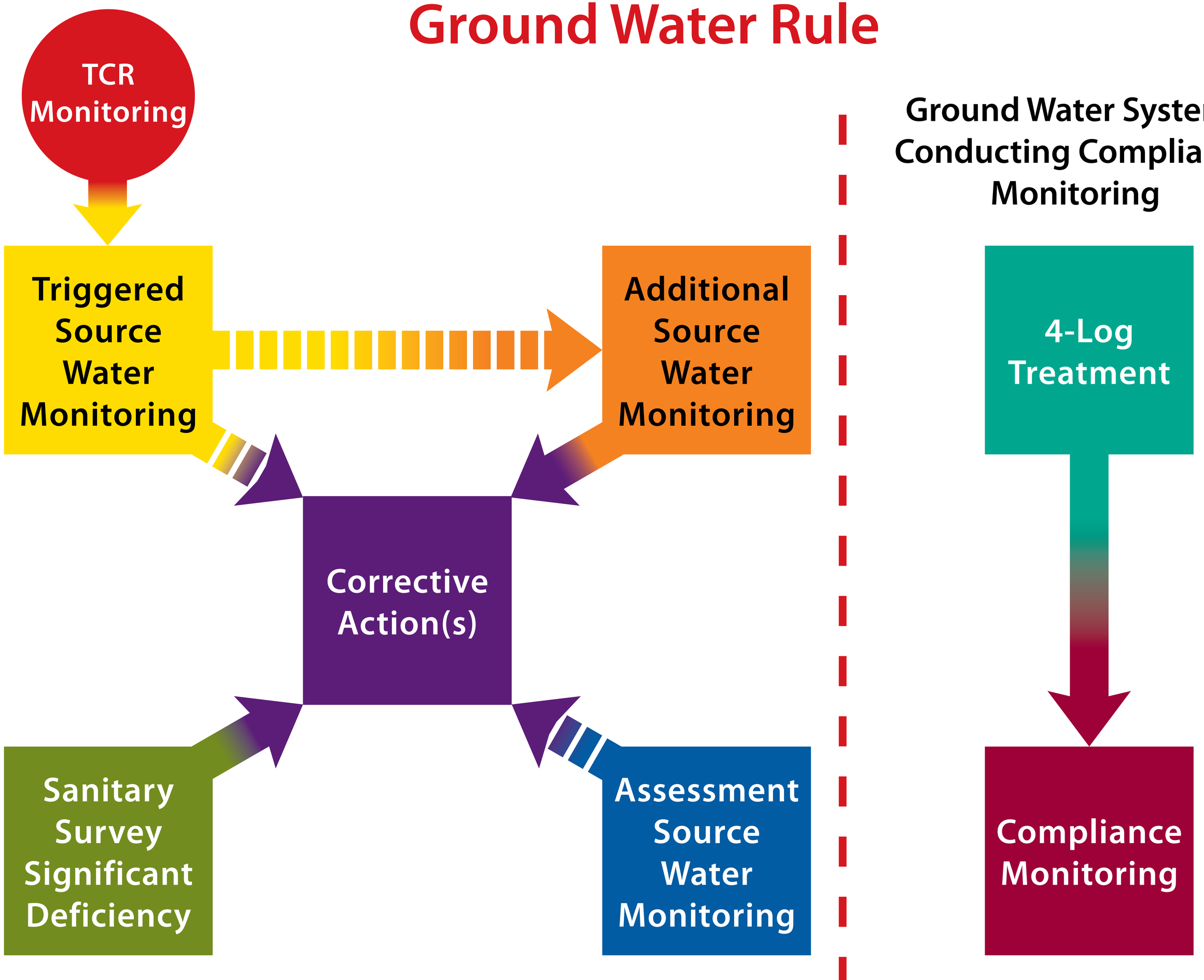
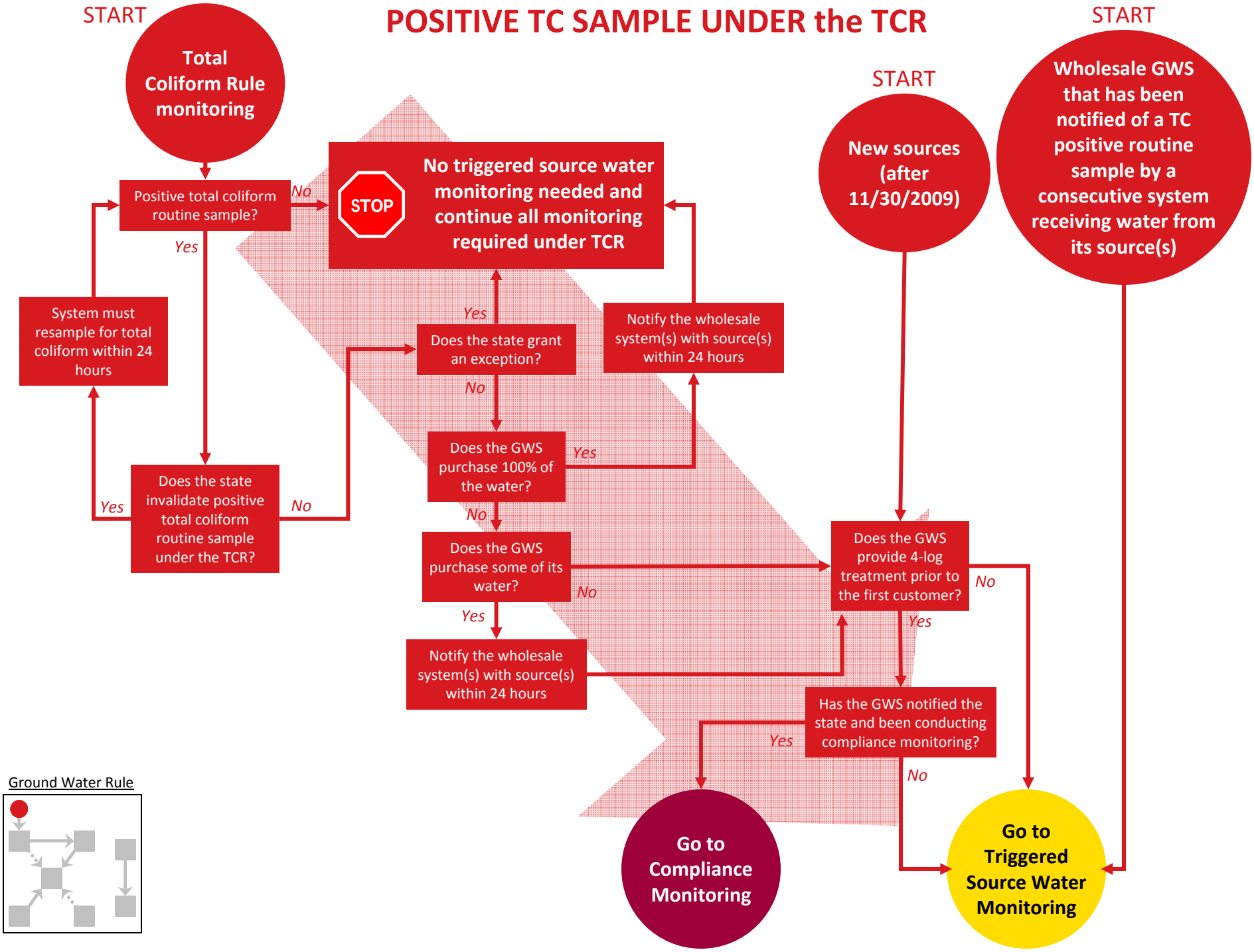
