



United States
Environmental
Protection Agency

Implementation Guidance for the Arsenic Rule

Drinking Water Regulations for Arsenic and Clarifications to Compliance and New Source Contaminants Monitoring

DRAFT

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This document provides guidance to State Directors, Tribes, and U.S. Environmental Protection Agency (EPA) Regions and States exercising primary enforcement responsibility under the Safe Drinking Water Act (SDWA).

SDWA provisions and EPA regulations described in this document contain legally binding requirements. This document does not substitute for those provisions or regulations, nor is it a regulation itself. Thus, 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, and EPA will consider whether or not the recommendations or interpretations in the guidance are appropriate in that situation. EPA may change this draft guidance in the future.

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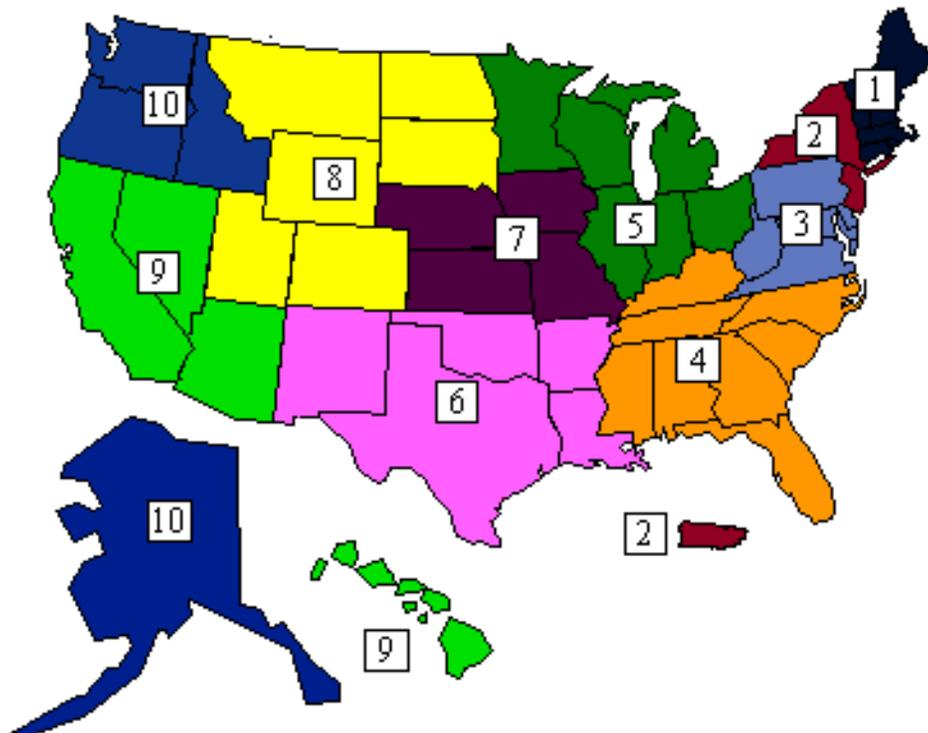
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Abbreviations and Acronyms

< – Less than

≤ – Less than or equal to

> – Greater than

≥ – Greater than or equal to

μg – Microgram, one-millionth of a gram (3.5×10^{-8} of an ounce)

μg/L – Micrograms per liter

ASTM – American Society for Testing and Materials

AWWA – American Water Works Association

BAT – Best available technology

CCR – Consumer confidence report

CFR – Code of Federal Regulations

CWS – Community water system

DWSRF – Drinking Water State Revolving Fund

EPA – U.S. Environmental Protection Agency

EPTDS – Entry point to the distribution system

FED – Federal

FR – Federal Register

ICP-AES – Inductively coupled plasma atomic emission spectroscopy

ICP-MS – Inductively coupled plasma mass spectroscopy

IOCs – Inorganic contaminants

L – Liter, also referred to as lower case “l” in older citations

MCL – Maximum contaminant level

MCLG – Maximum contaminant level goal

MDL – Method detection limit

mg – Milligrams, one-thousandth of a gram, 1 milligram = 1,000 micrograms

mg/L – Milligrams per liter

NAS – National Academy of Sciences

NDWAC – National Drinking Water Advisory Council for EPA

NIPDWR – National Interim Primary Drinking Water Regulation

NPDWR – National Primary Drinking Water Regulation

NTNCWS – Non-transient non-community water system

OECA – Office of Enforcement and Compliance Assurance

OGC – Office of General Counsel

OGWDW – Office of Ground Water and Drinking Water in EPA

ORC – Office of Regional Counsel

pH – Negative logarithm of hydrogen ion concentration

PN – Public notification

POE – Point-of-entry

POU – Point-of-use

ppb – Parts per billion

PWS – Public water system

PWSS – Public Water Systems Supervision
SAB – Science Advisory Board
SBREFA – Small Business Regulatory and Enforcement Flexibility Act
SDWA – Safe Drinking Water Act
SDWIS – Safe Drinking Water Information System
SM – Standard Method
SNC – Significant noncomplier
SOCs – Synthetic organic contaminants
SSCTs – Small system compliance technologies
STEP – Simple Tools for Effective Performance
U.S. – United States
VOCs – Volatile organic contaminants

Introduction

The purpose of this guidance manual is to provide assistance to United States (U.S.) Environmental Protection Agency (EPA), States,¹ and public water systems (PWSs) for the implementation of the Arsenic and Clarifications to Compliance and New Source Contaminants Monitoring Rule published in the Federal Register on January 22, 2001 (66 FR 6976). Developed through a public comment process involving EPA Regions, States, and Stakeholders, this manual is organized as follows:

- Section I summarizes the Arsenic and Clarifications to Compliance and New Source Contaminants Monitoring Rule and presents a timeline of important dates.
- Section II addresses compliance determination and associated reporting requirements, including violation tables to assist States in their compliance activities.
- Section III covers State Primacy Revision Requirements including a time frame for application review and approval. This section also contains guidance and references to help States adopt new special primacy requirements included in this Rule.
- Section IV contains a series of “stand alone” guidance materials that will help States and PWSs comply with the new requirements.

The Appendices of this document provide information that will be useful to States and EPA Regions in the primacy revision application process and implementation of the Arsenic Rule.

- Appendix A contains a glossary of select terms used in this document.
- Appendix B contains a copy of the Final Rule.
- Appendix C contains a copy of the delay of the effective date for the Final Rule.
- Appendix D contains EPA’s guidance on the calculation of compliance for the new arsenic MCL.
- Appendix E contains violation tables arranged for data management and enforcement purposes (under development).
- Appendix F contains the Small Entity Compliance Guide for Arsenic, which is part of the Simple Tools for Effective Performance (STEP) series (under development).
- Appendix G contains a draft Centrally Managed Point-of-Use Compliance Strategy.

¹In accordance with 40 CFR 141.2, this guidance manual uses the term “State” to include Tribal governments that have primacy and EPA Regions in situations of non-primacy.

- Appendix H contains a draft exemptions guidance for the Arsenic Rule.
- Appendix I contains the State reporting guidance for the Arsenic Rule.
- Appendix J contains a sample extension agreement between EPA and the States that will enable EPA and States and to document how they will share Rule implementation responsibilities if the State does not submit a primacy application by the deadline.
- Appendix K contains the primacy revision crosswalks for the Rule.
- Appendix L is EPA's Statement of Principles on the effect of State audit immunity/privilege laws on enforcement authority for federal programs.
- Appendix M contains training presentation materials for the Rule (under development).
- Appendix N lists references used to develop this document.

To help explain the provisions of the Arsenic Rule, this Guidance also includes a series of illustrations based on the four hypothetical systems described below. The examples that appear throughout the document (as “sidebars”) are based on these systems’ characteristics and are meant for illustrative purposes only. Since a large majority of approximately 4,000 systems that will be affected by the Arsenic Rule are small (serving 3,300 people or less) and use ground water as a source of supply, the hypothetical systems included in the illustrations are modeled on these characteristics.

System 1

System 1 is a ground water non-transient non-community water system (NTNCWS) serving 151 people that has been in operation since 1985. The system has one entry point to its distribution system (EPTDS), referred to as a sampling point.

Before January 23, 2006, a NTNCWS is not required to sample for arsenic.

The system collected its first arsenic sample at its one sampling point on January 23, 2007, to satisfy the monitoring required during the 2005 - 2007 compliance period. The sample was analyzed by EPA Method 200.8 (inductively coupled plasma mass spectroscopy (ICP-MS)) with a detection limit of 0.0014 mg/L (1.4 µg/L). The result of the sample was 0.0105 mg/L (10.5 µg/L).

System 2

System 2 is a ground water community water system (CWS) serving 3,287 people that has been in operation since 1987. System 2 collected arsenic samples at each of its three sampling points every three years and most recently in April 1999. Compliance samples taken during these years ranged from 0.015 mg/L to 0.045 mg/L (15 µg/L to 45 µg/L). All of these samples were analyzed by EPA Method 200.9 (Atomic Absorption; Platform –Stabilized Temperature) with a detection limit of 0.0005 mg/L (0.5 µg/L).

To satisfy the monitoring required during the 2002 - 2004 compliance period, the system collected samples on April, 2002. The results of the samples were:

Sampling point 1: 0.006 mg/L (6 µg/L)
 Sampling point 2: 0.027 mg/L (27 µg/L)
 Sampling point 3: 0.015 mg/L (15 µg/L)

System 3

System 3 is a ground water CWS serving 2,304 people that has been in operation since 1995. The system has collected arsenic samples at its one sampling point during the 1993-1995, 1996-1998, 1999-2001, and 2002-2004 compliance periods. The samples were analyzed by EPA Method 200.8 (ICP-MS) with a detection limit of 0.0014 mg/L (1.4 µg/L). The results of the samples ranged from “non-detect” (≤ 0.0014 mg/L, or ≤ 1.4 µg/L) to 0.004 mg/L (4 µg/L).

The system collected a sample on November 4, 2005, to satisfy the monitoring required during the 2005 - 2007 compliance period. This sample was also analyzed using EPA Method 200.8 (ICP-MS). The result of the sample was 0.003 mg/L (3 µg/L).

System 4

System 4 is a ground water CWS serving 1780 people that has been in operation since 1994. The system collected arsenic samples at both of its sampling points during the 1993-1995, 1996-1998, 1999-2001, and 2002-2004 compliance periods. All of these samples were analyzed by EPA Method 200.7 (inductively coupled plasma atomic emission spectroscopy (ICP-AES)) with a detection limit of 0.008 mg/L (8 µg/L). The results of the samples ranged from “non-detect” (≤ 0.008 mg/L, or ≤ 8 µg/L) to 0.012 mg/L (12 µg/L).

The system collected samples on March 6, 2007, to satisfy the monitoring required during the 2005-2007 compliance period. The laboratory used EPA Method 200.8 (ICP-MS) to analyze the samples for this round of monitoring because EPA withdrew approval of the less sensitive method 200.7 (ICP-AES) in the Final Arsenic Rule published January 22, 2001.

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Section I.

Rule Requirements

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I-A. Summary of Arsenic Rule

I-A.1 Introduction

I-A.1.a What is the purpose of this document?

The purpose of this guidance manual is to acquaint primacy agency decision makers, PWSs, and public health officials with the Final Arsenic Rule. The Arsenic Rule was published in the Federal Register on January 22, 2001 (66 FR 6976). The Rule is applicable to community water systems (CWSs) and non-transient non-community water systems (NTNCWSs), updates the current maximum contaminant level (MCL) for arsenic, and clarifies compliance and new source contaminant monitoring requirements. See Appendices A and B for the Final Arsenic Rule and the Final Arsenic Rule, Delay of Effective Date.

I-A.2 Background

I-A.2.a How was the arsenic standard set?

In 1942, the U.S. Public Health Service established an arsenic drinking water standard for interstate water carriers of 0.05 mg/L (50 µg/L). On December 24, 1975, under the authority of the Safe Drinking Water Act (SDWA) of 1974, EPA issued a National Interim Primary Drinking Water Regulation (NIPDWR) for arsenic of 0.05 mg/L (50 µg/L).

While scientific studies linked arsenic in drinking water to skin cancer in humans as early as 1898, the first studies reporting dose-dependent effects came from studies published in 1968 and 1977. EPA's arsenic work reflected scientific uncertainties about health effects of low concentrations of carcinogens and animal studies suggesting that arsenic may be an essential nutrient. The 1986 SDWA Amendments converted the 1975 NIPDWR to a National Primary Drinking Water Regulation (NPDWR), directed EPA to revise NPDWRs by 1989, and specified that maximum contaminant levels goals (MCLGs) be promulgated simultaneously with MCLs. As a result of a citizen suit brought after EPA missed the 1989 deadline, the Agency entered into a consent decree providing deadlines for issuing a new arsenic regulation.

The 1996 amendments to the SDWA included new statutory deadlines for the arsenic regulation, requiring EPA to propose a revised Arsenic Rule by January 1, 2000, and issue a Final Rule by January 1, 2001.

EPA published a Proposed Arsenic Rule to revise the existing NPDWR for arsenic in the Federal Register on June 22, 2000 (65 FR 38888), which proposed an MCL of 0.005 mg/L (5 µg/L). The October 2000 appropriations bill for EPA amended SDWA to direct EPA to promulgate a final arsenic standard no later than June 22, 2001. The Final Arsenic Rule, published on January 22, 2001, established the MCL at 0.01 mg/L (10 µg/L). The Rule was to become effective on March 23, 2001, 60 days after publication. The Rule established that the 0.01 mg/L (10 µg/L) MCL becomes

enforceable on January 23, 2006, and that the clarifications to compliance and new source contaminants monitoring regulations become enforceable on January 22, 2004.

Following Federal Register publication of the Arsenic Rule, the new Administration learned of concerns raised by States, PWSs, and other stakeholders regarding the adequacy of science and the basis for national cost estimates underlying the Rule. Because of the importance of the Arsenic Rule and the national debate surrounding it related to science and costs, EPA's Administrator publicly announced on March 20, 2001, that the Agency would take additional steps to reassess the scientific and cost issues associated with this Rule. After taking public comment on the Agency's plan to review the basis for the Arsenic Rule, EPA extended the effective date to February 22, 2002, while maintaining the compliance dates of January 23, 2006, for the arsenic MCL and January 22, 2004, for the clarifications to compliance and new source contaminants monitoring (66 FR 28350). EPA requested the National Academy of Sciences (NAS) to convene a panel of scientific experts to review the Agency's interpretation and application of arsenic research discussed and evaluated as part of the NAS's 1999 arsenic report, and to review and evaluate any new arsenic research that had become available since the 1999 NAS report. At the same time, EPA worked with its National Drinking Water Advisory Council (NDWAC) to review the assumptions and methodologies underlying the Agency's estimate of arsenic compliance costs. Finally, EPA asked its Science Advisory Board (SAB) to look at the benefits associated with the Rule.

The overall finding of the NDWAC was that, given the various limitations and uncertainties, EPA produced a credible estimate of the cost of compliance. The committee recommended areas where the estimate could be improved to better account for costs of equipment, labor costs, emerging technologies that may soon be available, and engineering and other secondary costs. The net result of these recommendations, EPA believes, would be a modest increase in EPA's cost of compliance estimates.

The SAB commented that many aspects of the Agency's economic analysis that supported the January 2001 Rule are commendable, and discussed areas which could be improved. The recommendations included, for example, cessation lag adjustments and quantitative benefits from non-cancer endpoints, such as diabetes. EPA believes that the net result of incorporating the SAB recommendations into a revised economic analysis would be an increase in net benefits for any of the regulatory levels considered, as compared to the benefits estimated for the January 2001 Rule.

