



Reference Guide for the Unregulated Contaminant Monitoring Regulation

Foreword

Under §1445(a)(2)(A) of the Safe Drinking Water Act (SDWA), as amended in 1996, the Environmental Protection Agency (EPA) is required to establish criteria for a program to monitor unregulated contaminants and to publish a list of contaminants to be monitored. In response to this requirement, EPA published the revisions to the Unregulated Contaminant Monitoring Regulation (UCMR) for public water systems (PWSs) on September 17, 1999 (64 FR 50556), and in supplemental rules, including the Perchlorate and Acetochlor Rule (March 2, 2000 - 65 FR 11372), and the List 2 Rule (January 11, 2001 - 66 FR 2273). EPA expects to publish other rules detailing minor modifications to the UCMR program and List 3 monitoring requirements and analytical methods, as needed.

This document was designed to provide an overview of the revised UCMR. It is intended to integrate the most essential elements of the UCMR, and to provide a reference guide to the UCMR guidance documents and UCMR rules published by EPA. This document briefly describes the three-tiered monitoring approach to the UCMR, monitoring schedules, reporting requirements, and the roles and responsibilities of States, EPA Regions, and PWSs in UCMR implementation. Note that this document does not explain all UCMR Program requirements in detail. Where more detailed and comprehensive information is available through other EPA guidance documents, the reader is referred to these documents.

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1. Introduction

1.1 Purpose and Background

The requirement to monitor unregulated contaminants was established by the 1986 Amendments to the Safe Drinking Water Act (SDWA). Public water systems (PWSs) were required to report the monitoring results for up to 48 unregulated contaminants to the States or primacy agency under several regulations (40 CFR 141.40(e), (j), and (n)(11) - (12)). Systems with less than 150 service connections were exempt, provided those systems made their facilities available for the States to monitor.

Under §1445(a)(2)(A) of the SDWA, as amended in 1996, the United States Environmental Protection Agency (EPA) was required to establish criteria for a program to monitor for unregulated contaminants and to publish a list of contaminants to be monitored. To fulfill the requirements of the SDWA, EPA published the Revisions to the Unregulated Contaminant Monitoring Regulation (UCMR) for PWSs on September 17, 1999 (64 FR 50556). This regulation included programmatic changes to the UCMR and provided a list of contaminants for which monitoring was required, or would be required in the future. The UCMR set up a three-tiered approach to monitoring for contaminants based on the availability of analytical methods and insights on contaminant properties, as well as fate and transport. In response to public comments, and as relevant analytical methods were refined and developed, EPA published the Perchlorate and Acetochlor Rule on March 2, 2000 (65 FR 11372) and the List 2 Rule on January 11, 2001 (66 FR 2273). As EPA continues to refine and develop additional methods and/or identify minor clarifications or modifications needed for the successful implementation of the UCMR, the Agency will provide additional guidance documents or fact sheets and will promulgate additional rules, as necessary.

The UCMR program was developed in coordination with the Candidate Contaminant List (CCL) and the National Drinking Water Contaminant Occurrence Database (NCOD). The UCMR and the CCL operate on a 5-year cycle to assess the impact of new and emerging drinking water contaminants. The revised UCMR program is a cornerstone of the sound science approach to future drinking water regulation. The data collected through the UCMR program will be stored in the NCOD to facilitate analysis or review of contaminant occurrence, to guide the development of subsequent CCLs, and to support the Administrator's determination of whether or not to regulate a contaminant in the interest of protecting public health.

The SDWA provisions and EPA regulations which are described in this document contain legally binding requirements. This document does not substitute for those provisions or regulations, nor is it a regulation itself. It does not impose legally-binding requirements on EPA, States, or the regulated community, and may not apply to a particular situation based upon the circumstances. EPA and State decisionmakers 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 based on the law and regulations. EPA may change this guidance in the future without notice or an opportunity for comment. Mention of trade names or commercial products does not constitute endorsement or recommendation for use.