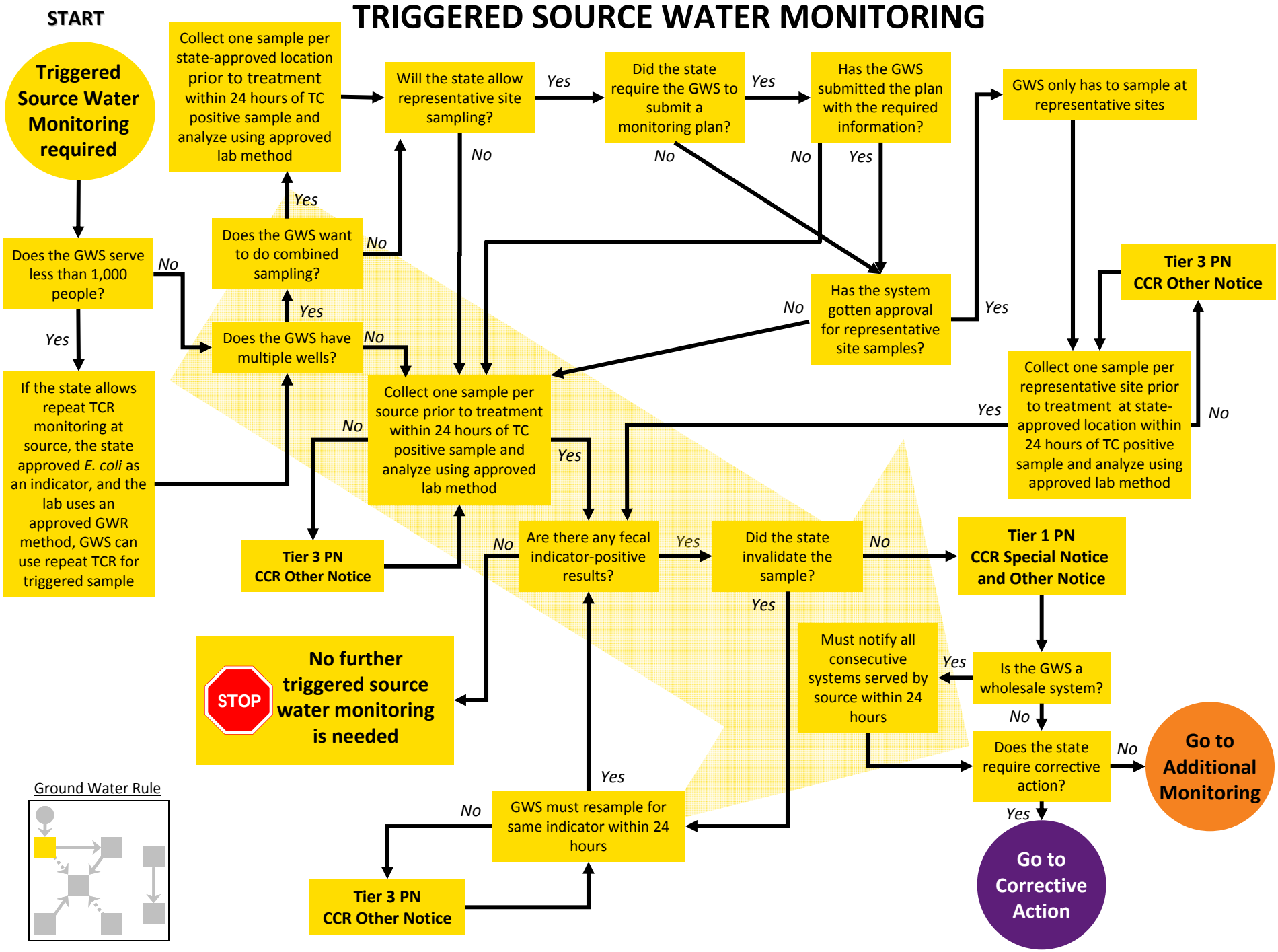
Ground Water Rule