The 2001 NAS report affirmed the use of southwestern Taiwan data and noted that new studies in Chile and Taiwan discount the effects of poor nutrition, differences in diet, smoking, and lifestyle in the quantitative risk assessments. NAS noted that study limitations in recent studies in New Hampshire and Utah prevent their use in quantifying risk in the U.S. The risks calculated in the 2001 report were higher than those in the 1999 NAS report on arsenic. The 2001 report evaluated several hundred new studies, yet could not determine what arsenic species are most toxic, nor the shape of the dose-response curve at 0.050 mg/L (50 µg/L) or less. Therefore, NAS recommended that EPA assume effects are linear to zero. EPA believes that, overall, recommendations in the NAS report would increase the risks EPA presented in the January 2001 Rule.

On October 31, 2001, Administrator Whitman announced that the 0.01 mg/L (10 µg/L) standard for arsenic would remain. In her press statement, the Administrator reiterated that the additional study and consultation did not delay the compliance date for implementing a new standard for arsenic in 2006. “Instead it has reinforced the basis for the decision,” said Whitman. “I said in April that we would obtain the necessary scientific and cost review to ensure a standard that fully protects the health of all Americans, we did that, and we are reassured by all of the data that significant reductions are necessary. As required by SDWA, a standard of 10 ppb protects public health based on the best available science and ensures that the cost of the standard is achievable.”

I-A.3 Applicability and Compliance Dates

I-A.3.a To whom does this Rule apply?

The Arsenic Rule applies to all CWSs and NTNCWSs (40 CFR 141.62(b)).

I-A.3.b What is the effective date of the Rule?

The effective date of the Arsenic Rule is February 22, 2002, and the effective date for purposes of compliance with the new consumer confidence reporting requirements for arsenic is also February 22, 2002 (40 CFR 141.6(j)). The date for systems to begin to comply with the clarified monitoring and compliance determinations for inorganic contaminants (IOCs), volatile organic contaminants (VOCs), and synthetic organic contaminants (SOCs) is January 22, 2004 (40 CFR 141.6(k)).

I-A.3.c What is the compliance date of the revised MCL?

The compliance date for the revised arsenic MCL is January 23, 2006 (40 CFR 141.6(j)), when arsenic joins the Phase II/V standard monitoring framework. To satisfy the arsenic monitoring requirements, all surface water systems must complete monitoring for the revised arsenic MCL by December 31, 2006. All ground water systems must complete monitoring for the revised arsenic MCL by December 31, 2007 (40 CFR 141.23(c)(i)).

I-A.4 MCL and MCLG

I-A.4.a What is the revised arsenic MCL?

The Final Rule establishes an arsenic MCL of 0.01 mg/L (10 µg/L or 10 ppb) (40 CFR 141.62(b)(16)). The compliance date is January 23, 2006 (40 CFR 141.6(j)).

I-A.4.b What is the new arsenic MCLG?

The Rule also finalizes an MCLG for arsenic of 0 mg/L (40 CFR 141.51(b)).

I-A.5 Benefits of the Arsenic Rule

I-A.5.a What are the benefits of lowering the arsenic MCL?

The Arsenic Rule estimated that reducing arsenic from 0.050 mg/L (50 µg/L) to 0.01 mg/L (10 µg/L) would prevent (65 FR 38940):

- More than 19-31 cases of and 5-8 deaths from bladder cancer each year;
- More than 19-25 cases of and 16-22 deaths from lung cancer each year; and,
- A number of cases of cancerous and non-cancerous diseases, such as skin cancer and heart disease.

I-A.6 Record Keeping

I-A.6.a What records are States required to keep?

The standard record keeping requirements for States under the SDWA apply to the Arsenic Rule (40 CFR 142.14). Each State that has primary enforcement responsibility must maintain records of tests, measurements, analyses, decisions, and determinations performed on each PWS to determine compliance with applicable provisions of State primary drinking water regulations. States must keep the following records for the stated period of time:

- Certifications of compliance with the public notification (PN) requirements received from PWSs, copies of the public notices received from PWSs, and records of any State determinations establishing alternative PN requirements for three years (40 CFR 142.14(f)).
- Records pertaining to each arsenic variance and exemption determination for five years following the expiration of the variance or exemption (40 CFR 142.14(e)).
- Records of analyses including the date and place of sampling and the date and results of analyses for 12 years (40 CFR 142.14(a)(6)).
- Current inventory information for every PWS in the State for 12 years (40 CFR 142.14(c)).
- Reports of sanitary surveys for 12 years (40 CFR 142.14(d)(1)).
- Records of any State approvals for 12 years (40 CFR 142.14(d)(2)).
- Records of any arsenic enforcement actions for 12 years (40 CFR 142.14(d)(3)).

- Records of determinations of a system's vulnerability to contamination from arsenic, including the monitoring results and other data supporting the determination, the State's findings based on the supporting data, and any additional bases for such decisions. This information must be kept in perpetuity or until a more recent vulnerability assessment has been issued (40 CFR 142.14(d)(4)).
- All current monitoring requirements and the most recent monitoring frequency decision pertaining to each contaminant, including the monitoring results and other data supporting the decision, the State's findings based on the supporting data, and any additional bases for such decision. This information must be kept in perpetuity or until a more recent monitoring frequency decision has been issued (40 CFR 142.14(d)(5)).

I-A.6.b What records are systems required to keep?

The standard record keeping requirements for PWSs under the SDWA apply to the Arsenic Rule (40 CFR 141.33).

Owners and operators must keep the following records for the stated period of time:

- Records of action taken by the system to correct violations of the arsenic regulation for at least three years after the last action taken with respect to the particular violation involved (40 CFR 141.33(b)).
- Copies of arsenic public notices and certifications made to the primacy agency for at least three years after their issuance (40 CFR 141.33(e)).
- Records concerning a variance or exemption granted to the system for at least five years following the expiration of such variance or exemption (40 CFR 141.33(d)).
- Records of chemical analyses for at least 10 years. Data may be kept as laboratory reports or can be transferred to tabular summaries. The summaries should include the date, place, and time of sampling; the name of the person who collected the sample; identification of the sample as a routine distribution system sample, check sample, raw or processed water sample, or other special purpose sample; date of analysis; laboratory and person responsible for performing analysis; the analytical technology/method used; and the results of the analysis (40 CFR 141.33(a)).

I-A.7 Reporting and Public Notification

I-A.7.a What do States need to report to EPA?

The standard reporting requirements for States under the SDWA apply to the Arsenic Rule (40 CFR 142.15). States must submit, among other things, quarterly reports to EPA that detail:

- All violations committed by PWSs during the previous quarter (40 CFR 142.15(a)(1)).

- Enforcement actions taken by the State during the previous quarter to enforce State arsenic regulations (40 CFR 142.15(a)(2)).
- The variances or exemptions granted during the previous quarter. The State must provide a statement of the reasons for the granting the variance or exemption, including documentation of the need for the variance or exemption and the finding that the granting of the variance or exemption will not result in an unreasonable risk to health (40 CFR 142.15(a)(3)).

States must also submit an annual report that identifies any changes (additions or corrections) to the State's PWS inventory, and includes a summary of the status of each variance and exemption currently in effect (40 CFR 142.15(b)).

I-A.7.b How are analytical results rounded?

For the purposes of compliance determination, analytical results for arsenic will be reported to the nearest 0.001 mg/L (40 CFR 141.23(i)(4)). For purposes of rounding, the last digit should be increased by one unit if the digit dropped is 5 or greater. If the digit dropped is 4 or less, do not alter the preceding number. For example, analytical results for arsenic of 0.0105 mg/L would round off to 0.011 mg/L while a result of 0.0104 mg/L would round off to 0.010 mg/L. See Illustration 1.

I-A.7.c What do systems or laboratories need to report to the States?

The standard reporting requirements for PWS monitoring programs under the SDWA apply to the Arsenic Rule (40 CFR 141.31).

Illustration 1 - System 1 Rounding Analytical Results

System 1 collected a sample at its single sampling point on January 23, 2007, to satisfy the monitoring requirements of the Arsenic Rule. The system received the lab result of 0.0105 mg/L (10.5 µg/L) on February 15, 2007. Because the laboratory did not report the result to the State, the system must report it to the State either within 10 days from the end of the month in which it received the result from the laboratory or within 10 days from the end of the monitoring period, whichever comes first (40 CFR 141.31(a)). The system reports an analytical result of 0.0105 mg/L (10.5 µg/L) to the State on March 1, 2007.

For the purposes of compliance determination and monitoring requirements, the State rounds the result to the nearest 0.001 mg/L (1 µg/L) (40 CFR 141.23(i)(4)). In this case, the result rounds to 0.011 mg/L (11 µg/L).

Note: Although the result of the sample is above the 0.01 mg/L (10 µg/L) MCL, the system is not in violation of the MCL unless, after any required confirmation samples, the running annual average (the average of four quarterly samples) is above the MCL.

- In accordance with State regulations, the system must report results within either the first 10 days following the month in which the results are received, or the first 10 days following the end of the required monitoring period, whichever of these is shortest (40 CFR 141.31(a)).
- The water supplier is not required to report analytical results to the State in cases where a State laboratory performs the analysis and reports the results to the State office (40 CFR 141.31(c)).

- The water supplier must also report to the State within 48 hours the failure to comply with the arsenic MCL or any monitoring requirement (40 CFR 141.31(b)).
- The water system must provide copies of each arsenic public notice and a letter certifying that the system has met all the PN requirements. The copies and letter are required within 10 days of the completion of each public notice (40 CFR 141.31(d)).

I-A.7.d What are the system’s public notification requirements?

Systems must provide public notice for violations and in certain other circumstances (40 CFR Part 141, Subpart Q). The revised PN Rule (40 CFR Part 141, Subpart Q) is in effect for States and Tribes with Primacy by May 6, 2002, or the date the revised primacy becomes effective, whichever is sooner. The May 2000 PN Rule divides the public notice requirements into three tiers based on the seriousness of the violation or situation².

“Tier 1” applies to violations and situations with significant potential to have serious adverse effects on human health as a result of short-term exposure. Notice is required within 24 hours of the violation. “Tier 2” applies to other violations and situations with potential to have serious adverse effects on human health. Notice is required within 30 days. Primacy agencies may grant extensions of up to three months for the initial notice under certain conditions. “Tier 3” applies to monitoring and testing violations not included in Tier 1 and Tier 2, operation under a variance or exemption, availability of unregulated contaminant monitoring results, and exceedance of the fluoride secondary MCL. Notices for Tier 3 violations can be combined into one annual notice, including the consumer confidence report (CCR), if timing and delivery requirements can be met.

The Arsenic Rule requires CWSs and NTNCWSs to provide a Tier 2 public notice for an arsenic MCL violation and to provide a Tier 3 public notice for a violation of the arsenic monitoring and testing procedure requirements (40 CFR Part 141, Subpart Q, Appendix A). See Illustration 2.

**Illustration 2 - System 1
Public Notice**

The result of the sample taken by System 1 on January 23, 2007, was 0.011 mg/L (11 µg/L). The State required the system to take a confirmation sample since the initial result was above the 0.01 mg/L (10 µg/L) MCL. The confirmation sample result was 0.013 mg/L (13 µg/L), so the average of the initial result and confirmation sample was 0.012 mg/L (12 µg/L). The State required the system to begin quarterly monitoring in April 2007 (i.e. the quarter after taking the samples that were above the MCL).

After a year of quarterly sampling System 1 has a running annual average arsenic concentration > 0.01 mg/L (10 µg/L) at its sampling point. On January 30, 2008, System 1 publishes a public notice in the local newspaper that describes the violation, lists the date the violation occurred, and includes information about arsenic’s potential adverse health effects. The system has met its Tier 2 public notice requirements by publishing a notice within 30 days of learning of the violation, one reasonably calculated to reach persons served, and that included all required information. (40 CFR 141.203(c) and 141.205).

²For Direct Implementation programs, the revised PN Rule went into effect October 31, 2000.

After providing notice to consumers, the water system must send the primacy agency a copy of each type of public notice (e.g., newspaper, radio, mail notices, etc.) along with a letter certifying that the system has met all of the PN requirements. The system must send this information to the State within 10 days of completion of each public notice (40 CFR 141.31(d)).

I-A.7.e What are the system’s consumer confidence report requirements?

All CWSs must deliver a CCR to their customers by July 1 of each year (40 CFR 141.152(b)). The CCR provides a snapshot of water quality over the preceding year. CCRs must include water quality data, monitoring results and an explanation of their significance, and health effects language and “likely source” information for MCL and treatment technique violations (40 CFR 141.153).

SDWA §1414(c)(4)(B)(vi) allows the Administrator to require systems to include health effects language for up to three regulated contaminants even if the system has not violated the MCL. EPA believes that customers should be provided the most current understanding of the risk presented by arsenic as soon as possible. Therefore, systems are currently required to include an informational statement for any sampling points for which arsenic is detected above 0.025 mg/L (25 µg/L) and up to and including 0.5 mg/L (50 µg/L), and required to include health effects information for any sampling points exceeding the 0.05 mg/L (50 µg/L) standard (40 CFR 141.154(b) and 141.153(d)(6)).

**Illustration 3 - System 2
CCR Requirements**

System 2 collected individual arsenic compliance samples at its three sampling points every three years and most recently in April 1999. Results ranged from 0.015 mg/L to 0.045 mg/L (15 µg/L to 45 µg/L). To satisfy the monitoring required during the 2002 - 2004 compliance period, the system collected samples in April 2002. The results at the three sampling points were:

- Sampling point 1: 0.006 mg/L (6 µg/L)
- Sampling point 2: 0.027 mg/L (27 µg/L)
- Sampling point 3: 0.015 mg/L (15 µg/L)

Based on the dates and the results of sampling, System 2 must include:

| In the CCR distributed by: | Because the system: | At the sampling point(s): | The following statement is required: |
|-----------------------------------|--|----------------------------------|--|
| 7/1/03 through 7/1/05 | Detected arsenic in concentrations > 0.005 mg/L (5 µg/L) but ≤ 0.01 mg/L (10 µg/L) | Sampling point 1 | The informational statement for arsenic (40 CFR 141.154(b)). |
| 7/1/03 through 7/1/05 | Detected arsenic in concentrations > 0.01 mg/L (10 µg/L) | Sampling points 2 and 3 | The health effects language from Appendix A to Subpart O (40 CFR 141.154) ^a |

^a The system can put this health effects language into context by explaining to customers that the system is complying with existing standards.

The 2001 Arsenic Rule updates the specific health effects language for arsenic (40 CFR 141.154(f)). Systems must begin complying with the revised CCR requirements for those CCRs distributed after February 22, 2002 (40 CFR 141.6(j)). See Illustration 3. The effective date affects systems that monitored for arsenic in 2001. In addition, if the system (e.g., a ground water system) does not collect a sample in 2002 and 2003 at a sampling point, it must use the result of the 2001 sample at that sampling point for the CCRs due 2003 and 2004 and comply with the CCR requirements in the Final Arsenic Rule (40 CFR 141.153(d)(3)(i) and 141.154(b)&(f)). If the result of a 2001 sample is > 0.005 mg/L (5 µg/L) but ≤ 0.01 mg/L (10 µg/L), the system must include an informational statement in the CCRs distributed to customers in 2002, 2003, and 2004 (40 CFR 141.154(b)). If the result of a 2001 sample is > 0.01 mg/L (10 µg/L) but ≤ 0.05 mg/L (50 µg/L) the system must include the health effects statement from the Final Arsenic Rule in the CCRs distributed in 2002, 2003, and 2004 (40 CFR 141.154(f)).