1.2 Overview of the UCMR Program

EPA regulates many drinking water contaminants which are known to pose a risk to human health. There are, however, many other potential contaminants which are not currently regulated because of a lack of information regarding contaminant occurrence or potential health effects of such contaminants. Further, there are many new, emerging, or reemerging contaminants that may also need to be evaluated for their occurrence in drinking water. To address the lack of information on the occurrence of some of these contaminants, in 1999, EPA promulgated the new UCMR program (40 CFR §§141.35, 141.40, and 142.15(c)(3)), replacing the previous unregulated contaminant monitoring regulation. In addition, EPA published a Direct Final Rule in the January 8, 1999 *Federal Register* (64 FR 1493) that suspended the third round of the existing unregulated contaminant monitoring program for small PWSs (systems serving less than or equal to 10,000 persons). However, large PWSs (systems serving more than 10,000 persons) were still required to monitor under 40 CFR §§141.35 and 141.40 for the existing unregulated contaminant monitoring program through January 1, 2001, completing their latest round of that monitoring.

EPA evaluated the availability of analytical methods published by EPA and voluntary consensus standard organizations such as the American Society for Testing and Materials (ASTM), the Association of Official Analytical Chemists (AOAC), and the American Public Health Association (APHA) for all of the unregulated contaminants considered for the UCMR. Based on the availability of analytical methods for each unregulated contaminant, EPA developed a tiered monitoring approach comprised of three distinct components.

The first component of the UCMR is Assessment Monitoring, which will be conducted by all of the approximately 2,800 large community water systems (CWSs) and non-transient non-community water systems (NTNCWSs) serving more than 10,000 persons, and by a statistically representative sample of 800 small CWSs and NTNCWSs serving 10,000 or fewer persons (except those systems that purchase *all* of their water from another PWS). Assessment Monitoring will be conducted for the UCMR (1999) List 1 contaminants, where analytical methods have already been developed and refined. Table 1 lists the contaminants to be monitored, and their environmental sources.

Table 1. UCMR (1999) List 1 Contaminants	
<i>Contaminant Name</i>	<i>Environmental Source</i>
2,4-dinitrotoluene (2,4-DNT)	Used in the production of isocyanate, dyes, and explosives
2,6-dinitrotoluene (2,6-DNT)	Used as mixture with 2,4-DNT (similar uses)
Acetochlor	Herbicide used with cabbage, citrus, coffee, and corn crops
DCPA di-acid degradate	Degradation product of DCPA; an herbicide used on grasses and weeds with fruit and vegetable crops
DCPA mono-acid degradate	Degradation product of DCPA; an herbicide used on grasses and weeds with fruit and vegetable crops
4,4'-dichloro dichlorophenyl ethylene (4,4'-DDE)	Degradation product of DDT; a general insecticide
EPTC	Herbicide used on grasses and weeds, with potatoes and corn
Molinate	Selective herbicide used with rice; controls watergrass
Methyl-tert-butyl-ether (MTBE)	Octane booster in unleaded gasoline
Nitrobenzene	Used in the production of aniline, which is used to make dyes, herbicides, and drugs
Perchlorate	Oxygen additive in solid fuel propellant for rockets, missiles and fireworks
Terbacil	Herbicide used with sugarcane, alfalfa, and fruit crops

Note: UCMR (1999) List 1 contaminants are required to be monitored under the Assessment Monitoring component of the revised UCMR. For more information on Assessment Monitoring, please refer to the final UCMR Preamble and Rule (64 FR 50556), and the Perchlorate and Acetochlor Rule (65 FR 11372). Please refer to Appendix A for a list of acronyms and Appendix B for definitions.