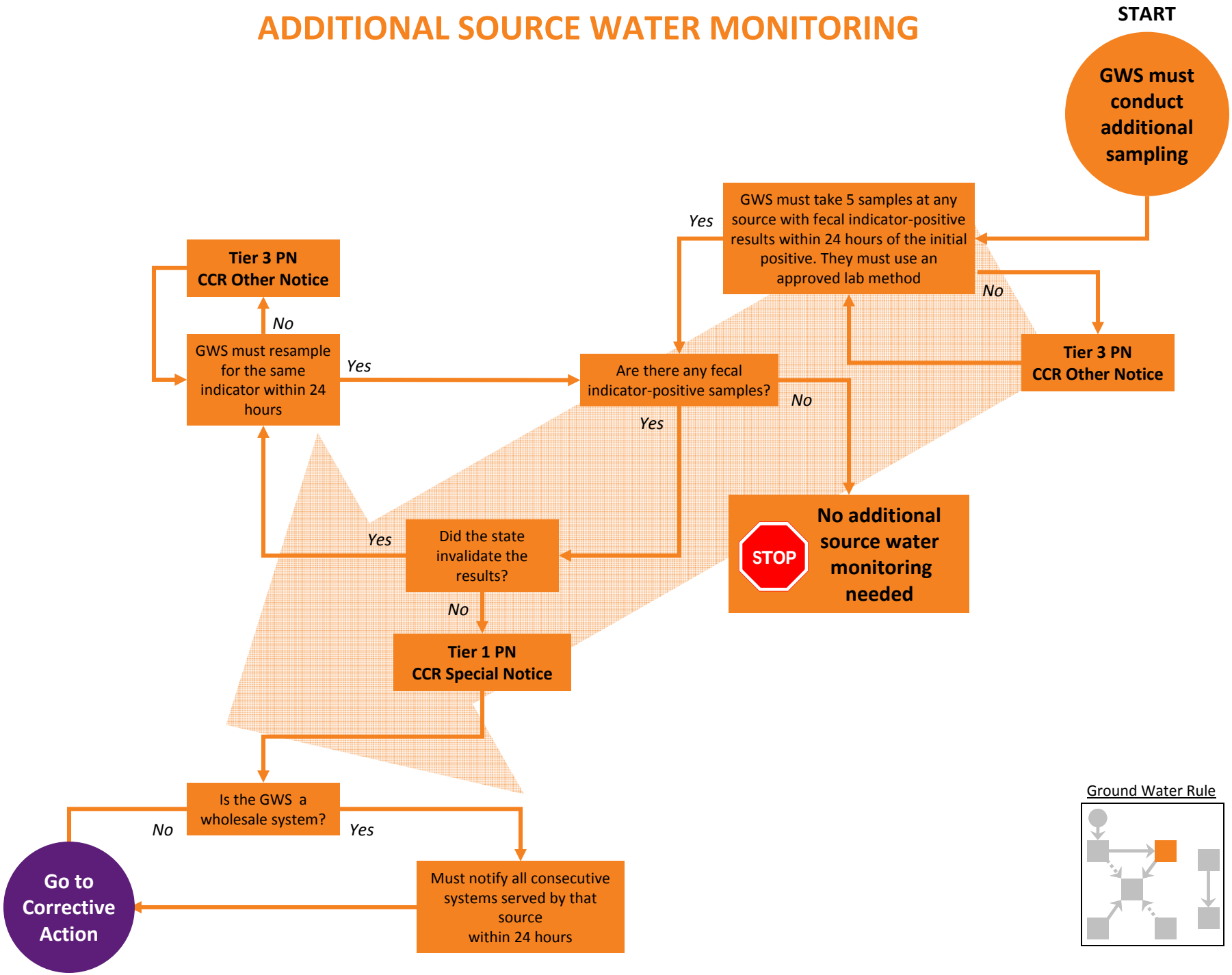
POSITIVE TC SAMPLE UNDER the TCR



TRIGGERED SOURCE WATER MONITORING

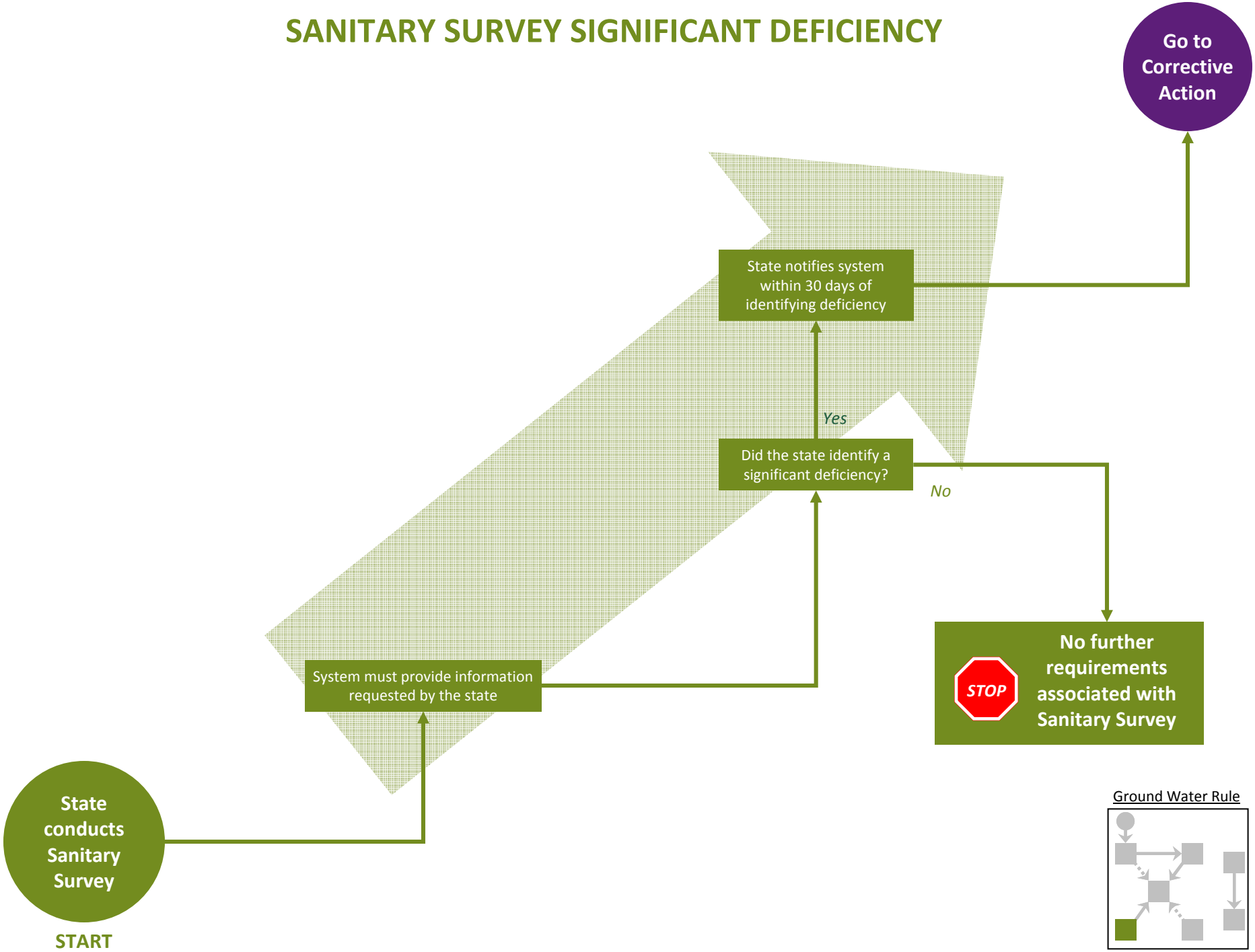


ADDITIONAL SOURCE WATER MONITORING

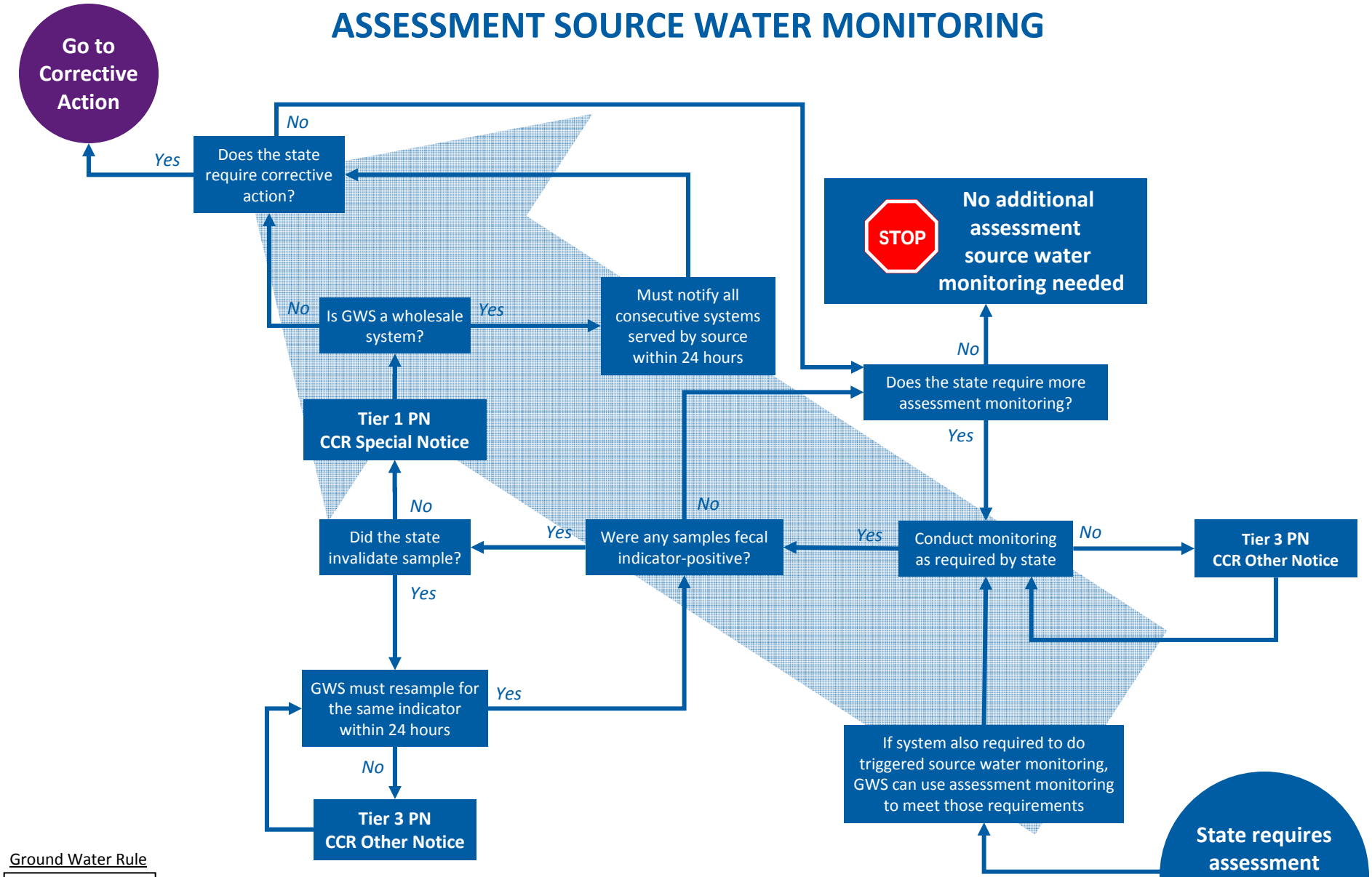


Ground Water Rule

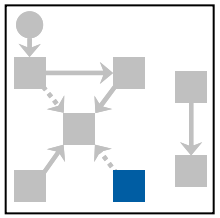
SANITARY SURVEY SIGNIFICANT DEFICIENCY



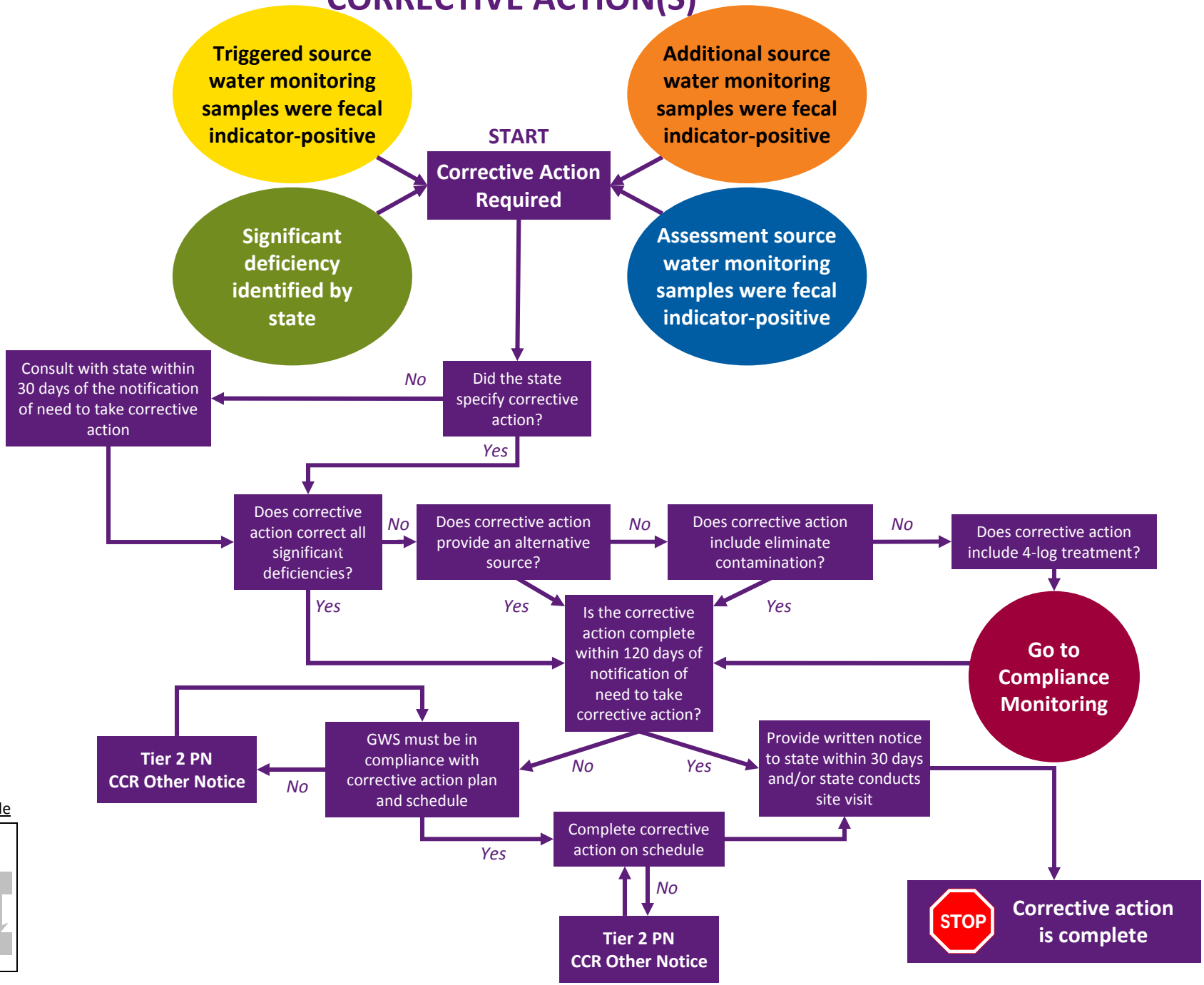
ASSESSMENT SOURCE WATER MONITORING



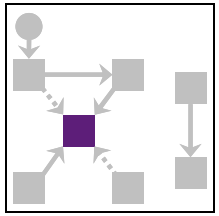
Ground Water Rule



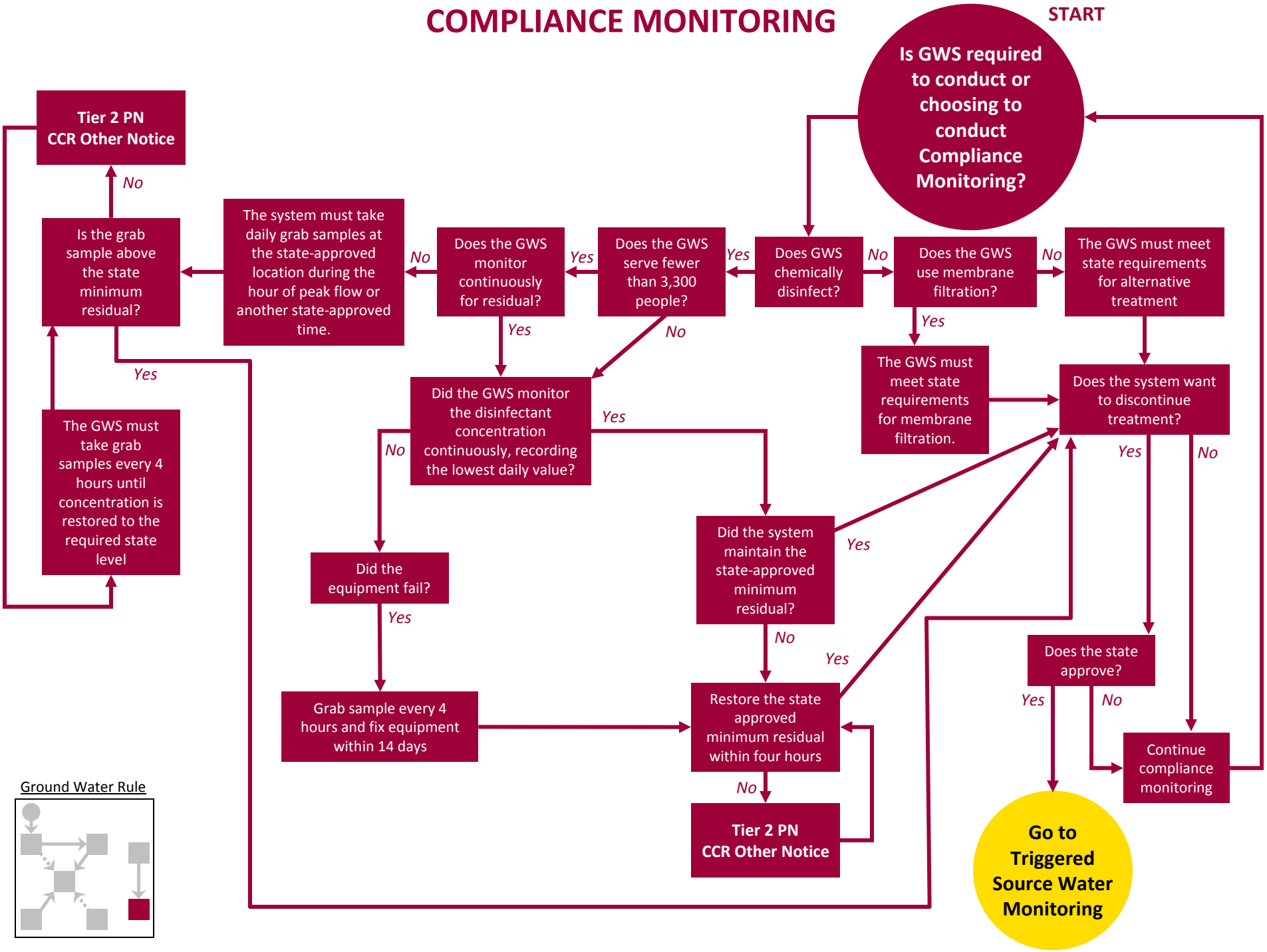
CORRECTIVE ACTION(S)



Ground Water Rule



COMPLIANCE MONITORING



Appendix E

Example Forms, Letters and Checklists

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Example System Notification Letter

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State Letterhead

John Smith, Supt.
Town Water System, PWSID XXXXXXX
Town, ST 12345

RE: Ground Water Rule

Dear Mr. Smith:

This letter is to notify you that your public water system (PWS) will be affected by the Ground Water Rule (GWR). The GWR applies to all PWSs that use ground water as their source of water and do not combine their ground water with surface water prior to treatment. The requirements of the GWR will take effect December 1, 2009. You are receiving this letter because our data show your system is a PWS that uses ground water.

Our records show that you do not treat your ground water source before the water is delivered to your customers. Our records also show that your system is a community water system serving 750 people. Please let us know if this information is not accurate and our records need to be updated.

Based on these characteristics of your water system, the GWR will affect you in the following ways:

- If your monthly routine bacteriological sample is total coliform-positive, you must collect at least one sample from each ground water source in use at the time the total coliform-positive sample was collected. This follow-up sample, referred to as a triggered source water sample, must be tested for a state-approved fecal indicator. For our state, the fecal indicator that has been approved is *E. coli*.

- If your triggered source water sample tests positive for *E. coli*, you must collect five additional samples from the source that tested positive and have them analyzed for *E. coli*.

- Since your system serves fewer than 1,000 people, you may use the triggered source water sample collected from a ground water source (as described above) to meet both the requirements of the GWR and part of the requirements for repeat sampling under the Total Coliform Rule (TCR) when you have a coliform positive-sample in the distribution system.

- In the future, your system will be receiving a sanitary survey by the state every 3 years instead of every 5 years.

- If your system has an *E. coli* positive triggered source water sample or if a significant deficiency is identified at your system and not addressed, you will be required to make special notice to the public that your source water tested *E. coli* positive or that an uncorrected significant deficiency exists at your system.

A Quick Reference Guide and Factsheets on the GWR are enclosed. The Quick Reference Guide provides more information on this regulation, and the Factsheets explain the monitoring and corrective actions in more detail. In addition to these materials, please refer to additional guidance and the state regulations

addressing the GWR requirements on the state Web site at **www.xxxxx.xx.gov**. We will be notifying you of upcoming training opportunities within the next month.

Please contact Ann Smith at this office at (555) 555-1234 if you have any questions about this letter or the GWR and its effect on your system. We appreciate your attention to this request.