See Table I-1 and Figure I-1 for more information about the CCR and PN requirements for PWSs.

Table I-1. CCR Informational Statements¹ and Health Effects Language

| CCR Due Date | Arsenic Result | The System Must Include the Following Statement(s) in the CCR | |
|--|--|---|---|
| | | Informational Statements | Health Effects Statements |
| July 1, 2002, and beyond ² | > 0.005 mg/L (5 µg/L) but ≤ 0.01 mg/L (10 µg/L) | While your drinking water meets EPA's standard for arsenic, it does contain low levels of arsenic. EPA's standard balances the current understanding of arsenic's possible health effects against the costs of removing arsenic from drinking water. EPA continues to research the health effects of low levels of arsenic which is a mineral known to cause cancer in humans at high concentrations and is linked to other health effects such as skin damage and circulatory problems (40 CFR 141.154(b)(1)). | None. |
| July 1, 2002, thru July 1, 2006 ² | > 0.01 mg/L (10 µg/L) but ≤ 0.05 mg/L (50 µg/L) ^{3,4} | None. | Some people who drink water containing arsenic in excess of the MCL over many years could experience skin damage or problems with their circulatory system, and may have an increased risk of getting cancer (40 CFR 141.154(f) and 141.153(d)(6)). |
| July 1, 2007, and every July 1 thereafter | > 0.01 mg/L (10 µg/L) (System is out of compliance with the MCL and must provide this information in its CCR.) | None. | Some people who drink water containing arsenic in excess of the MCL over many years could experience skin damage or problems with their circulatory system, and may have an increased risk of getting cancer (40 CFR 141.154(f) and 141.153(d)(6)). |

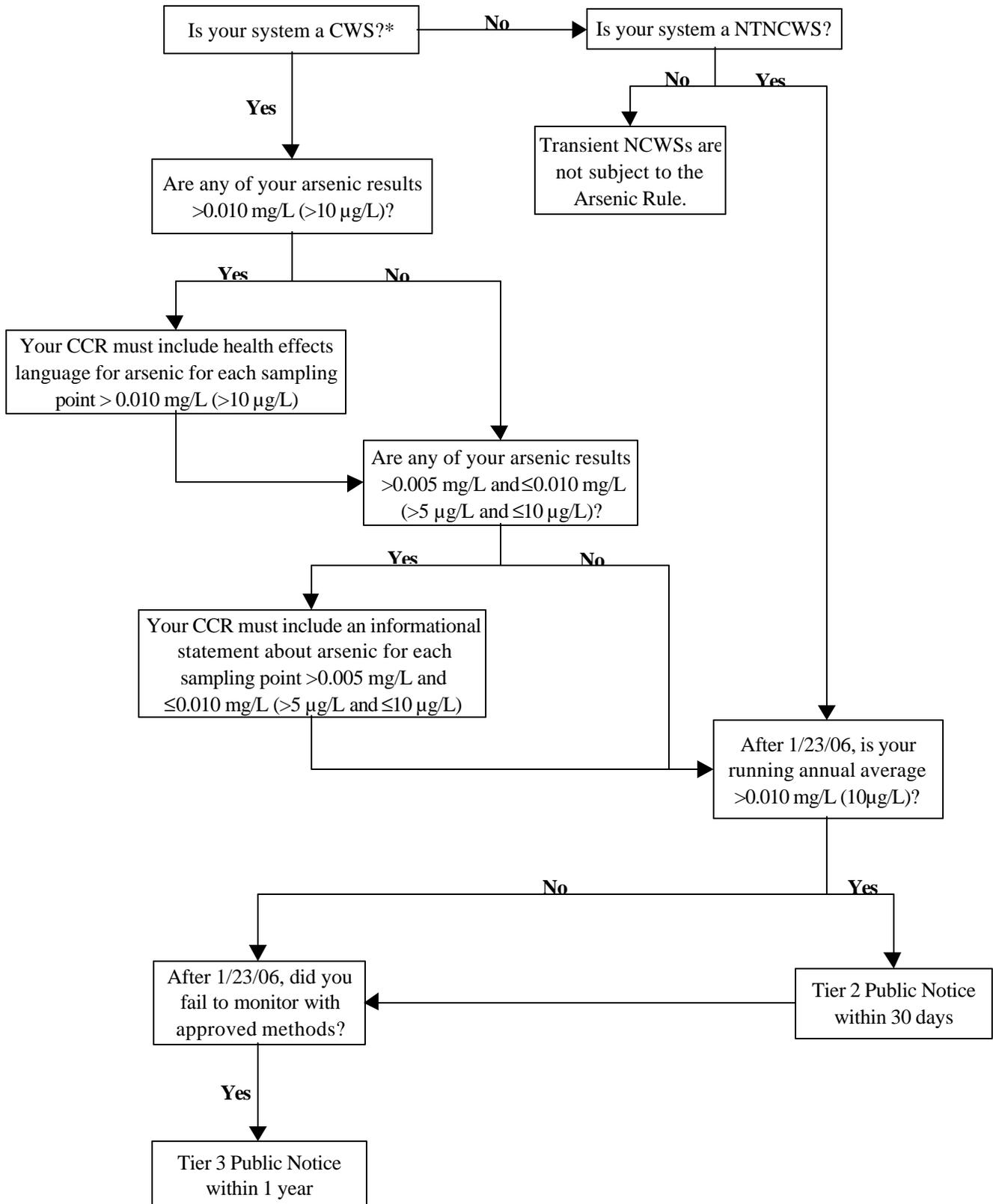
¹Systems may write their own educational statements, but only in consultation with the Primacy Agency (40 CFR 141.154(b)(2)).

²A system that collects a sample before March 23, 2001, at a sampling point and does not collect a sample in 2002 and 2003 must use the result of the 2001 sample for the CCRs due 2003 and 2004 (40 CFR 141.153(d)(3)(i)). If the result of the 2001 sample is > 0.05 mg/L (5 µg/L) but ≤ 0.01 mg/L (10 µg/L) the system must include an informational statement and if the result of the 2001 sample is > 0.01 mg/L (10 µg/L) but ≤ 0.05 mg/L (50 µg/L) the system must include the health effects statement from the Final Arsenic Rule (40 CFR 141.154(b)&(f)).

³Since the revised 0.01 mg/L (10 µg/L) MCL does not take effect until January 23, 2006, if the annual average at any sampling point is above 0.05 mg/L (50 µg/L) the system is in violation of the MCL and must include health effects language in the CCR (40 CFR 141.153(d)(6)).

⁴EPA invoked its authority under SDWA § 1414(c)(4)(B)(vi) to require inclusion of health effects language for arsenic exceedances before the February 22, 2002, effective date. Systems are required to include this health effects information even though, technically, the system is not in violation of the Arsenic Rule. Systems may put this health effects information into context by explaining to customers that the system is complying with existing standards.

Figure I-1. Public Notification and Consumer Confidence Requirements



* CCR requirements only apply to CWSs.

I-A.8 Monitoring

This section presents the monitoring requirements for arsenic under the Final Arsenic Rule.³

I-A.8.a Where do systems need to sample under the Rule?

Systems that use more than one source that are combined before distribution (e.g. an intermittent source of supply or a supply affected by seasonal demand) must sample at each entry point to the distribution system (EPTDS) during periods of normal operating conditions (i.e. when the water is representative of the water that usually enters the system) (40 CFR 141.23(a)(3)).

Systems do not have to sample at each EPTDS to satisfy the monitoring requirements if:

- The State has determined that conditions make another sampling point more representative of each source (40 CFR 142.11(a)(1) and 141.23(a)(1)).
- The State has modified the monitoring requirements of a PWS that supplies water to one or more other PWSs and the interconnection of the systems justifies treating them as a single system for monitoring purposes (i.e., consecutive PWSs) (40 CFR 141.29).

I-A.8.b What are the monitoring requirements for arsenic under the Rule?

The effective date of the Rule is February 22, 2002 (40 CFR 141.6(j)). The Rule makes the arsenic monitoring requirements consistent with monitoring for other IOCs regulated under the Phase II/V standard monitoring framework. To satisfy the monitoring requirements, all new systems or systems that use a new source that begin operation after January 22, 2004, must begin complying with the clarified compliance and new source contaminant monitoring, in accordance with a State-specified plan (40 CFR 141.23(c)(9)). The compliance date for requirements related to the revised arsenic standard is January 23, 2006. The 2005-2007 compliance period is the first monitoring period under the new MCL. Because the Final Arsenic Rule allows grandfathered data and waivers, systems should not have to deviate from their current monitoring scheme.

Ground water systems required to sample once every three years must complete sampling by December 31, 2007, and surface water systems required to sample annually must complete sampling by December 31, 2006 (40 CFR 141.23(c)(1)). The State may require more frequent monitoring or may require confirmation samples for positive or negative results (40 CFR 141.23(g)). Similarly, systems may apply to the State to conduct more frequent monitoring (40 CFR 141.23(h)). Other

³See Section I-B for information on the clarified new source and new system monitoring regulations for IOCs, VOCs, and SOCs in 40 CFR 141.23(c)(9), 141.24(f)(22), and 141.24(h)(20). For existing systems, the requirements related to the clarifications for compliance are covered in 40 CFR 141.23(i)(1)&(2), 141.24(f)(15), and 141.24(h)(11)). The effective date for all of these requirements is January 22, 2004.

exceptions may apply. See Sections I-A.9 and I-A.10 for information on grandfathered data and monitoring waivers.

In accordance with the standardized monitoring framework, if compliance monitoring samples show arsenic levels below the MCL at each sampling point, ground water systems must continue to take routine samples once every three years at each sampling point and surface water systems must take annual samples at each sampling point (40 CFR 141.23(c)(1)).

States may allow systems to collect up to five samples, which may be composited by the laboratory. The laboratory that analyzes the samples must use a method with a detection limit of 0.002 mg/L (2 µg/L; i.e. 1/5th of the MCL)⁴ (40 CFR 141.23(a)(4)). If the five composited samples are above 1/5th of the MCL, the system must take follow-up samples at each sampling point within 14 days (40 CFR 141.23(a)(4)). Compliance determinations will be based on the follow-up sample result. EPA encourages States to discontinue allowing systems to composite samples if arsenic is detected at levels greater than 1/5th the MCL.

I-A.8.c When must a system increase its monitoring frequency?

Any system that has a sampling point monitoring result which exceeds the MCL must increase the frequency of monitoring at that sampling point to quarterly sampling⁵ (40 CFR 141.23(c)(7)). Quarterly sampling must begin the quarter after the exceedance occurred and continue until the State determines that the system is reliably and consistently below the MCL⁶ (40 CFR 141.23(c)(7)&(8)). States may also set a sampling schedule as a condition to a variance, exemption, or enforcement action. States may require a system that fails to take a quarterly sample to either collect the missing sample as soon as possible, or collect the sample the following year in the quarter that was missed.

Systems triggered into increased monitoring will not be considered in violation of the MCL until they have completed one year of quarterly sampling.⁷ However, if any sample result will cause the running

⁴After January 23, 2006, analytical methods using the ICP-AES technology may not be used because the detection limits for these methods are 0.008 mg/L (8 µg/L) or higher (40 CFR 141.23(k)(1)). This restriction means that the two ICP-AES methods (EPA Method 200.7 and SM 3120 B) may not be used for compliance determinations.

⁵States have the flexibility to require confirmation samples.

⁶Reliably and consistently below the MCL means that a groundwater system has collected a minimum of two consecutive quarters of samples at the sampling point with the exceedance and a surface water system has collected four consecutive quarters of samples at the sampling point with the exceedance (40 CFR 141.23(c)(8)).

⁷The preamble to the Final Arsenic Rule (66 FR 7032) stated that “systems monitoring annually or less frequently whose sample result exceeds the MCL for any IOC in Sec. 141.23(c), or whose sample result exceeds the trigger level for any IOC listed in Sec. 141.24(f) or Sec. 141.24(h), must revert to quarterly sampling for that contaminant the next quarter.” However, an editorial oversight retained the proposed regulatory language in 141.23(i)(2) while correctly stating the quarterly monitoring for compliance for organics in 141.24(f)(15)(i) and 141.23(h)(11)(i) in the Final Arsenic Rule. EPA intends to consistently implement compliance determination. Compliance determination for IOCs is the same as for organic contaminants. See Appendix D for guidance on the

annual average to exceed the MCL at any sampling point (e.g., the sampling result is four times the MCL), the system is out of compliance with the MCL immediately.

Systems with an MCL violation must meet all PN requirements (40 CFR Part 141 Subpart Q). A detailed list of violations for data management and enforcement purposes is being drafted and will be included as Appendix E in future versions of this guidance.

I-A.9 Grandfathered Data

I-A.9.a What data may ground water systems be allowed to grandfather?

For ground water systems, the term grandfathered data refers to monitoring samples collected between January 1, 2005, the start of the first compliance period for ground water systems for the revised MCL, and January 23, 2006, the compliance date for the new MCL. Because January 23, 2006, falls in the middle of a compliance period, States may allow systems to use grandfathered data collected after January 1, 2005, to satisfy the sampling requirements for the compliance period. See Illustration 4.

States may allow systems to grandfather data under the following circumstances (40 CFR 141.23(c)(4)):

- The system collects its sample for the 2005-2007 compliance period between January 1, 2005, and January 23, 2006;
- The data are consistent with the sampling/analytical methodology approved for use by this Rule; and,
- The method detection limit is less than 0.008 mg/L (8 µg/L).

Illustration 4 - System 3 Monitoring Waiver

System 3 collected a sample on November 4, 2005, to satisfy the monitoring required during the 2005 - 2007 compliance period. The sample was analyzed by EPA Method 200.8 (ICP-MS) with a detection limit of 0.0014 mg/L (1.4 µg/L). The result of the sample was 0.003 mg/L (3 µg/L).

A State may allow System 3 to use the 2005 sampling result to satisfy the monitoring requirements since System 3 is a ground water system that sampled after January 1, 2005 and the analytical methodology has a detection limit less than 0.008 mg/L (8 µg/L).

System 3 may continue to collect one sample every three years with the next sample due between 2008 - 2010 or apply to the State for a nine year waiver. Since the method used to analyze the samples was an EPA approved method with detection limits significantly below the revised arsenic MCL of 0.01 mg/L (10 µg/L), the State may use the three rounds of monitoring (one sample from 1999 -2001, one sample from 2002 - 2004, and one sample from 2005 - 2007) to issue the nine year waiver. If the State issues a waiver, the system will now be required to collect one sample during the period from 2008 - 2016.

calculation of compliance for the new arsenic MCL. For the purpose of calculating the running annual average, the initial exceedance is considered to be the first quarterly sample. See Section II-B for more information on determining compliance.

Data collected using inductively coupled plasma atomic emission spectroscopy (ICP-AES) technology are not eligible for grandfathering because EPA has determined that these methods are not adequate to “reliably determine the presence of arsenic . . . even at . . . 0.010 mg/L . . . for compliance monitoring of arsenic in drinking water” (65 FR 38913).

Ground water systems that do not use grandfathered data must collect a sample by December 31, 2007, to demonstrate compliance with the revised MCL (40 CFR 141.23(c)(1)).

I-A.9.b What data may surface water systems be allowed to grandfather?