Sincerely,

Enclosures: GWR Quick Reference Guide, GWR Factsheets, [list other enclosures]

Example State Correspondence and Form for GWSs to Notify State if they Provide 4-log Treatment of Viruses

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State Letterhead

Steven Smith, Director
Aquifer Water Company, PWSID XXXXXXX
Anywhere, USA

RE: Ground water treatment notification

Dear Mr. Smith:

The Ground Water Rule was published on November 8, 2006, to provide increased protection against pathogens in public water systems that use ground water sources. One requirement of the rule is that public water systems using ground water as their source must notify the state if they are currently providing 4-log treatment of viruses. This treatment can be achieved using inactivation (disinfection), removal (filtration), or a combination of inactivation and removal that has been approved by the state. If you are one of these systems, you are required to notify us by December 1, 2009.

We have included a form with this letter to help you comply with this requirement. If you have more than one ground water source, make copies of the form before filling it out and submit one completed copy for each source. Please complete a copy of the form for each ground water source your utility uses.

An explanation of what constitutes 4-log treatment of viruses is provided on the form. If you are not sure how to determine how much virus treatment your system has, call us at (555) 555-1234 and we will help you make that determination. If you understand how to make the determination but do not have the necessary information, check the box that says “We do not know if our ground water system provides 4-log treatment of viruses.” A representative from our office will call you and advise you how to proceed.

Completed forms should be mailed to us at the address provided on the form. We appreciate your prompt attention and reply.

Sincerely,

Your Regulator

PWSID Number: _____

System Name: _____

Contact Person and Phone Number: _____

Does Your System Provide 4-log Treatment of Viruses?

If your system disinfects with gaseous or liquid chlorine, use the table below to determine the CT that is provided for your ground water. The CT required will depend on your ground water source's temperature and the free chlorine residual concentration in your water at the first user. "CT" is an abbreviation for chlorine Concentration multiplied by Time.

To calculate your system's CT, multiply the free chlorine residual (in mg/L) at your first user's service connection by the shortest amount of time (in minutes) water comes into contact with the chlorine.

1. System's free chlorine residual (in mg/L) at first user's service connection: _____ X
2. Shortest amount of time (in minutes) water is coming into contact with the chlorine: _____ =
3. Multiply number and enter result: _____ Min-mg/L (Total CT)
4. System's ground water source's coldest water temperature: _____ In Degrees C

On Line A in the table below circle the value that most closely relates to the temperature recorded on line 4 above.
On Line B in the table circle the 4-log inactivation value that is associated with the temperature you circled on line A.
Compare your CT value from Line 3 above with the value you circled in Line B of the table below. If your CT is a number larger than the number you circled in Line B, then your system probably provides at least 4-log treatment of viruses.

CT Values for Inactivation of Viruses by Free Chlorine, pH 6.0-9.0

A.	Degrees C	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
B.	4-log Inactivation	11.6	10.7	9.8	8.9	8.0	7.6	7.2	6.8	6.4	6.0	5.6	5.2	4.8	4.4	4.0	3.8	3.6	3.4	3.2	3.0

CT values provided in the tables are modified by linear interpolation between 5°C increments.

If your system uses a different kind of disinfection (e.g., UV, ozone, chloramines) and/or filters its ground water, call Susan Jones at the Green County Health Department at (555) 555-1234. She will work with you to determine how many logs of virus treatment your system provides.

Check the line below that applies to your ground water system:

_____ **Our ground water system probably does not provide 4-log treatment of viruses**

_____ **Our ground water system probably provides 4-log treatment of viruses**

We do not know if our ground water system provides 4-log treatment of viruses

The following is an example calculation:

1. System's free chlorine residual (in mg/L) at first user's service connection: 0.5 mg/L X
2. Shortest amount of time (in minutes) water is coming into contact with the chlorine: 10 minutes =
3. Multiply number and enter result: (0.5 X 10) = 5 Min-mg/L (Total CT)
4. System's ground water source's coldest water temperature: 10 In Degrees C

On Line A in the table below circle the value that most closely relates to the temperature recorded on line 4 above.
On Line B in the table circle the 4-log inactivation value that is associated with the temperature you circled on line A.
Compare your CT value from Line 3 above with the value you circled in Line B of the table below. If your CT is a number larger than the number you circled in Line B then your system probably provides at least 4-log treatment of viruses.

This system does not achieve 4-log inactivation of viruses because the value from Line 3 (CT = 5) is smaller than the value circled on Line B (CT for 10°C = 6).

CT Values for Inactivation of Viruses by Free Chlorine, pH 6.0-9.0

A.	Degrees C	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
B.	4-log Inactivation	11.6	10.7	9.8	8.9	8.0	7.6	7.2	6.8	6.4	6.0	5.6	5.2	4.8	4.4	4.0	3.8	3.6	3.4	3.2	3.0

CT values provided in the tables are modified by linear interpolation between 5°C increments.

Please complete this form and mail it to

Susan Jones
Drinking Water Agency
123 Main Street
Anywhere, USA

Note: The CT values provided in this example address water with pH values between 6 and 9. Section 4.4.7.1 provides additional CT values for water with a pH of 10.

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Example Significant Deficiency Notification Letter

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State Letterhead

July 21, 2011

James King, Supervisor
and Townsville Town Board
P.O. Box 123
Townsville, ST 12345

RE: Townsville Water District – PWS No. ST1234567

Dear Supervisor King and Town Board Members:

A sanitary survey of the Townsville Water District was conducted on July 17, 2011. I was accompanied on the survey by Water Operator Mr. Alex Green, and was also provided information by Mrs. Jenkins. Their assistance is greatly appreciated. Presented here is a brief description of the system, followed by a summary of my findings from the survey. Action required by the Water District is explained below.

Water System Description: The Townsville Water District serves the central area of the town. The system has 350 service connections and serves an estimated population of 810 people. The only operational source at this time is Well #1, located in the town park. The well has two pumps, each capable of 100 gpm; the well is approved for a daily withdrawal of 150 gpm (216,000 gpd). Chlorine gas (for disinfection) and soda ash (for corrosion control) are added in the treatment building situated adjacent to the well. Most of the distribution system is PVC pipe installed in recent years. One steel storage tank holding 380,000 gallons is located at the north end of the district.

Operation and Maintenance: General operation and maintenance under the direction of Mr. Green has been very good. The system is in compliance with all monitoring and reporting requirements. Lead and copper levels in the system have been acceptable since the soda ash injection was installed.

System Deficiencies: Deficiencies found during the survey are noted below. ***The significant deficiencies must be addressed immediately. Townsville Water District should contact our office within 20 days of receiving this letter to notify us that these significant deficiencies have been addressed.*** Deadlines for addressing the other deficiencies are provided below.

- ***Significant Deficiency:*** The chlorine gas canisters are not secured (chained) in the treatment chamber. They must be chained and secured.

- ***Significant Deficiency:*** The treatment plant that houses the chlorine gas and soda ash is not locked. A lock must be installed so the public cannot enter the treatment plant.

- ***Significant Deficiency:*** Full chlorine gas canisters are stored outside the treatment building in an area that is accessible to the public. The full canisters must be stored in a secure chamber with proper sensors, ventilation, and alarm.

- Deficiency: The source water meter is not working. It should be repaired or replaced within 6 months.

- Deficiency: The cage on the ladder of the storage tank is broken. It should be repaired within 6 months.

- Deficiency: The storage tank has not been drained and cleaned in over 15 years. Customer taste and odor complaints, as well as a significant drop in the chlorine residual in water leaving the storage tank, suggest there may be silt in the tank that needs to be removed. The tank should be cleaned before the next sanitary survey (in three years).

Enclosed are forms that summarize the information and document the findings described in this report. If you have any questions about this report, or your water system in general, please contact our office.