For surface water systems, the term grandfathered data refers to monitoring samples collected between January 1, 2006, the start of the first compliance period for surface water systems for the revised MCL, and January 23, 2006, the compliance date for the new MCL. Because January 23, 2006, falls in the middle of a compliance period, States may allow systems to use grandfathered data collected after January 1, 2006, to satisfy the sampling requirements for the compliance period.

States may allow systems to grandfather data under the following circumstances (40 CFR 141.23(c)(4)):

- The system collects its annual sample for 2006 between January 1, 2006, and January 23, 2006;
- The data are consistent with the sampling/analytical methodology approved for use by this Rule; and,
- The method detection limit is less than 0.008 mg/L (8 µg/L).

Data collected using ICP-AES technology are not eligible for grandfathering because EPA has determined that these methods are not adequate to “reliably determine the presence of arsenic . . . even at . . . 0.010 mg/L . . . for compliance monitoring of arsenic in drinking water” (65 FR 38913).

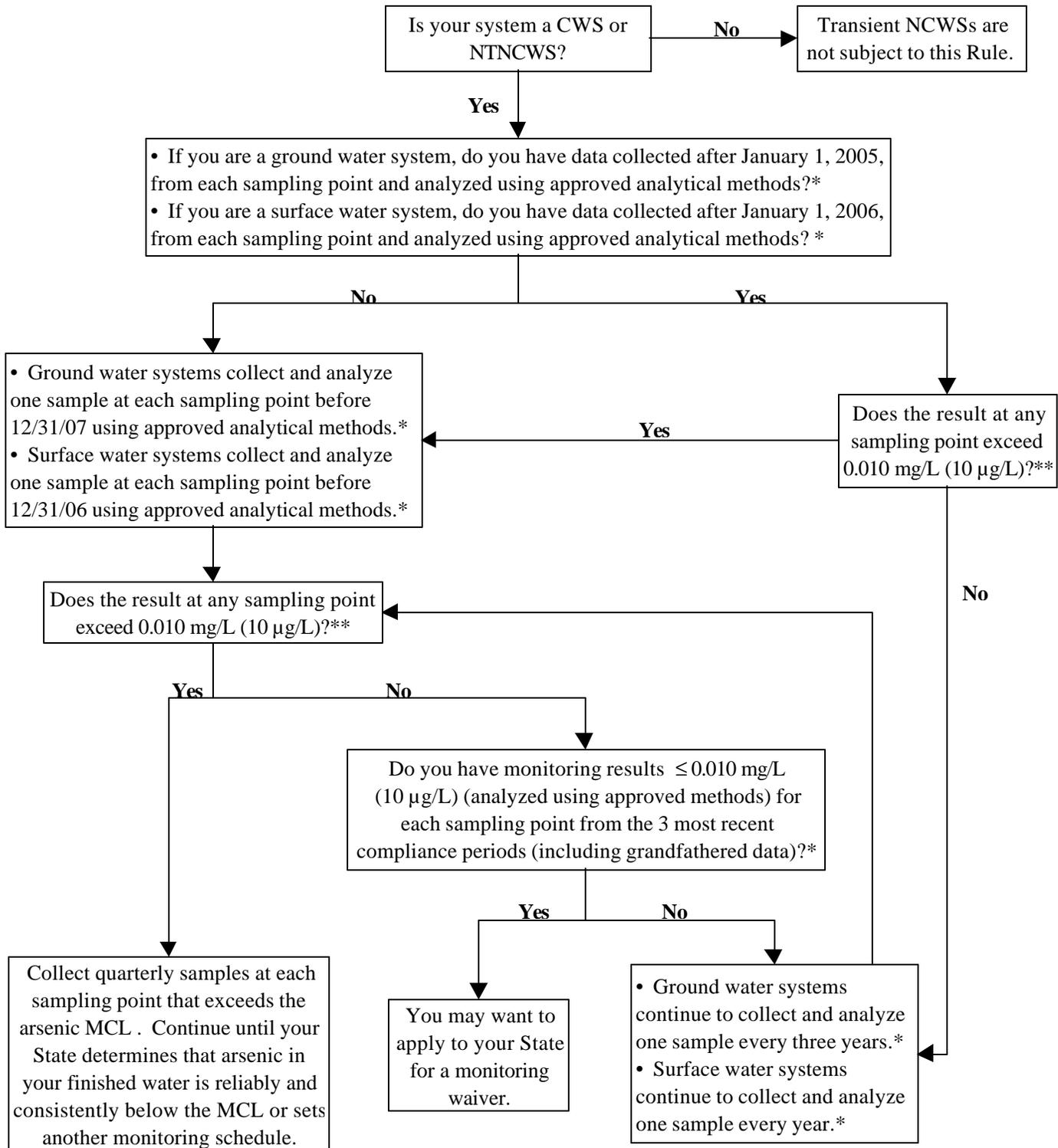
Surface water systems that do not use grandfathered data must collect a sample by December 31, 2006, to demonstrate compliance with the revised MCL (40 CFR 141.23(c)(1)).

I-A.9.c What happens if a system grandfathers data with results above the MCL?

If grandfathered data are used to comply with the compliance period and the analytical result is greater than 0.01 mg/L (10 µg/L), that system will be in violation of the revised MCL on the effective date of the Rule.

Figure I-2 depicts the arsenic monitoring and grandfathering requirements for PWSs.

Figure I-2. Arsenic Monitoring and Grandfathering Requirements for PWSs



*After January 23, 2006, analytical methods using the ICP-AES technology may not be used because the detection limits for these methods are 0.008 mg/L (8 µg/L) or higher (40 CFR 141.23(k)(1)). This restriction means that the two ICP-AES methods (EPA Method 200.7 and SM 3120B) may not be used for compliance determinations.

** If your State requires you to take any confirmation samples, then the average of the initial sample and any confirmation samples will be used to determine your future monitoring frequency.

I-A.10 Monitoring Waivers

I-A.10.a Can States issue monitoring waivers under the Arsenic Rule?

Because the Final Rule incorporates arsenic into the standard monitoring framework for IOCs, States may grant a nine-year monitoring waiver to a system. States must consider all previous monitoring data; the variation in reported concentrations; and other factors that may affect concentrations such as changes in pumping rates, system configuration, operating procedures, or stream characteristics (40 CFR 141.23(c)(5)). States should also consider the quality and amount of data available, the length of time covered, the volatility/stability of the sampling results, and the proximity of results to the MCL. Source water assessments currently being conducted by the States are another valuable tool that may assist States in determining whether to grant a waiver. In deciding whether to grant a waiver, States should use all available information.

I-A.10.b Which systems are eligible for monitoring waivers?

To qualify for an arsenic waiver, a system must have data from three previous sampling periods. This includes data collected during the following compliance periods: 1990-1992, 1993-1995, 1996-1999, 2002-2004, and 2005-2007. The analytical results from all samples must be below the MCL (0.01 mg/L or 10 µg/L), and the data must be consistent with the analytical methodology and detection limits of the Arsenic Rule (40 CFR 141.23(c)(4)).

Systems may be eligible for waivers if (40 CFR 141.23(c)(3)&(4)):

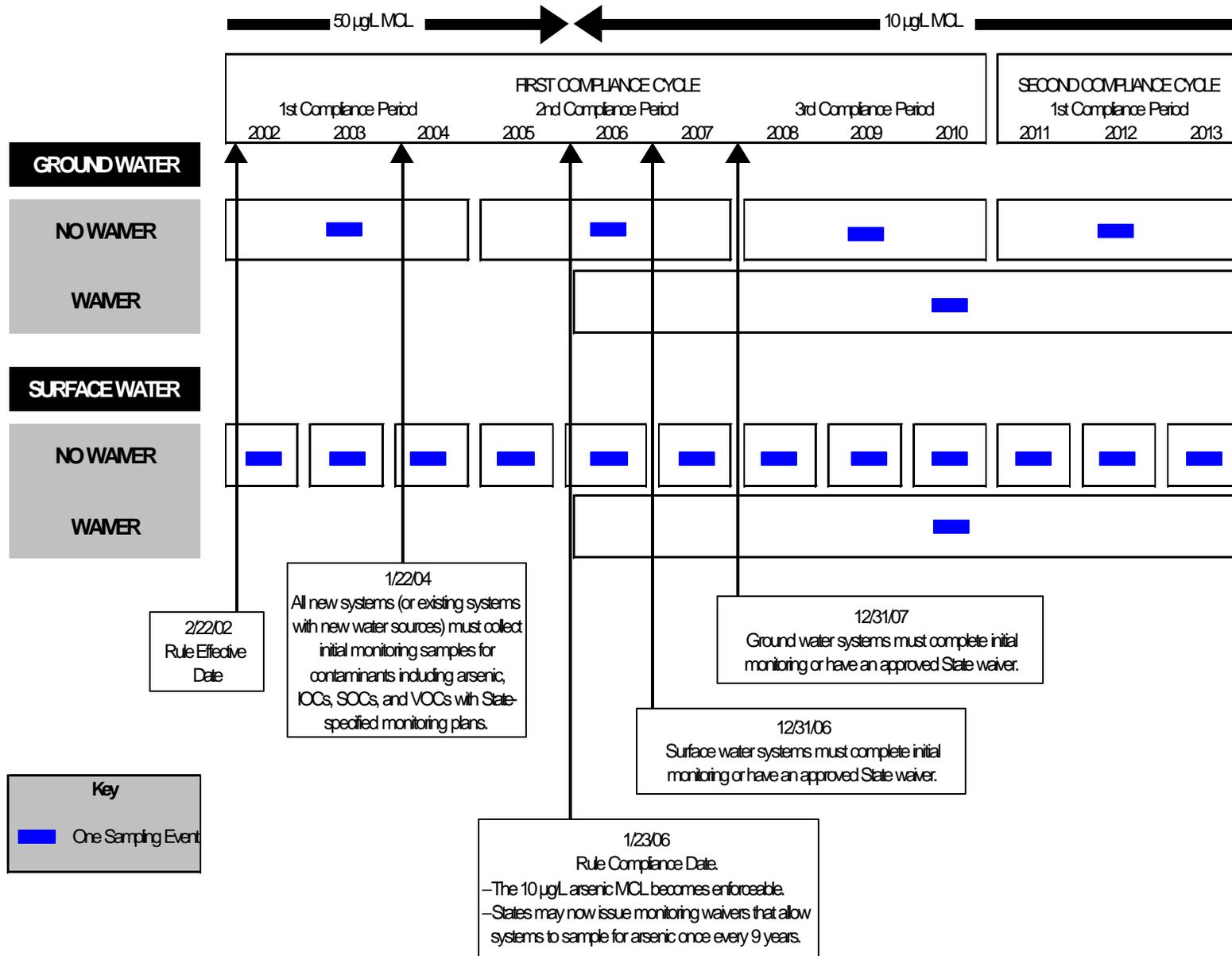
- Ground water systems have data below the MCL from three sampling periods. This includes data collected from three compliance periods between 1990 and 2007 that are consistent with the analytical methodology of the Arsenic Rule.⁸ Once a waiver is issued, the system must take at least one sample during each nine-year period.
- Surface water systems have data below the MCL from three sampling periods. This includes data collected between 1990 and 2007 that are consistent with the analytical methodology in the Arsenic Rule.⁹ Once a waiver is issued, the system must take at least one sample during each nine-year waiver period.

Figure I-3 depicts the standardized monitoring framework for IOCs as applied to arsenic.

⁸After January 23, 2006, analytical methods using ICP-AES technology may not be used because the detection limits for these methods are 0.008 mg/L (8 µg/L) or higher (40 CFR 141.23(k)(1)). This restriction means that the two ICP-AES methods (EPA Method 200.7 and SM 3120 B) may not be used for compliance determinations.

⁹After January 23, 2006, analytical methods using ICP-AES technology may not be used because the detection limits for these methods are 0.008 mg/L (8 µg/L) or higher (40 CFR 141.23(k)(1)). This restriction means that the two ICP-AES methods (EPA Method 200.7 and SM 3120 B) may not be used for compliance determinations.

Figure I-3. Standardized Monitoring Framework for Inorganic Contaminants



Draft for Discussion

I-A.11 Laboratory Methods

I-A.11.a Which analytical methods are acceptable for arsenic?

Several analytical methods and method updates were approved for the analysis of arsenic in drinking water in previous rulemakings. The methods and updates, listed in Table I-2, are based on atomic absorption, atomic emission and mass spectroscopy methodologies and have been used for compliance monitoring of arsenic at the 0.05 mg/L (50 µg/L) MCL by State, federal and private laboratories for many years.

Illustration 5 - System 4 Analytical Methods

The lab analyzing the samples from System 4 used EPA Method 200.7 (ICP-AES) with a detection limit of 0.008 mg/L (8 µg/L) to analyze all of the compliance samples taken before 2006. The system collected samples on March 6, 2007, to satisfy the monitoring required during the 2005 - 2007 compliance period. The laboratory switched to EPA Method 200.8 (ICP-MS) to analyze the samples taken during 2007 because EPA withdrew approval of the less sensitive method 200.7 (ICP-AES) in the Final Arsenic Rule published January 22, 2001.

I-A.11.b Which analytical methods are unacceptable for arsenic?

Effective January 23, 2006, EPA has withdrawn approval of Method 200.7 and SM 3120B as analytical methods that can be used to determine the presence of arsenic in drinking water (40 CFR 141.23(k)(1)). See Illustration 5. These methods are inadequate to reliably determine the presence of arsenic at the MCL of 0.01 mg/L (10 µg/L).

**Table I-2. 40 CFR 141.23(k)(1):
Table of Approved Analytical Methods for Arsenic at the MCL of 0.01 mg/L (10 µg/L)**

| Contaminant and Methodology¹³ | EPA | ASTM³ | SM⁴ |
|---|--------------------|-------------------------|-----------------------|
| Arsenic¹⁴ | | | |
| Inductively Coupled Plasma | 200.7 ² | | 3120B |
| ICP- Mass Spectroscopy | 200.8 ² | | |
| Atomic Absorption; Platform | 200.9 ² | | |
| Atomic Absorption; Furnace | | D-2972-93C | 3113B |
| Hydride Atomic Absorption | | D-2972-93B | 3114B |
| <p>²Methods for the Determination of Metals in Environmental Samples--Supplement I", EPA/600/R-94/111, May 1994. Available at NTIS, PB95-125472.</p> <p>³Annual Book of ASTM Standards, 1994 and 1996, Vols. 11.01 and 11.02, American Society for Testing and Materials. The previous versions of D1688-95A, D1688-95C (copper), D3559-95D (lead), D1293-95 (pH), D1125-91A (conductivity) and D859-94 (silica) are also approved. These previous versions D1688-90A, C; D3559-90D, D1293- 84, D1125-91A and D859-88, respectively are located in the Annual Book of ASTM Standards, 1994, Vols. 11.01. Copies may be obtained from the American Society of Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428.</p> <p>⁴18th and 19th editions of Standard Methods for the Examination of Water and Wastewater, 1992 and 1995, respectively, American Public Health Association; either edition may be used. Copies may be obtained from the American Public Health Association, 1015 Fifteenth Street NW, Washington, DC 20005.</p> <p>¹⁴If ultrasonic nebulization is used in the determination of arsenic by Methods 200.7, 200.8, or SM 3120 B, the arsenic must be in the pentavalent state to provide uniform signal response. For methods 200.7 and 3120 B, both samples and standards must be diluted in the same mixed acid matrix concentration of nitric and hydrochloric acid with the addition of 100 µL of 30% hydrogen peroxide per 100ml of solution. For direct analysis of arsenic with method 200.8 using ultrasonic nebulization, samples and standards must contain one mg/L of sodium hypochlorite.</p> <p>¹³Because method detection limits (MDLs) reported in EPA Methods 200.7 and 200.9 were determined using a 2X preconcentration step during sample digestion, MDLs determined when samples are analyzed by direct analysis (i.e., no sample digestion) will be higher. For direct analysis of cadmium and arsenic by Method 200.7, and arsenic by Method 3120 B sample preconcentration using pneumatic nebulization may be required to achieve lower detection limits. Preconcentration may also be required for direct analysis of antimony, lead, and thallium by Method 200.9; antimony and lead by Method 3113 B; and lead by Method D3559-90D unless multiple in-furnace depositions are made.</p> | | | |

I-A.12 Treatment Technologies and Costs

I-A.12.a Did EPA list best available technologies in the Rule?