Sincerely,

Jill Smith

Jill Smith, P.E.
Senior Sanitary Engineer

Enclosures
cc: Mr. Alex Green
Mrs. Jenkins
State Health Department Central Office

Example Monthly Operations Report for GWSs Serving More Than 3,300 People

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Public Water System Name				Reporting Month/Year	
Public Water System ID				County	Town, Village, or City
Date	**Time**	**Source(s) in use**	**Lowest free chlorine residual at entry point to distribution system (mg/l)**	**For systems using chlorine dioxide, lowest chlorine dioxide residual at entry point (mg/L)**	**Additional or Other Treatment (define here)**
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					

Public Water System Name				Reporting Month/Year	
Public Water System ID				County	Town, Village, or City
Date	**Time**	**Source(s) in use**	**Lowest free chlorine residual at entry point to distribution system (mg/l)**	**For systems using chlorine dioxide, lowest chlorine dioxide residual at entry point (mg/L)**	**Additional or Other Treatment (define here)**
31					

Did continuous monitoring equipment fail at any time this reporting month? _____ If so, were grab samples collected every four hours until the continuous monitoring equipment was returned to service? _____ Attach grab sample results and submit with this form.	Date continuous monitoring equipment failed _____ Date it was returned to service _____

Reported by: _____	Title: _____	Operator Certification Number: _____
Signature: _____	Date: _____	Operator Grade Level: _____

Example Monthly Operation Report for GWSs Serving 3,300 People or Fewer

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Public Water System Name				Reporting Month/Year	
Public Water System ID				County	Town, Village, or City
Date	**Time**	**Source(s) in use**	**Free chlorine residual at entry point to distribution system (mg/l)**	**For systems using chlorine dioxide, lowest chlorine dioxide residual at entry point (mg/L)**	**Additional or Other Treatment (define here)**
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					

Public Water System Name				Reporting Month/Year	
Public Water System ID				County	Town, Village, or City
Date	**Time**	**Source(s) in use**	**Free chlorine residual at entry point to distribution system (mg/l)**	**For systems using chlorine dioxide, lowest chlorine dioxide residual at entry point (mg/L)**	**Additional or Other Treatment (define here)**
31					
Was the chlorine residual ever less than _____ mg/L? _____					
If so, did you monitor every four hours until it returned to _____ mg/L? _____ Attach those results and submit them with this form.					
Reported by: _____		Title: _____		Operator Certification Number: _____	
Signature: _____		Date: _____		Operator Grade Level: _____	

Example Summary Monthly Report for a GWS Disinfecting with UV Radiation

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Reporting Period: _____
System/Treatment Plant: _____
PWSID: _____
Signature of Principal Executive: _____ Date: _____
Officer or Authorized Agent: _____ Date: _____

			Off-Specification Data	
Unit Number	Total Run Time (hrs)	Total Production (MG)	Number of Off-Specification Events	Total Off-Specification Volume (MG)
Total				

Compliance Certification

Total Volume of Off-Specification Water Produced (MG) [A] _____
Total Volume of Water Produced (MG) [B] _____
Total Off-Specification Water Produced (% of Volume of Water Produced) ([A]/[B]*100) _____

Facility Meets Off-Specification Requirement (< 5% of Volume on a Monthly Basis) (Y/N) _____

Of the _____ sensors, _____ have been checked for calibration and _____ were within the acceptable range of tolerance.

The Following Reactors had a Sensor Correction Factor

Reactor Number	Sensor Correction Factor

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Example Daily Operating Log for Calculated Dose Approach

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Reporting Period: _____
System/Treatment Plant: _____
PWSID: _____
UV Reactor: _____
Process Train: _____
Operator Signature: _____
Date: _____

Maximum Validated Flow Rate: _____
Minimum Validated UVT: _____
Target Log Inactivation: _____
Target Pathogen: _____
Dose Required ($D_{req'd}$): _____
Validation Factor (VF): _____

$$\text{Validated Dose} = \frac{\text{Calculated Dose}}{\text{VF} \times \text{CF}}$$

Calculated Dose =Dose that is calculated by validated PLC algorithm
VF = Validation factor
CF = UV intensity sensor correction factor.
The CF is only applied if sensors do not meet recommended criteria
(NOTE – a CF will not be needed in most cases)

Operational Data			Dose Requirements	Data at Daily Minimum Validated Dose					UV Dose Adequacy Determination	Total Off-Specification
Day	Run Time (hrs)	Total Production (MG)	$D_{req'd}$[1] (mJ/cm^2) [A]	Sensor Correction Factor[2] [B]	Calculated Dose[3] (mJ/cm^2) [C]	Daily Minimum Validated Dose[4] ([C]/[VF]/[B]) (mJ/cm^2) [D]	Flow Rate (MGD)	UVT (%)	Validated Dose > $D_{req'd}$ ([D] > [A]) (Y/N)	Total Off-Specification Volume (MG)
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
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21										
22										
23										
24										
25										
26										
27										
28										
29										
30										
31										
Min										
Max										
Total										

[1] $D_{req'd}$ is the dose required for the target log inactivation without a VF or Sensor CF applied and can be found in the UVDGM Table 1.4.
[2] Sensor CF will be 1 is no CF is used
[3] Calculated dose is calculated using the dose algorithm in the PLC.
[4] The Validated Dose is the dose based on the calculated dose that is normalized on the Validation Factor and Correction Factor
[5] Off-specification worksheet (Figure 6.5) should be used to calculate daily off-specification volume. If UVT, flowrate, and/or Validated Dose off-specification occur simultaneously, the off-specification time should only be counted once

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Example Daily Operating Log for UV Intensity Setpoint Approach

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Reporting Period: _____
System/Treatment Plant: _____
PWSID: _____
UV Reactor: _____
Process Train: _____
Operator Signature: _____
Date: _____

Maximum Validated Flow Rate: _____
Minimum Validated UVT: _____
Target Log Inactivation: _____
Target Pathogen: _____
Intensity Setpoint: _____

Operational Data						Intensity Requirements			Daily Minimum Intensity		Total Flow Off-Specification
			Flow Rate								
Day	Run Time (hrs)	Total Production (MG)	Min (mgd)	Ave (mgd)	Max (mgd)	Intensity Setpoint (W/m^2) [A]	Sensor Correction Factor[1] [B]	Adjusted Intensity Setpoint (W/m^2) ([A] * [B]) [C]	Daily Minimum Intensity (W/m^2) [D]	Minimum Daily Intensity > Adjusted Intensity Setpoint ([D] > [C]) (Y/N)	Total Flow Off-Specification[3] (MG)
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
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27											
28											
29											
30											
31											
Min											
Max											
Total											

[1] Sensor CF will be 1 is no CF is used.

[2] UVT measurements are not required but could be useful in addressing operational issues.

[3] Off-specification worksheet (Figure 6.5) should be used to calculate daily off-specification volume. If UV intensity or flowrate off-specification occur simultaneously, the off-specification time should only be counted once

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Example Extension Request Checklist

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{Date}

{Regional Administrator}
Regional Administrator
U.S. EPA Region **{Region}**
{Street Address}
{City, State, Zip}

RE: Request/approval for an Extension Agreement

Dear **{Regional Administrator}**:

The State of **{State}** is requesting an extension to the date that final primacy revisions are due to EPA for the Ground Water Rule (GWR) until **{insert date - no later than November 8, 2010}**, as allowed by 40 CFR 142.12, and would appreciate your approval. Staff of the **{State Department/Agency}** have conferred with your staff and have agreed to the requirements listed below for this extension. This extension is being requested because the State of **{State}**:

☐ Is planning to group two or more program revisions into a single legislative or regulatory action.
☐ Currently lacks the legislative or regulatory authority to enforce the new or revised requirements.
☐ Currently lacks adequate program capability to implement the new or revised requirements.