EPA listed seven best available technologies (BATs) in the Final Arsenic Rule (66 FR 6976). EPA determined these technologies to be the BATs for the removal of arsenic in drinking water based on a demonstration of efficacy under field conditions taking cost into consideration (40 CFR 141.62(c) and

SDWA §1412(b)(4)(D)). EPA reviewed several technologies to determine the BATs for the removal of arsenic.¹⁰ EPA has identified seven BATs including:

- Activated Alumina;
- Coagulation/Filtration (not BAT for systems with fewer than 500 service connections);
- Ion Exchange;
- Lime Softening (not BAT for systems with fewer than 500 service connections);
- Reverse Osmosis;
- Electrodialysis; and,
- Oxidation/filtration.¹¹

The BATs' removal efficiencies and a brief discussion of the major issues surrounding the usage of each technology can be found in the preamble to the Final Arsenic Rule (66 FR 6976 at 6981). Additional details can be found in the EPA's *Technologies and Costs for the Removal of Arsenic From Drinking Water*, December 2000.

Systems are not required to use BATs to achieve compliance with the MCL. Any technology that is accepted by the State primacy agency and achieves compliance with the MCL is allowed. However, if a system is unable to meet the MCL with its chosen technology, the system is not eligible for a variance unless it has installed a BAT and still cannot achieve compliance. For more information on variances and exemptions see Section I-A.13.

I-A.12.b Did EPA list small system compliance technologies in the Rule?

The technologies examined for BAT determinations were also evaluated as small system compliance technologies (SSCTs). EPA must list SSCTs for three sizes of small systems: systems serving between 25 and 500 people, systems serving between 501 and 3,300 people, and systems serving between 3,301 and 10,000 people (SDWA §1412(b)(4)(E)(ii)). EPA has listed SSCTs that may achieve compliance with the arsenic MCL and that are affordable and applicable to small drinking water systems. Table I-3 below identifies the compliance technologies that EPA deems affordable to small systems. In future versions of this document, Appendix F will contain a STEP guide designed to help small systems comply with the Rule.

Because EPA has listed SSCTs, small systems:

- Will have the latitude to choose the type of treatment technology that is most cost effective and appropriate (from an operation and maintenance standpoint).

¹⁰BATs are for Arsenic V. Pre-oxidation may be required to convert Arsenic III to Arsenic V (40 CFR 141.62(c)).

¹¹To obtain high removal rates, the iron to arsenic ratio must be at least 20:1 (40 CFR 141.62(c)).

- Are not eligible for a *small system variance* since EPA has determined that SSCTs exist for all three size categories.
- May be eligible for a general variance under SDWA §1415(a) if they have installed or agreed to install the BAT but, due to source water quality, will not be in compliance with the MCL.

For more information on variances and exemptions see Section I-A.13.

Table I-3. SSCTs¹ for Arsenic²

| Small System Compliance Technology | Affordable for listed small system categories³ |
|---|--|
| Activated Alumina (centralized) | All size categories |
| Activated Alumina (point-of-use) ⁴ | All size categories |
| Coagulation/Filtration ⁵ | 501-3,300, 3,301-10,000 |
| Coagulation-assisted Microfiltration | 501-3,300, 3,301-10,000 |
| Electrodialysis Reversal ⁶ | 501-3,300, 3,301-10,000 |
| Enhanced Coagulation/filtration | All size categories |
| Enhanced Lime Softening (pH>10.5) | All size categories |
| Ion Exchange | All size categories |
| Lime Softening | 501-3,300, 3,301-10,000 |
| Oxidation/Filtration ⁷ | All size categories |
| Reverse Osmosis (centralized) ⁶ | 501-3,300, 3,301-10,000 |
| Reverse Osmosis (point-of-use) ⁴ | All size categories |

¹Section 1412(b)(4)(E)(ii) of the SDWA specifies that SSCTs must be affordable and technically feasible for small systems.

²SSCTs for Arsenic V. Pre-oxidation may be required to convert Arsenic III to Arsenic V (40 CFR 141.62(d)).

³SDWA §1412(b)(4)(E)(ii) specifies three categories of small systems: (i) those serving 500 or fewer, but more than 25; (ii) those serving 3,300 or fewer, but more than 500; and (iii) those serving 10,000 or fewer, but more than 3,300.

⁴When POU or POE devices are used for compliance, programs to ensure proper long-term operation, maintenance, and monitoring must be provided by the water system to ensure adequate performance (SDWA §1412(b)(4)(E)(ii)).

⁵Unlikely to be installed solely for arsenic removal. May require pH adjustment to optimal range if high removals are needed.

⁶Technologies reject a large volume of water—may not be appropriate for areas where water quantity may be an issue.

⁷To obtain high removals, iron to arsenic ratio must be at least 20:1 (40 CFR 141.62(d)).

The challenges facing small drinking water systems were a major focus of the 1996 Amendments to the SDWA. One way Congress sought to help systems meet these challenges was by allowing systems to install point-of-use (POU) treatment devices to achieve compliance with the NPDWRs (SDWA

§1412(b)(4)(E)(ii)). Point-of-entry (POE) devices were already allowed under the SDWA and are regulated under 40 CFR 141.100.

POU and POE treatment devices rely on many of the same treatment technologies that have been used in central treatment plants. However, while central treatment plants treat all water distributed to consumers, POU devices treat only the water intended for direct consumption, typically at a single tap, and POE treatment devices treat all water used within a single home. After evaluating a variety of treatment technologies, EPA has concluded that POU reverse osmosis and POU activated alumina are SSCTs (40 CFR 141.62(d)).

Centrally managed POU and POE treatment strategies have been successfully demonstrated in the lab and used in communities to provide ongoing compliance with the arsenic MCL.¹² Given the improving effectiveness and decreasing costs of POU and POE treatment equipment, EPA believes that it is feasible for many small systems to own, control, and maintain POE/POU devices for arsenic MCL compliance.

To ensure that POU and POE devices are as protective of public health as central treatment, SDWA requires that (SDWA §1412(b)(4)(E)(ii)):

- POU and POE units be owned, controlled, and maintained by the PWS or by a contractor hired by the PWS to ensure proper operation and maintenance of the devices and compliance with the MCLs.
- POU and POE units have mechanical warnings to automatically notify customers of operational problems.

The primary advantage of using a POU or POE treatment strategy is that implementation may be less expensive than constructing, upgrading, or expanding a central treatment plant.¹³ The cost savings achieved through POU or POE treatment may enable some systems to provide more protection to their consumers than they might otherwise be able to afford.

The successful implementation of a POU or POE treatment strategy will require a system to address several issues:

¹²See the Final Arsenic Rule (66 FR 6976 at 6984) for more information. Case studies of successful arsenic use by small communities include K. Fox, "Field Experience with Point-of-Use Treatment Systems for Arsenic Removal," Journal AWWA, February, 1989, and K. Rogers, "Point-of-Use Treatment of Drinking Water in San Ysidro, NM," EPA CR-812499-01, November, 1988.

¹³EPA estimates that implementation of a centrally managed POU treatment strategy for arsenic can be less expensive than central treatment for communities with populations of up to 250 people (66 CFR 6976 at 6984). After evaluating and incorporating NDWAC Arsenic Cost Working Group cost recommendations, EPA may revise this number.

- As with any treatment technology, not all treatment devices are compatible with all sources of water. Pilot testing on the local source water is necessary prior to the implementation of a POU or POE strategy.
- The system must be able to obtain regular access to POU or POE units to perform necessary maintenance and monitoring. Some systems have successfully passed local ordinances requiring access to be granted as a condition of water delivery. Public education is also crucial to the success of a POU or POE strategy.
- Implementing a POU or POE treatment strategy will require a rigorous preventative maintenance program. Devices may also require frequent sampling. Systems should ensure, prior to implementation, that they have available staff to perform the necessary maintenance, monitoring, and record keeping, or they can make arrangements to contract out their maintenance and monitoring duties.

See Appendix G for a draft guidance on POU treatment devices.

I-A.12.c What are the estimated national costs for complying with the Rule?

EPA estimates the total national annualized costs of treatment, monitoring, reporting, recordkeeping, and administration for this Rule to be approximately \$181 million (using 1999 dollars at a three percent discount rate; see Table I-4)¹⁴. Most of the cost is due to the cost of installing and operating the treatment technologies needed to reduce arsenic in PWSs (both CWSs and NTNCWS). EPA estimates the total treatment cost to be approximately \$177 million per year and the annual monitoring and administrative costs to be about \$2.7 million.

**Table I-4. Annual National System and State Compliance Costs
(3% Discount Rate, \$ millions)**

| System Costs for: | CWS | NTNCWS | Total |
|-----------------------------|--------------|------------|--------------|
| Treatment | \$170 | \$7.0 | \$177 |
| Monitoring/Administrative | \$1.8 | \$0.9 | \$2.7 |
| State Costs | \$0.9 | \$0.1 | \$1.0 |
| Total Estimated Cost | \$173 | \$8 | \$181 |

Table I-5 provides the average estimated annual cost per household to comply with the revised MCL.

¹⁴Information on the costs of treatment technologies used by small systems to comply with the arsenic rule may be found in "Arsenic Treatment Technology Design Manual for Small Systems," EPA 816-R-02-011.

Table I-5. Average Annual Cost per Household for Systems Installing Treatment to Meet the Revised MCL for Arsenic of 0.01 mg/L (10 µg/L)

| System Size | Cost in 1999 dollars |
|-------------------|----------------------|
| <100 | \$326.82 |
| 101-500 | \$162.5 |
| 501-1000 | \$70.72 |
| 1001-3,300 | \$58.24 |
| 3,301-10,000 | \$37.71 |
| 10,001-50,000 | \$32.37 |
| 50,001-100,000 | \$24.81 |
| 100,001-1,000,000 | \$20.52 |
| >1,000,000 | \$0.86 |
| All Categories | \$31.85 |

Additional information on treatment technologies and costs can be found in EPA's *Technologies and Costs for the Removal of Arsenic From Drinking Water*, December 2000.

I-A.13 Variances and Exemptions

I-A.13.a May States grant small system variances for arsenic?

EPA did not identify small system variance technologies for arsenic under SDWA §1415(e). Therefore, small system variances are not available for the Final Arsenic Rule.

I-A.13.b Which systems are eligible for a general variance?

If a system cannot meet the arsenic MCL because of the characteristics of its raw water sources, it may be eligible for a variance under SDWA §1415(a) and 40 CFR 142.20(a) on condition that:

- The system install a BAT (all system sizes), a SSCT (systems serving fewer than 10,001 people), or other means as determined by EPA (SDWA §1415(a)(1)(A) and 40 CFR 142.62(c)); and,
- A State evaluation indicates that alternative sources of water are not reasonably available (SDWA §1415(a)(1)(A)).

While a variance may allow a system to provide water that exceeds the MCL, it will only be granted if the quality of the water delivered under the variance will not result in an unreasonable risk to health (SDWA §1415(a)(1)(A)).

Eligibility for a variance from the MCL for arsenic requires that the public be given an opportunity for a public hearing on the new schedule and that the system install, operate, and maintain a technology specified in the Final Arsenic Rule and enter into a compliance schedule with the primacy agency (SDWA §1415(a)(1)(A) and 40 CFR 142.62(b)&(c)).

I-A.13.c Which systems are eligible for an exemption?

Exemptions can be an important tool for States to assist small systems compliance with the Arsenic Rule. Under appropriate conditions, exemptions can afford certain systems additional time needed to acquire financial assistance and develop mechanisms necessary to ensure compliance.

PWSs are required to meet the new MCL for arsenic by January 23, 2006 (40 CFR 141.6(j)). SDWA §1416(a) and 40 CFR 142.20(b) allow a State to grant an exemption to a PWS from the arsenic MCL if it meets all of the following four criteria:

- Due to compelling factors, the system is unable to achieve compliance by January 23, 2006, through any means, including treatment or alternative source of water supply.
- The system was in operation by February 22, 2002, or, if the system was not in operation by the effective date of the Rule, the system has no reasonable alternative source of drinking water available to it.
- The exemption will not result in an unreasonable risk to health.
- The system cannot reasonably make management or restructuring changes that would result in compliance or improve the quality of drinking water if compliance cannot be achieved.

If granted an exemption, a PWS would have an additional three years to comply (January 23, 2009). When granting an exemption, the State must issue a schedule requiring compliance with the MCLs as expeditiously as practicable but no later than January 23, 2009 (SDWA §1416(a)(2)(A)). Systems serving fewer than 3,300 people may be eligible for up to three additional two-year exemptions, allowing them to delay compliance for a total of nine years beyond 2006 (40 CFR 142.20(a)(2)). Therefore, some small systems may be given exemptions allowing them 14 total years after the Rule was published to obtain their needed financial assistance and implement compliance strategies to comply with the new arsenic MCL. EPA believes that these criteria can be met. Draft guidance on how to implement the exemptions provision is included in Appendix H.

I-B. Summary of Clarifications to Compliance and New Source Contaminants Monitoring for Inorganic Contaminants, Volatile Organic Contaminants, and Synthetic Organic Contaminants

I-B.1 Clarifications to Compliance

I-B.1.a How does the Rule affect compliance determinations for inorganic contaminants, volatile organic contaminants, and synthetic organic contaminants?

States can require more frequent monitoring as well as confirmation samples. Therefore, the clarifications to compliance specify that compliance determinations for contaminants subject to 40 CFR 141.23(i)(2), 141.24(f)(13)&(15)(iii), and 141.24(h)(9)&(11)(iii) will be based on the running annual average of the initial MCL exceedances and subsequent state-required confirmation samples. In addition, the clarifications address calculation of compliance when a system fails to collect the required number of samples. Compliance averages will be based on the total number of samples collected, not the number of samples required. Uncollected samples are still a monitoring and reporting violation. For purposes of calculating MCL averages, non-detections continue to be set at zero unless States specify another value (e.g., the detection limit or a fraction of the detection limit) (40 CFR 141.23(i), 141.24(f)(15), and 141.24(h)(11)).

I-B.2 Requirements for New Systems and Sources

I-B.2.a What are the requirements for new systems and sources?

All new systems, or systems that use a new source of supply, that begin operation after January 22, 2004 must demonstrate compliance with the MCLs within a period of time specified by the State.¹⁵ The State must specify sampling frequencies to ensure that a system can demonstrate on-going compliance with MCLs (40 CFR 141.23(c)(9), 141.24(f)(22), and 141.24(h)(20)). This requirement is effective for all contaminants listed in 40 CFR 141.23(c) and 141.24.

All systems are required to have at least one operator certified through State operator certification programs (SDWA §1419(a)). Certified operators pass an exam to demonstrate they have the knowledge, skills, ability, and judgement to properly operate the system (64 FR 5916 at 5919). As of 1999, new systems are required to have:

¹⁵40 CFR 141.2 defines “State” to include Tribal governments that have primacy and EPA Regions in situations of non-primacy. Therefore, the EPA Regions have the responsibility to establish the new system monitoring requirements for non-primacy States and Tribes.

the legal authority or other means to ensure that all new community water systems and new nontransient, noncommunity water systems commencing operation after October 1, 1999, demonstrate technical, managerial, and financial capacity with respect to each national primary drinking water regulation in effect, or likely to be in effect, on the date of commencement of operations (SDWA §1420(a)).

Many States' new system capacity development programs may include specific monitoring requirements designed to demonstrate that a system meets MCLs prior to system start up.

I-B.2.b Do States need to update their monitoring programs?

Many States have monitoring programs for new systems and for systems that are using a new source of supply. To meet the special primacy requirements of 40 CFR 142.16(k), these States must explain to EPA the monitoring schedule for the revised arsenic MCL and how the schedule will ensure MCL and monitoring compliance by all new systems and systems using a new source of supply. If monitoring schedule determinations are established on a case-by-case basis, States should explain the factors that were considered when making each determination. However, when revising primacy for existing contaminants, States may update their existing monitoring plan or use the monitoring plan submitted previously (40 CFR 141.16(j)(2)).

States that develop or modify their monitoring program for new systems and for systems using a new source should ensure that the program reflects contaminants of concern, known contaminant use, historical data, and vulnerability. Because of varying contaminant uses and sources, some contaminants occur at higher levels in some regions of the country. Additionally, the concentrations of some contaminants are known to show clear seasonal peaks, while others remain constant throughout the year. For example, some States may be concerned with atrazine levels in drinking water and therefore require systems to take multiple samples during a specified vulnerable period (e.g., May 1 - July 31). Another State may only require one sample of atrazine but may require four quarterly samples of trichloroethylene since trichloroethylene concentrations are of concern. States are encouraged to consider contaminant variability when developing or modifying their programs.

For more information on assessing the potential spatial and temporal distributions of currently regulated contaminants, States are encouraged to consult *A Review of Contaminant Occurrence in Public Water Systems* (EPA 816-R-99-006).

I-C. Key Dates of the Rule

I-C.1 Applicability and Compliance Dates for Arsenic

I-C.1.a Which systems must comply with the Rule?

The Arsenic Rule applies to all CWSs and all NTNCWSs.

I-C.1.b What are important dates of the Rule?

The effective date for monitoring and for compliance with the revised MCL is five years after promulgation. The timetable for the Arsenic Rule is presented in Table I-6 and is based on the Final Arsenic Rule published on January 22, 2001 (66 FR 6976), and the Final Rule delaying the effective date published on May 22, 2001 (66 FR 28342).

Table I-6. Timetable for the Arsenic Requirements

| Date | Arsenic in Drinking Water Rule Requirement |
|---|---|
| January 22, 2001 | EPA promulgates a Final Arsenic Rule. |
| February 22, 2002 | Revised effective date of the Rule. |
| July 1, 2002, and every July 1 thereafter | Systems that detect arsenic concentrations between 0.005 mg/L and 0.01 mg/L (5 µg/L and 10 µg/L) must include the revised educational statement in their CCR. See Section I-A.7.d for more information. |
| July 1, 2002-July 1, 2006 | CCR requirements for reports due in calendar years 2002 to 2006 have been expanded for systems that detect arsenic at levels greater than 0.01 mg/L (10 µg/L) to include specific health effects language. See section I-A.7.e for more information. |
| January 22, 2003 | State primacy revision application package due. |
| January 22, 2004 | NEW systems commencing operation after January 22, 2004, must collect monitoring samples for all IOCs, synthetic organic contaminants (SOCs), and volatile organic contaminants (VOCs) within a period and at a frequency determined by the State. |
| January 1, 2005 | When allowed by the State, ground water systems may grandfather data collected after this date to satisfy the monitoring requirements for the 2005-2007 compliance period. |
| January 22, 2005 | State primacy revision application package due for those States receiving two-year extensions. |
| January 23, 2006 | New MCL of 0.01 mg/L (10 µg/L) becomes enforceable. |
| December 31, 2006 | Surface water systems must complete monitoring for the revised arsenic MCL. |
| July 1, 2007, and every July 1 thereafter | For CCRs covering calendar year 2006 and beyond, systems that detect arsenic between 0.005 mg/L and 0.01 mg/L (5µg/L and 10 µg/L) must include a revised educational statement. In addition, systems violating the new 0.01 mg/L (10 µg/L) arsenic standard must include health effects language. See Section I-A.7.e for more information. |
| December 31, 2007 | Ground water systems must complete monitoring for the revised arsenic MCL. |

Section II.

SDWIS/FED Reporting, Compliance Determination, and SNC Definitions

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II-A. SDWIS/FED Reporting

Table II-1 is a summary of proposed Safe Drinking Water Information System/Federal (SDWIS/FED) reporting requirements for the Final Arsenic Rule. The summary contains SDWIS/FED violation and contaminant codes. It is important to note that the SDWIS/FED reporting requirements for the Final Arsenic Rule are no different from the existing reporting requirements for IOCs under the Phase II/V Rules. A detailed list of violations for data management and enforcement purposes will be included in future versions of this guidance in Appendix E. SDWIS/FED reporting summaries are included Appendix I.

Table II-1. Final Arsenic Rule Federal Reporting Violations

| Contaminant Code | Contaminant | Violation Code/Definition |
|------------------|-------------|---|
| 1005 | Arsenic | 02 MCL, Average |
| | | 03 Failure to Monitor/Report |
| | | 04 Failure to Monitor/Report, Check/Repeat/Confirmation |
| | | 06 Failure to Provide the Appropriate Public Notification |
| | | 08 Variance/Exemption/Other Compliance |

II-B. Compliance Determination

States must determine compliance based on the analytical result(s) obtained at each sampling point¹⁶ (40 CFR 141.23(i)). A system is in violation if:

- Any one sampling point exceeds the MCL and then, after four consecutive quarterly samples, the running annual average exceeds the MCL.¹⁷
- Any result causes the running annual average to exceed the MCL at any sampling point (for example, the analytical result is greater than four times the MCL or two analytical results are greater than twice the MCL).

Compliance determination for all IOCs, SOCs, and VOCs is now consistent with the compliance determination for arsenic described here (40 CFR 141.24 (f)(15)&(h)(11)).

For systems monitoring more than once per year, compliance with the MCL is determined by a running annual average at each sampling point. Systems monitoring annually or less frequently whose sample

¹⁶For the purposes of compliance determination and monitoring requirements, the State must report results to the nearest 0.001 mg/L (40 CFR 141.23(i)(4)).

¹⁷States have the flexibility to require confirmation samples. The average of the initial sample and any confirmation samples will be used for the determination of compliance and future monitoring requirements.

result exceeds the MCL, must revert to quarterly sampling for that contaminant the next quarter.¹⁸ Systems are only required to conduct quarterly monitoring at the sampling point at which the sample was collected and for the specific contaminant that triggered the system into the increased monitoring frequency. An exceedance is not necessarily a violation. **Systems triggered into increased monitoring will not be considered in violation of the MCL until they have completed one year of quarterly sampling** unless any sample collected during quarterly monitoring would result in the annual average exceeding the MCL (40 CFR 141.23(i)). For the purpose of calculating the running annual average, the initial exceedance is considered to be the first quarterly sample. In this case, the sampling point will be considered in violation of the MCL immediately.

Systems may not monitor more frequently than specified by the State to determine compliance unless they have applied to and obtained approval from the State. If a system does not collect all required samples when compliance is based on a running annual average of quarterly samples, compliance will be based on the running annual average of the samples collected. If a sample result is less than the method detection limit, zero will be used to calculate the annual average (40 CFR 141.23(i)(1)&(2)). States have the discretion to delete results of obvious sampling or analytic errors (40 CFR 141.23(f)(3)).

States still have the flexibility to require confirmation samples for positive or negative results¹⁹ (40 CFR 141.23(g)). States may require more than one confirmation sample to determine the average exposure (40 CFR 142.11(1)). If confirmation samples are required by the State, the average of the analytical result and the confirmation sample must be used for compliance determinations (40 CFR 141.23(i)(2)).

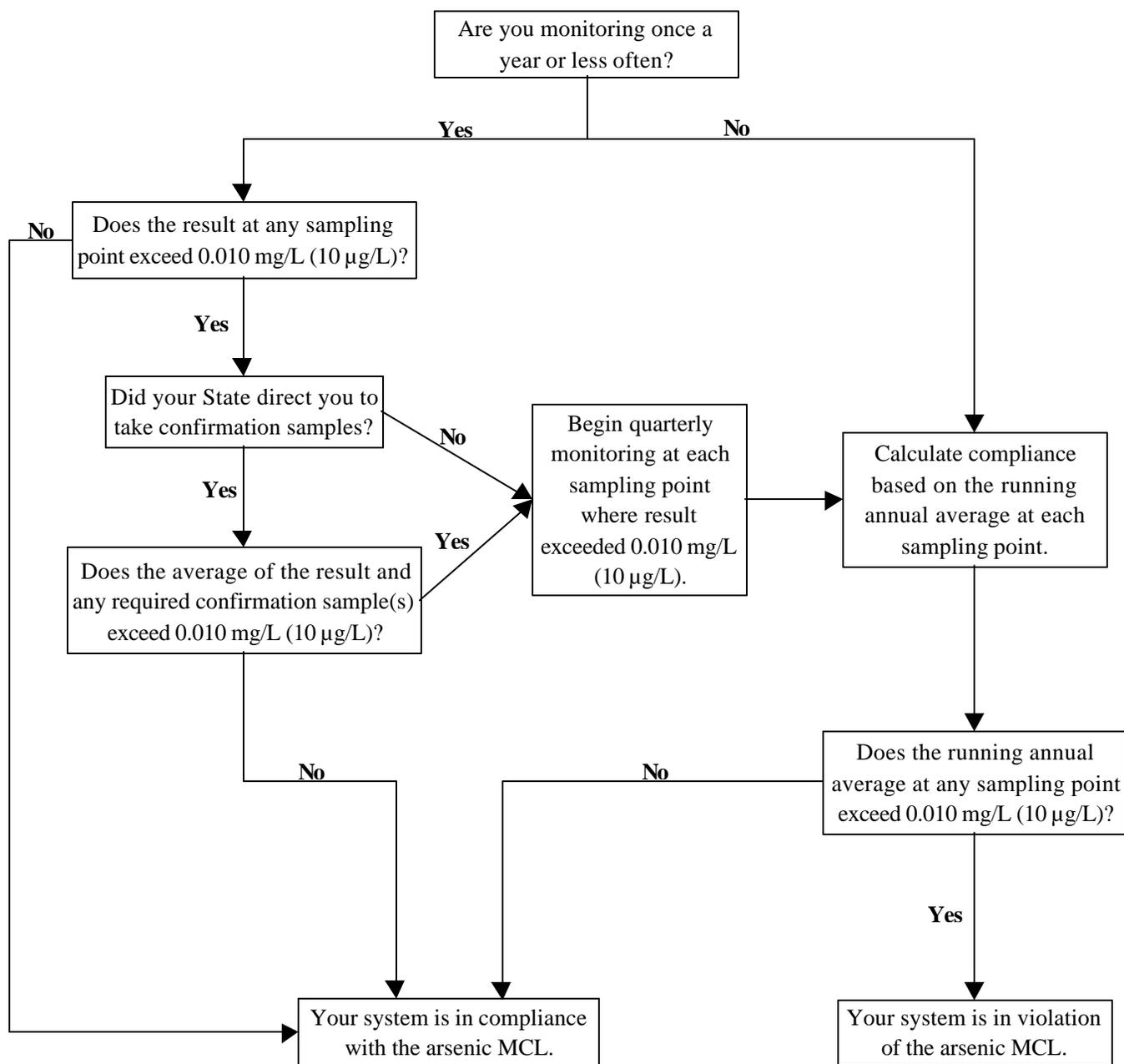
The Rule requires that monitoring be conducted at all EPTDSs (40 CFR 141.23(a)(1)&(2)). However, the State can require monitoring and determine compliance based on a case-by-case analysis of individual drinking water systems. EPA encourages drinking water systems to inform State regulators of their individual circumstances. Some systems have implemented elaborate plans including targeted, increased monitoring that is much more representative of the average annual mean contaminant concentration to which individuals are being exposed. (Some States determine compliance based on a time- or flow-weighted average.) In many cases, the State can demonstrate that compliance is being calculated based on scientific methods that are more representative of the true contaminant concentration to which individuals are being exposed over a year, but it substantially increases the sampling and analytical costs. Some States require that systems collect samples from wells that operate for only one month out of the year regardless of whether they are operating during scheduled sampling times. The State may determine compliance based on several factors including the quantity of water supplied by a source, the duration of service of the source, and contaminant concentration.

¹⁸States have the flexibility to require confirmation samples. The average of the initial sample and any confirmation samples will be used for the determination of compliance and future monitoring requirements.

¹⁹Confirmation samples are any samples that the State requires that go beyond the minimum federally required samples.

Figure II-1 depicts compliance determination with the new arsenic MCL.

Figure II-1. Compliance Determination with the New Arsenic MCL



II-C. SNC Definition

EPA's Office of Enforcement and Compliance Assurance (OECA) is in the process of developing new guidance in an effort to update its significant non-compliance definitions. However, at this time, EPA will use the following definition to remain consistent with the Radionuclides Rule and OECA's draft guidance.

A system is characterized as a significant noncomplier (SNC) if it has a monitoring result twice the MCL, which for arsenic would be 0.02 mg/L (20 µg/L).

A system monitoring more frequently than once a year is characterized as a SNC if it fails to monitor or report analytical results for arsenic for two consecutive monitoring periods. A system monitoring once a year or less is characterized as a SNC if it fails to monitor or report the analytical results for arsenic in one monitoring period.

Section III.

Primacy Revision Application

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III-A. State Primacy Program Revisions

40 CFR 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 SDWA §1413. The 1996 SDWA Amendments update 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).

Pursuant to 40 CFR 142.12(b)(1), complete and final requests for approval of program revisions to adopt new or revised EPA regulations must be submitted to the Administrator no later than two years after promulgation of the new or revised federal regulations (see Table III-1). Until those applications are approved, EPA Regions have responsibility for directly implementing the Arsenic Rule. The State and EPA can agree to implement the Rule together during this period. EPA anticipates such agreements for the Arsenic Rule. Once a State submits a complete and final revision package, it will have primary implementation and enforcement authority. A State may be granted an extension of time, up to two years, to submit its application package. During any extension period, the rule requires an extension agreement outlining the State's and EPA's responsibilities. Appendix J contains a sample extension agreement.

Table III-1. State Rule Implementation and Revision Timetable

| EPA/State Action | Time Frame |
|--|--|
| Rule published by EPA | January 22, 2001 |
| State and EPA Region establish a process and agree upon a schedule for application review and approval | Spring 2002 |
| State, at its option, submits <i>draft</i> program revision package including: Preliminary Approval Request Draft State Regulations and/or Statutes Regulation Crosswalk | Summer 2002 (Suggested) |
| EPA Regional (and Headquarters if necessary) review of draft | Completed within 90 days of State submittal of Draft |
| Suggested (goal) date for State to submit final program revision package | October 2002 |
| Regulatory date for State to submit final program revision package including: Adopted State Regulations Regulation Crosswalk 40 CFR 142.10 Primacy Update Checklist 40 CFR 142.14 and 142.15 Reporting and Record Keeping 40 CFR 142.16 Special Primacy Requirements Attorney General's Enforceability Certification | January 22, 2003* |
| EPA final review and determination: Regional review (program and ORC) Headquarters concurrence and waivers (OGWDW, OECA, OGC) Public Notice Opportunity for hearing EPA's Determination | Completed within 90 days of State submittal of final package 45 days Region 45 days Headquarters |
| Regulatory date for State to submit final program revision package with a two-year extension | January 22, 2005 |
| New MCL of 0.01 mg/L (10 µg/L) becomes enforceable | January 23, 2006 |
| *An extension of up to two additional years may be requested by the State. | |

III-A.1 The Revision Process

The approval of State program revisions is recommended to be a two-step process comprised of submission of a draft request (optional) and then submission of a complete and final request for program approval.