{State Department/Agency} will be working with EPA to implement the GWR within the scope of its current authority and capability, as outlined in the six areas identified in 40 CFR 142.12(b)(3)(i-vi):

i) Informing public water systems (PWSs) of the new EPA (and upcoming state) requirements and the fact that EPA will be overseeing implementation of the requirements until EPA approves the state revision.

State	EPA	
____	____	Provide copies of regulation and guidance to other state agencies, PWSs, technical assistance providers, associations, or other interested parties.
____	____	Educate and coordinate with state staff, PWSs, the public, and other water associations about the requirements of this regulation.
____	____	Notify affected systems of their requirements under the GWR.
____	____	Other:

ii) Collecting, storing, and managing laboratory results, public notices, and other compliance and operation data required by the EPA regulations.

State	EPA	
____	____	Devise a tracking system for PWS reporting pursuant to the GWR.
____	____	Keep PWSs informed of reporting requirements during development and implementation.
____	____	Report GWR violation and enforcement information to SDWIS as required.
____	____	Other:

iii) Assisting EPA in the development of the technical aspects of the enforcement actions and conducting informal follow-up and violations (telephones calls, letters, etc.).

State	EPA	
____	____	Issue notices of violation (NOVs) for treatment technique and monitoring/ reporting violations of the GWR.
____	____	Provide immediate technical assistance to PWSs with treatment technique, MCL and/or monitoring/reporting violations to try to bring them into compliance.

____ ____ Refer all violations to EPA for enforcement if they have not been resolved within 60 days of the incident that triggered the violation. Provide information as requested to conduct and complete any enforcement action referred to EPA.
____ ____ Other:

iv) Providing technical assistance to PWSs.

State EPA
____ ____ Conduct training within the state for PWSs on GWR requirements.
____ ____ Provide technical assistance through written and/or verbal correspondence with PWSs.
____ ____ Provide on-site technical assistance to PWSs as requested and needed to ensure compliance with this regulation.
____ ____ Coordinate with other technical assistance providers and organizations to provide accurate information and aid in a timely manner.
____ ____ Other:

v) Providing EPA with all information prescribed by the State Reporting Requirements in 40 CFR 142.15.

State EPA
____ ____ Report any violations incurred by PWSs for this regulation each quarter.
____ ____ Report any enforcement actions taken against PWSs for this regulation each quarter.
____ ____ Report any variances or exemptions granted for PWSs for this regulation each quarter.
____ ____ Other:

vi) For states whose request for an extension is based on a current lack of program capability to implement the new or revised requirements, taking the following steps to remedy the capability deficiency.

State EPA
____ ____ Acquire additional resources to implement these regulations (list of specific steps being taken attached as {**List A**}).
____ ____ Provide quarterly updates describing the status of acquiring additional resources.
____ ____ Other:

I affirm that the **{State Department/Agency}** will implement provisions of the GWR as outlined above.

_____
{Agency Director or Secretary} Date

_____
{Name of State Agency}

I have consulted with my staff and approve your extension for the aforementioned regulation. I affirm that EPA Region **{Region}** will implement provisions of the GWR as outlined above.

_____
Regional Administrator Date
EPA Region **{Region}**

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

State Primacy Revision Checklist

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Required Program Elements		Revision to State Program	EPA Findings/Comments
§142.10	Primary Enforcement – Definition of Public Water System*		
§142.10(a)	Regulations No Less Stringent		
§142.10(b)(1)	Maintain Inventory		
§142.10(b)(2)	Sanitary Survey Program		
§142.10(b)(3)	Laboratory Certification Program		
§142.10(b)(4)	Laboratory Capability		
§142.10(b)(5)	Plan Review Program		
§142.10(b)(6)(i)	Authority to apply regulations		
§142.10(b)(6)(ii)	Authority to sue in courts of competent jurisdiction		
§142.10(b)(6)(iii)	Right of Entry		
§142.10(b)(6)(iv)	Authority to require records		
§142.10(b)(6)(v)	Authority to require public notification		
§142.10(b)(6)(vi)	Authority to assess civil and criminal penalties		
§142.10(b)(6)(vii)	Authority to require CWSs to provide CCRs		
§142.10(c)	Maintenance of Records		
§142.10(d)	Variance/Exemption Conditions (if applicable)**		
§142.10(e)	Emergency Plans		
§142.10(f)	Administrative Penalty Authority*		
§142.10(g)	Electronic Reporting Regulations***		

* New requirement from the 1996 Amendments. Regulations published in the April 28, 1998 *Federal Register*.

** New regulations published in the August 14, 1998 *Federal Register*.

*** New regulations published in the October 13, 2005 *Federal Register*.

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Example of Attorney General's Statement

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Model Language

I hereby certify, pursuant to my authority as (1) and in accordance with the Safe Drinking Water Act as amended, and (2), that in my opinion the laws of the [State/Commonwealth of (3)] [or tribal ordinances of (4)] to carry out the program set forth in the "Program Description" submitted by the (5) have been duly adopted and are enforceable. The specific authorities provided are contained in statutes or regulations that are lawfully adopted at the time this Statement is approved and signed and will be fully effective by the time the program is approved.

I. For States with No Audit Privilege and/or Immunity Laws

Furthermore, I certify that [State/Commonwealth of (3)] has not enacted any environmental audit privilege and/or immunity laws.

II. For States with Audit Laws that do Not Apply to the State Agency Administering the Safe Drinking Water Act

Furthermore, I certify that the environmental [audit privilege and/or immunity law] of the [State/Commonwealth of (3)] does not affect the ability of (3) to meet enforcement and information gathering requirements under the Safe Drinking Water Act because the [audit privilege and/or immunity law] does not apply to the program set forth in the "Program Description." The Safe Drinking Water Act program set forth in the "Program Description" is administered by (5); the [audit privilege and/or immunity law] does not affect programs implemented by (5), thus the program set forth in the "Program Description" is unaffected by the provisions of [State/Commonwealth of (3)] [audit privilege and/or immunity law].

III. For States with Audit Privilege and/or Immunity Laws that Worked with EPA to Satisfy Requirements for Federally Authorized, Delegated, or Approved Environmental Programs

Furthermore, I certify that the environmental [audit privilege and/or immunity law] of the [State/Commonwealth of (3)] does not affect the ability of (3) to meet enforcement and information gathering requirements under the Safe Drinking Water Act because [State/Commonwealth of (3)] has enacted statutory revisions and/or issued a clarifying Attorney General's Statement to satisfy requirements for federally authorized, delegated, or approved environmental programs.

Seal of Office

_____

Signature

_____

Name and Title

_____

Date

(1) State Attorney General or attorney for the primacy agency if it has independent legal counsel.

(2) 40 CFR 142.11(a)(6)(i) for initial primacy applications or 40 CFR 142.12(c)(1)(iii) for primacy program revision applications.

(3) Name of state or commonwealth.

(4) Name of tribe.

(5) Name of primacy agency.

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