Draft Request—A State may submit a draft request for EPA review and tentative determination. The request should contain drafts of all required primacy application materials. A draft request should be submitted within nine months after rule promulgation. EPA will make a tentative determination on whether the State program meets the applicable requirements (40 CFR 142.12(d)(1)). The tentative determination should be made within 90 days.

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

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 five months of promulgation.

III-A.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 (40 CFR 142.12(d)(3)(i)). The Office of Ground Water and Drinking Water (OGWDW) and OECA will conduct detailed reviews of the first State package from each Region. We ask that the Region submit their comments with the State's package for Headquarters review. When the Region has identified all significant issues, OGWDW and OECA will waive concurrence on all other State programs in that Region, although they will retain the option to review additional State programs with cause. The Office of General Counsel (OGC) has delegated their review and approval to the Office of Regional Counsel (ORC).

In order to meet the 90 day deadline for packages undergoing Headquarters review, the review period will be equally split giving both the Regions and Headquarters 45 days to conduct their respective reviews. For the first package in each Region, EPA Regional offices should forward copies of the primacy revision applications to the Drinking Water Protection Division Director in OGWDW, who will take the lead on the review process.

III-B. State Primacy Program Revision Extensions

III-B.1 The Extension Process

Under 40 CFR 142.12(b), States may ask that the 2-year deadline for submitting the complete and final request for EPA approval of program revisions be extended for up to two additional years in certain circumstances. The extension request must be submitted to EPA within two years of the date that EPA published the regulation (40 CFR 142.12(b)(1)). Each Regional Administrator has been delegated authority to approve extension applications. Headquarters concurrence on extensions is not required.

III-B.2 Extension Request Criteria

For an extension to be granted, the State must demonstrate that it is requesting the extension because it cannot meet the original deadline for reasons beyond its control, despite a good faith effort to do so (40 CFR 142.12(b)(2)). 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 (40 CFR 142.12(b)(2)(i)):

- (i) The State currently lacks the legislative or regulatory authority to enforce the new or revised requirements; or,
- (ii) The State currently lacks adequate program capability to implement the new or revised requirements; or,
- (iii) 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 (40 CFR 142.12(b)(2)(ii)).

III-B.3 Conditions of the Extension

To be granted an extension, the State must agree to meet certain conditions during the extension period (40 CFR 142.12(b)(3)). These conditions will be negotiated by the Region and the State 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 (40 CFR 142.12(b)(3)). Appendix J contains a sample extension agreement.

Conditions of an extension agreement may include:

- Informing PWSs of the new EPA (and upcoming State) requirements and 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 (telephone calls, letters, etc.).
- 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 during the extension period to remedy the deficiency.
- Providing the Region with all the information required under 40 CFR 142.15 on State reporting.

Table III-2 provides a checklist the Region can use to review State extensions.

Table III-2. Extension Request Checklist

| | | |
|--|---|------------------------------------|
| I. Reason for State Request | | |
| <input type="checkbox"/> | Clustering of Program Revisions | |
| <input type="checkbox"/> | Statutory Barrier | |
| <input type="checkbox"/> | Regulatory Barrier | |
| <input type="checkbox"/> | Lack of Program Capability | |
| | <input type="checkbox"/> Insufficient Resources | |
| | <input type="checkbox"/> Funding Level | |
| | <input type="checkbox"/> Staffing | |
| | <input type="checkbox"/> Lack of Adequately Trained Staff | |
| | <input type="checkbox"/> Inadequate Procedures, Guidelines, and Policies | |
| <input type="checkbox"/> | Other _____ | |
| II. Actions Taken by the State to Justify an Extension | | |
| | | Schedule Dates (or attachments) |
| <input type="checkbox"/> | Seeking Increases in Program Resources | _____ |
| <input type="checkbox"/> | Training Existing Personnel/Revising Training Programs | _____ |
| <input type="checkbox"/> | Revising State Regulations or Statutes | _____ |
| <input type="checkbox"/> | Developing Revised/New Procedures, Guidelines, Policies | _____ |
| <input type="checkbox"/> | Other _____ | _____ |
| III. Extension Decision | | |
| <input type="checkbox"/> | Extension Request Approved | Date: ___/___/___ |
| | <input type="checkbox"/> Period of Extension Request: ___/___/___ | to ___/___/___ |
| <input type="checkbox"/> | Extension Request Denied | Date: ___/___/___ |
| | <input type="checkbox"/> Reason Cited: _____ | |
| IV. Conditions of the Extension | | |
| During the extension period the State will (check all that apply): | | |
| <input type="checkbox"/> | Inform PWSs of the new requirements and the fact that EPA will be overseeing their implementation until the State's program is approved or submitted if the State qualifies for interim primacy | |
| <input type="checkbox"/> | Collect and store laboratory results and other compliance data | |
| <input type="checkbox"/> | Provide technical assistance to PWSs | |
| <input type="checkbox"/> | Provide EPA with the information required under section 40 CFR 142.15 of the primacy rule | |
| <input type="checkbox"/> | Other _____ | |

III-C. State Primacy Package

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

III-C.1 The State Primacy Revision Checklist (40 CFR 142.10)

This section is a checklist of general primacy requirements, taken from 40 CFR 142.10, as shown in Table III-3. In completing this checklist, the State must identify the program elements that it has revised in response to new federal requirements (40 CFR 142.12(c)(1)(i)). If an element has been revised the State should indicate a “Yes” answer in the second column next to the list of program elements and should submit appropriate documentation. For elements that need not be revised, the State need only list the citation and date of adoption in the second column. During the application review process, EPA will insert findings and comments in the third column.

Table III-3. State Primacy Revision Checklist

| Required Program Elements | | Revision to State Program | EPA Findings/Comments |
|---------------------------|--|---------------------------|-----------------------|
| 40 CFR 142.2 and 142.10 | Primary enforcement -- Definition of PWS* | | |
| 40 CFR 142.10(a) | Regulations no less stringent | | |
| 40 CFR 142.10(b)(1) | Maintain inventory | | |
| 40 CFR 142.10(b)(2) | Sanitary survey program | | |
| 40 CFR 142.10(b)(3) | Laboratory certification program | | |
| 40 CFR 142.10(b)(4) | Laboratory capability | | |
| 40 CFR 142.10(b)(5) | Plan review program | | |
| 40 CFR 142.10(b)(6)(i) | Authority to apply regulations | | |
| 40 CFR 142.10(b)(6)(ii) | Authority to sue in courts of competent jurisdiction | | |
| 40 CFR 142.10(b)(6)(iii) | Right of entry | | |
| 40 CFR 142.10(b)(6)(iv) | Authority to require records | | |
| 40 CFR 142.10(b)(6)(v) | Authority to require public notification | | |
| 40 CFR 142.10(b)(6)(vi) | Authority to assess civil and criminal penalties | | |
| 40 CFR 142.10(b)(6)(vii) | Authority to require CWSs to provide CCRs** | | |
| 40 CFR 142.10(c) | Maintenance of records | | |
| 40 CFR 142.10(d) | Variance/exemption conditions (if applicable)*** | | |
| 40 CFR 142.10(e) | Emergency plans | | |
| 40 CFR 142.10(f) | Administrative penalty authority* | | |

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

** New regulation published in the August 19, 1998 *Federal Register*.

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

The 1996 SDWA Amendments include several new provisions. Failure of States to adopt provisions at least as stringent as these new provisions can affect primacy for the Arsenic Rule. However, States may still receive interim primacy for the Arsenic Rule even if they have not yet revised their base program to comply with the new statutory requirements provided that the State has received an extension to adopt these requirements and that this extension period has not expired (up to April 2002 with full extension).

Rule Bundling—States may bundle the primacy revision packages for multiple rules. The Attorney General statement should reference the new requirements.

III-C.2 Text of the State’s Regulation

Each primacy application package must include a citation to the applicable State regulation (40 CFR 142.12(c)(1)(i)).

III-C.3 Primacy Revision Crosswalk

The Primacy Revision Crosswalk, found in Appendix K, 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.”

III-C.4 State Record Keeping and Reporting Checklist (40 CFR 142.14 and 142.15)

There are no new State record keeping or reporting requirements under the Arsenic Rule.

III-C.5 Special Primacy Requirements (40 CFR 142.16)

Section III-D of this guidance includes information on how States may choose to meet each Special Primacy Requirement.

III-C.6 Attorney General’s Statement of Enforceability

The complete and final primacy revision application must include an Attorney General statement certifying that the State regulations were duly adopted and are enforceable (40 CFR 142.12(c)(1)(iii)). The Attorney General’s statement should also certify that the State does not have an audit privilege or immunity law, or if it has such a law, that it does 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 statement for the Arsenic Rule is presented in Table III-4. (See Appendix L for details on Audit and Privilege Laws.)

Table III-4: Example of Attorney General 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.

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 the Safe Drinking Water Act. 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 2/14/97 in determining 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.

Model Language

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 (3) ability 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 (3) ability 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 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

III-D. Guidance for Special Primacy Requirements

This section contains guidance States can use when addressing the special primacy requirements of 40 CFR 142.16. It specifically addresses the special primacy conditions added for implementation of the Arsenic Rule. The guidance addresses special primacy conditions in the same order that they occur in the Rule.

States should note that, in several sections, the guidance makes suggestions and offers alternatives that go beyond the minimum requirements indicated by reading the subsections of 40 CFR 142.16. EPA does this to provide States with information and/or suggestions that may be helpful to States' implementation efforts. Such suggestions are prefaced by "may" or "should" and are to be considered advisory. They are not required elements of States' applications for program revision.

III-D.1 Special Primacy Requirements

Background

In the January 22, 2001, Arsenic Rule, EPA revised the special primacy requirements under 40 CFR 142.16(e) to apply to newly regulated contaminants, not existing regulated contaminants such as arsenic. The special primacy requirements under 142.16(e) require States to provide EPA with a detailed waiver program and a monitoring plan for the revised MCL by which the State would assure all systems monitor within the regulatory deadline. EPA recognized that, for already regulated contaminants, States could simply use the existing approved waiver programs and monitoring plans. Therefore, the Agency revised special primacy requirements for existing regulated contaminants such as arsenic. Under the Final Rule, the "contents of a State request for approval of a program revision" in 40 CFR 142.12(c) and the revised special primacy requirements in 142.16(j) and 142.16(k), are applicable for EPA review and approval of State programs adopting the arsenic revisions.

142.16 Special primacy requirements

40 CFR 142.16(j) requires:

An application for approval of a State program revision which adopts the requirements specified in §§141.11, 141.23, 141.24, 141.32, 141.40, 141.61 and 141.62 for an existing regulated contaminant must contain the following (in addition to the general primacy requirements enumerated elsewhere in this part, including the requirement that State regulations be at least as stringent as the federal requirements):

(1) If a State chooses to issue waivers from the monitoring requirements in 141.23, 141.24, and 141.40, the State shall describe the procedures and criteria which it will use to review waiver applications and issue waiver determinations. The State shall provide

the same information required in paragraph (e)(1)(i) and (ii)²⁰ of this section. States may update their existing waiver criteria or use the requirements submitted under the National Primary Drinking Water Regulations for the inorganic and organic contaminants (i.e. Phase II/V rule) in 16(e) of this section. States may simply note in their application any revisions to existing waiver criteria or note that the same procedures to issue waivers will be used.

States wanting to issue monitoring waivers may satisfy the special primacy requirement in 40 CFR 142.16(j)(1) by describing their waiver program or by simply explaining to EPA in their primacy revision package any revisions to their existing waiver criteria or noting that the same procedures to issue waivers will be used. For States that have neither developed a waiver program nor want further guidance before updating their waiver program, EPA recommends reviewing the Phase II/V waiver guidance. EPA also completed a study, *A Review of Contaminant Occurrence in Public Water Systems* (EPA 816-R-99-006) and believes that the report can be used as an effective tool for States' use in reviewing their drinking water monitoring programs. States may wish to use the results of the data analysis to reevaluate their waiver program and monitoring schedules to focus on vulnerable systems.

40 CFR 142.16(j)(2) requires:

A monitoring plan by which the State will ensure all systems complete the required monitoring by the regulatory deadlines. States may update their existing monitoring plan or use the same monitoring plan submitted under the National Primary Drinking Water Regulations for the inorganic and organic contaminants (i.e. Phase II/V rule) in 16(e) of this section. States may simply note in their application any revisions to an existing monitoring plan or note that the same monitoring plan will be used. The State must demonstrate that the monitoring plan is enforceable under State law.

For 40 CFR 142.16(j)(2), States should simply explain how they will modify their monitoring plan for arsenic to fit within their existing monitoring plan for Phase II/V IOCs. EPA recommends that States without Phase II/V primacy establish a schedule for revised MCL monitoring for all of their systems. Some States may choose to phase-in the monitoring over the three year compliance period based on system size or source of water. Other States may simply require one-third of their systems to monitor during each year of the three-year compliance period. States may prepare and submit such a schedule with their primacy revision application. States could also specify that they will use the schedule they developed for implementing the Phase II/V rules (standardized monitoring framework) for IOC monitoring. The Final Rule was developed so that arsenic monitoring would fit into the standardized monitoring framework. The State must also describe how the schedule will be enforced and the authority that will allow the State to enforce the schedule.

²⁰ 142.16(e)(1): *If a State chooses to issue waivers from the monitoring requirements in §§ 141.23 and 141.24, the State shall describe the procedures and criteria which it will use to review waiver applications and issue waiver determinations.*

40 CFR 142.16(k) requires:

States establish the initial monitoring requirements for new systems and new sources. States must explain their initial monitoring schedules and how these monitoring schedules ensure that public water systems and sources comply with MCLs and monitoring requirements. States must also specify the time frame in which new systems will demonstrate compliance with the MCLs.

Many States already have developed monitoring programs for new systems and for systems that are using new sources of water. To meet the requirements of 40 CFR 142.16(k), States that have existing requirements should simply explain to EPA in their primacy revision package the monitoring schedule and how the State can ensure that all new systems and new sources will comply with the existing MCLs and monitoring requirements. Some States may wish to explain that monitoring for new systems is established on a case-by-case basis. States should explain the factors that are considered as case-by-case determinations are made.

When a State develops or modifies an initial monitoring program for new systems and new sources, they should ensure that the program reflects the contaminant(s) of concern for that State, known contaminant use, historical data, and vulnerability. Because of varying contaminant uses and sources, some contaminants occur at higher levels in some regions of the country than in other regions. Additionally, the concentrations of some contaminants are known to show clear seasonal peaks, while others remain constant throughout the year. For example, some States may be concerned with atrazine and require multiple samples during a specified vulnerable period (e.g., May 1 - July 31), while another State may only require one sample for the entire year. Alternatively, another State may be concerned about trichloroethylene and require four quarterly samples. For more information on assessing the potential spatial and temporal distributions of currently regulated contaminants, States are encouraged to consult the document entitled *A Review of Contaminant Occurrence in Public Water Systems* (EPA 816-R-99-006).

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Section IV.

Other Resources and Guidance

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IV-A. Technical Information Available on the Arsenic Rule

A series of guidance manuals will support the Arsenic Rule. The manuals will aid EPA, State agencies, and affected PWSs in implementing the Rule and will help ensure that implementation among these groups is consistent. As these manuals become available, they may be found on the EPA web site at <http://www.epa.gov/safewater/arsenic.html>.

IV-B. Fact Sheet



October 31, 2001 EPA ANNOUNCES ARSENIC STANDARD FOR DRINKING WATER OF 10 PARTS PER BILLION

What is EPA announcing?

EPA affirms the appropriateness of a maximum contaminant level (MCL) (or regulatory level) of 10 parts per billion (ppb) for arsenic in drinking water. Today's announcement will provide additional protection to at least 13 million Americans from cancer and other health problems.

Why did EPA delay and review the 10ppb standard adopted in January 2001?

EPA's responsibility is to establish protective health standards in which the public has confidence. Because of the debate surrounding the appropriateness and the cost of the 10 ppb standard (particularly for small water systems), the Administrator sought additional independent expert reviews of the January 2001 regulation.

What are the benefits of setting the standard at 10ppb?

Reducing arsenic from 50 ppb to 10ppb will prevent:

- more than 19-31 cases of bladder cancer per year, prevent 5-8 deaths each year from this cancer,
- more than 19-25 cases of lung cancer, prevent 16-22 deaths from this cancer, and
- a number of cases of non-cancerous diseases, such as heart disease.

How many water systems are affected by this standard?

Of the 74,000 systems regulated by this MCL, approximately 4,000 systems will have to install treatment or take other steps to comply with the 10 ppb standard.

How much will it cost to implement this standard?

EPA estimates that the average annual household water bill may increase by \$32 per year, however, for households in systems that serve less than 3,300 people the cost will be substantially higher (ranging from \$58 - \$327 per household).

When must water systems meet the 10 ppb standard?

Water systems must meet this standard by January 23, 2006.

What is EPA doing to help smaller systems meet the 2006 compliance date?

EPA plans to provide up to \$20 million over the next two years for research and development of more cost-effective technologies to help small systems meet the more protective 10 ppb standard. EPA also will provide technical assistance and training to operators of small systems, which will reduce their compliance costs. Since 1996, states have provided more than \$3.8 in loan assistance through the Drinking Water State Revolving Fund (DWSRF) to help water systems improve their infrastructure.

EPA also provides funding to States for their drinking water programs (including assistance to small systems for control of arsenic) through the Public Water Systems Supervision grants program. Other federal funds are available through Housing and Urban Development's Community Development Block Grant Program, and the Rural Utilities Service of the U.S. Department of Agriculture.

What are the Consumer Confidence Report (CCR) requirements for arsenic after the effective date of this rule?

Community water systems are required to publish annual reports with information on water source, treatment, and any detected contaminants by July 1 of each year. Under the arsenic rule, systems that detect arsenic between 10 and 50 ppb must include health effects information in the CCR. Systems that detect arsenic between 5 and 10 ppb must include an educational statement in the CCR. Systems with arsenic concentrations above 50 ppb (in violation of the existing standard) continue to be required to state they are in violation and must provide health effects information.

When are States required to update their programs for the new Arsenic standard?

Under the Safe Drinking Water Act, States have two years after promulgation to submit a complete and final primacy revision application to EPA. States may request an extension of up to two additional years for program updates. EPA will grant extensions on a case-by-case basis, depending on need. For the arsenic standard, the initial two year period ends January 22, 2003. An extension for the entire two year period would end January 22, 2005.

For More Information

For general information on arsenic in drinking water, contact the Safe Drinking Water Hotline, at (800) 426-4791, or visit the EPA Safewater website at <http://www.epa.gov/safewater> or the arsenic website at <http://www.epa.gov/safewater/arsenic.html> on the Internet.

IV-C. Technical Fact Sheet on the Arsenic Rule



EPA 815-F-00-016
January 2001

Technical Fact Sheet: Final Rule for Arsenic in Drinking Water

1. What are we announcing?

Today's final rule revises the current Maximum Contaminant Level (MCL) from 50 $\mu\text{g/L}$ to 10 $\mu\text{g/L}$ and sets a Maximum Contaminant Level Goal (MCLG) of zero for arsenic in drinking water. In addition, this final rule also clarifies how compliance is demonstrated for many inorganic and organic contaminants in drinking water.

2. What are the requirements of this final rule?

Both community water systems (CWSs) and non-transient, non-community water systems (NTNCWSs) will be required to reduce the arsenic concentration in their drinking water systems to 10 $\mu\text{g/L}$. A CWS is a public water system that serves at least 15 locations or 25 residents regularly year round (e.g., most cities and towns, apartments, and mobile home parks with their own water supplies). An NTNCWS is a public water system that is not a CWS and serves at least 25 of the same people more than 6 months of the year (e.g., schools, churches, nursing homes, and factories).

This final rule is also a vehicle for clarifying two compliance requirements for inorganic contaminants (IOCs), volatile organic contaminants (VOCs), and synthetic organic contaminants (SOCs). When a system fails to collect the required number of samples, compliance averages will be based on the actual number of samples collected. Also, new public water systems and systems using new sources of water must demonstrate compliance within State-specified time and sampling frequencies.

3. How soon after publishing the final rule will the changes take effect?

All CWSs and all NTNCWSs that exceed the MCL of 10 $\mu\text{g/L}$ will be required to come into compliance 5 years after the promulgation of the final rule. Beginning with reports that are due by July 1, 2002, all CWSs will begin providing health information and arsenic concentrations in their annual consumer confidence report (CCR) for water that exceeds $\frac{1}{2}$ the new MCL.

4. Why is this rule significant?

In the 1996 amendments to the Safe Drinking Water Act (SDWA), Congress directed EPA to propose a new arsenic regulation by January 1, 2000 and to issue the final rule by January 1, 2001 (Congress subsequently extended the final rule date to June 22, 2001). EPA published the proposed rule for arsenic on June 22, 2000. The rule proposed an MCL of 5 µg/L for arsenic and EPA took comment on regulatory options of 3 µg/L (the feasible level), 10 µg/L and 20 µg/L. The 1996 amendments to SDWA added discretionary authority for the EPA Administrator to adjust the maximum contaminant level (MCL) if the benefits would not justify the costs (1412(b)(6)). Today's rule is important because it is the second drinking water regulation in which EPA will use the discretionary authority under SDWA Section 1412(b)(6). After careful consideration of the benefits and the costs, EPA has decided to set the drinking water standard for arsenic higher than the technically feasible level of 3 µg/L because EPA believes that the costs would not justify the benefits at this level. EPA believes that the final MCL of 10 µg/L maximizes health risk reduction at a cost justified by the benefits.

5. What health effects are associated with exposure to arsenic from drinking water?

In most drinking water sources, the inorganic form of arsenic tends to be more predominant than organic forms. Inorganic arsenic in drinking water can exert toxic effects after acute (short-term) or chronic (long-term) exposure. Although acute exposures to high doses of inorganic arsenic can cause adverse effects, such exposures do not occur from public water systems in the U.S. that are in compliance with the existing MCL of 50 µg/L. Today's final rule addresses the long-term, chronic effects of exposure to low concentrations of inorganic arsenic in drinking water. Studies link inorganic arsenic ingestion to a number of health effects. These health effects include:

- Cancerous Effects: skin, bladder, lung, kidney, nasal passages, liver and prostate cancer; and
- Non-cancerous effects: cardiovascular, pulmonary, immunological, neurological and endocrine (e.g., diabetes) effects.

6. What are the sources of arsenic contamination in water?

The contamination of a drinking water source by arsenic can result from either natural or human activities. Arsenic is an element that occurs naturally in rocks and soil, water, air, plants, and animals. Volcanic activity, the erosion of rocks and minerals, and forest fires are natural sources that can release arsenic into the environment. Although about 90 percent of the arsenic used by industry in the United States is currently used for wood preservative purposes, arsenic is also used in paints, drugs, dyes, soaps, metals and semi-conductors. Agricultural applications, mining, and smelting also contribute to arsenic releases.

7. How many people and how many systems will be affected by this rule?

Higher levels of arsenic tend to be found more in ground water sources than in surface water sources (i.e., lakes and rivers) of drinking water. Compared to the rest of the United States, the Western states

have more systems with arsenic levels greater than 10 µg/L. Parts of the Midwest and New England have some systems whose current arsenic levels are greater than 10 µg/L, but more systems with arsenic levels that range from 2-10 µg/L of arsenic. While many systems may not have detected arsenic in their drinking water above 10 µg/L, there may be geographic "hot spots" with systems that may have higher levels of arsenic than the predicted occurrence for that area. About 3,000 (or 5.5 percent) of the nation's 54,000 CWSs and 1,100 (or 5.5 percent) of the 20,000 NTNCWSs will need to take measures to lower arsenic in their drinking water. Of the affected systems, 97 percent serve less than 10,000 people. Table 1 below shows the estimated number of CWSs and NTNCWSs that would be affected by this rule and the estimated population served by these public water systems.

| Table 1. Estimates of the Number of CWSs and NTNCWSs That Would Need to Treat and the Population Served by These Systems | | | |
|---|--|--------------------------------|--|
| Regulatory Action | Type of System and Total Number | Number Systems Affected | Total Population Served by the Affected Systems |
| 10 µg/L | CWSs (54,000) | ~ 3,000 | ~ 11 million |
| 10 µg/L | NTNCWSs (20,000) | ~ 1,100 | ~ 1.7 million |

8. How much will this rule cost?

EPA estimates the total national annualized costs of treatment, monitoring, reporting, recordkeeping, and administration for this rule to be approximately \$181 million (using 1999 dollars at a three percent discount rate - Table 2). Most of the cost is due to the cost of installing and operating the treatment technologies needed to reduce arsenic in public water systems (both CWSs and NTNCWS). EPA estimates the total treatment cost to be approximately \$177 million per year. Annual monitoring and administrative costs will be about \$2.7 million and States' costs will be approximately \$1 million.

| Table 2. Annual National System and State Compliance Costs (3% Discount Rate, \$millions) | | | |
|--|--------------|---------------|--------------|
| | CWS | NTNCWS | Total |
| System Costs | | | |
| Treatment | \$170 | \$7.0 | \$177 |
| Monitoring/Administrative | \$1.8 | \$0.9 | \$2.7 |
| State Costs | \$0.9 | \$0.1 | \$1.0 |
| Total Cost | \$173 | \$8 | \$181 |

The average annual household costs for the homes served by the approximately 2,387 CWSs that require treatment are expected to be approximately \$32 per year. The average annual household costs are shown categorized by system size in Table 3. The disparity in household costs between system size is due to economies of scale. Larger systems are able to spread the costs they incur over a larger customer base.

| Table 3. Total Annual Costs (Dollars) per Household for CWSs | | | | |
|---|---------------|------------------|-----------------|----------------------|
| System Size | 25-500 | 501-3,300 | 3.3K-10K | 10K-and above |
| Annual Household Costs | \$ 327-\$162 | \$ 71-\$58 | \$ 38 | \$32-\$0.86 |

The estimated average annual costs for CWSs, which exceed the final MCL of 10 µg/L and are required to treat, are shown in Table 4 categorized by system size.

| Table 4: Average Annual Costs per CWS (Dollars) | |
|--|-----------------------|
| CWS System Size | Costs (\$) |
| 25-500 | \$6,494-\$12,358 |
| 501-3,300 | \$22,100-\$53,086 |
| 3,300-10,000 | \$111,646 |
| 10,000 and above | \$531,584-\$1,340,716 |

9. What are the benefits of this rule?

The rule will protect approximately 13 million Americans served by CWSs and NTNCWSs (this number is based on reducing arsenic from 50 to 10 µg/L). Reducing arsenic from 50 to 10 µg/L will prevent ~ 19-31 cases of bladder cancer and ~ 5-8 deaths due to bladder cancer per year. EPA estimates that reducing arsenic from 50 to 10 µg/L will prevent ~ 19-25 cases of lung cancer and ~ 16-22 deaths due to lung cancer per year. In addition to these quantified benefits, there are substantial non-quantified benefits of this rule, including reducing the incidences of non-cancerous effects summarized above.

The quantified annual benefits for the today's rule range from \$140 to \$198 million. The benefit range consists of both lower and upper bound estimates. These estimates reflect the upper and lower bound of the risk range addressed by this rule as well as different drinking water consumption distributions that were used in our analysis.

10. Is there funding associated with this rule?

Since 1996, the DWSRF has made over \$3.2 billion available for loans to help water systems improve their infrastructure. EPA also provides funding to States that have primary enforcement responsibility for their drinking water programs through the Public Water Systems Supervision (PWSS) grants program. Other federal funds are available through Housing and Urban Development's Community Development Block Grant Program, and the Rural Utilities Service of the U.S. Department of Agriculture. In the most recent year, 2000, the DWSRF and Rural Utilities Service combined made \$1.7 billion available to States and public water systems for capital improvements and infrastructure needs.

11. How did EPA consult with stakeholders?

From 1997-1999, EPA conducted a number of Agency workgroup meetings on arsenic as well as five stakeholder meetings across the country. Representatives of eight federal agencies, 19 State offices, 16 associations, 13 corporations, 14 consulting engineering companies, two environmental organizations, three members of the press, 37 public utilities and cities, four universities, and one Indian tribe attended the stakeholder meetings on arsenic. Five States also provided written comments on implementation issues during the rule development process. The Office of Water staff presented an overview of the arsenic rulemaking to over 900 Tribal attendees in 1998 and provided more detailed information in 1999 to 25 Tribal council members and water utility operators from 12 Indian tribes.

As part of the Small Business Regulatory and Enforcement Flexibility Act (SBREFA) consultation process, EPA also received substantial input from discussions with small entity representatives. The National Drinking Water Advisory Council (NDWAC) provided useful input, particularly on the benefits analysis and small systems affordability. We also posted discussion papers produced for our stakeholder interactions on the Office of Ground Water and Drinking Water (OGWDW) Internet site and sent them directly to participants at stakeholder meetings and others who expressed interest. In addition, EPA provided updates on our rulemaking activities at national and regional meetings of various groups and trade associations. Furthermore, we participated in technical workgroup meetings held by the American Water Works Association (AWWA). EPA received comments from over 1,100 commenters from the public on the proposed rule. EPA has considered these comments carefully in developing today's final rule for arsenic.

12. Where can the public get more information about this final rule?

For general information on arsenic in drinking water, contact the Safe Drinking Water Hotline, at (800) 426-4791, or visit the EPA Safewater website at <http://www.epa.gov/safewater> or the arsenic website at <http://www.epa.gov/safewater/arsenic.html>.

In addition to this technical fact sheet, the following documents and fact sheets will be available to the public at EPA's web site on arsenic in drinking water:

- Federal Register notice of the final arsenic regulation

- Detailed technical support documents on Arsenic in Drinking Water
- Consumer Fact Sheet on Arsenic in Drinking Water

A copy of the Federal Register notice of the final regulation or any of the technical and consumer facts sheets can be obtained by contacting the Safe Drinking Water Hotline at (800) 426-4791 and (703) 285-1093. The Safe Drinking Water Hotline is open Monday through Friday, excluding federal holidays, from 9:00 a.m. to 5:30 p.m. Eastern Time.