The second component of the UCMR includes Screening Survey monitoring for the List 2 contaminants for which analytical methods have been developed, but may need to be further refined before large-scale Assessment Monitoring is conducted. Each Screening Survey will be conducted at 300 PWSs (120 large PWSs and 120 small PWSs) randomly selected from the pool of systems required to conduct Assessment Monitoring. Table 2 lists the contaminants to be monitored and their environmental sources.

Table 2. UCMR (1999) List 2 Contaminants	
<i>Contaminant Name</i>	<i>Environmental Source</i>
1,2-diphenylhydrazine	Used in the production of benzidine and anti-inflammatory drugs
2-methylphenol	Released in automobile and diesel exhaust, coal tar and petroleum refining, and wood pulping
2,4-dichlorophenol	Chemical intermediate in herbicide production
2,4-dinitrophenol	Released from mines, metal, and petroleum plants
2,4,6-trichlorophenol	By-product of fossil fuel burning, used as bactericide and wood/glue preservative
Alachlor ESA	Degradation product of alachlor and other acetanilide pesticides, herbicides used with corn, bean, peanut, and soybean crops to control grasses and weeds
Diazinon	Insecticide used with rice, fruit, vineyards, and corn crops
Disulfoton	Insecticide used with cereal, cotton, tobacco, and potato crops
Diuron	Herbicide used on grasses in orchards and with wheat crops
Fonofos	Soil insecticide used on worms and centipedes
Linuron	Herbicide used with corn, soybean, cotton, and wheat crops
Nitrobenzene (low levels)	Used in the production of aniline, which is used to make dyes, herbicides, and drugs
Prometon	Herbicide used on annual and perennial weeds and grasses
RDX	Used in explosives; ammunition plants
Terbufos	Insecticide used with corn, sugar beet, and grain sorghum crops
Microbiological Contaminant	
<i>Aeromonas</i>	Present in all freshwater and brackish water

Note: UCMR (1999) List 2 contaminants are required to be monitored under the Screening Survey component of the revised UCMR. For more information on Screening Surveys, please refer to the final UCMR List 2 Rule (66 FR 2273). Refer to Appendix A for a list of acronyms and Appendix B for definitions.

The third component of the UCMR is Pre-Screen Testing, which will be conducted at up to 200 large and small PWSs. States will be asked to nominate systems that are particularly vulnerable to the Pre-Screen Testing contaminants. Pre-Screen Testing may be conducted for some of the UCMR (1999) List 3 contaminants for which analytical methods are in the initial stages of development. Table 3 lists the contaminants that may be monitored and their environmental sources.

Table 3. UCMR (1999) List 3 Contaminants	
<i>Contaminant Name</i>	<i>Environmental Source</i>
Adenoviruses	Fecal or hand to mouth transmission
Cyanobacteria (blue-green algae, other freshwater algae, and their toxins)	Bloom in surface water bodies; produce toxins
Caliciviruses	Contaminated food and water; raw shellfish
Coxsackieviruses	Fecal or hand to mouth transmission
Echoviruses	Fecal or hand to mouth transmission
<i>Helicobacter pylori</i>	Fecal or hand to mouth transmission
Microsporidia	Occur in rivers, ponds, lakes, and unfiltered water
Lead-210	A lead isotope and radionuclide; part of the uranium decay series; naturally occurring
Polonium-210	A polonium isotope and radionuclide; part of the uranium decay series; naturally occurring

Note: UCMR (1999) List 3 contaminants are required to be monitored under the Pre-Screen Testing component of the revised UCMR. EPA is conducting analytical methods development for UCMR (1999) List 3 contaminants. For more information on Pre-Screen Testing, refer to the final UCMR Preamble and Rule (64 FR 50555). Refer to Appendix A for a list of acronyms and Appendix B for definitions.

EPA also selected 30 small PWSs (PWSs serving 10,000 or fewer persons) to serve as Index Systems. Index Systems will conduct Assessment Monitoring each year of the 5-year UCMR cycle to provide additional programmatic and data quality control. The monitoring data that EPA (or its contractors) will collect for Index Systems will provide information on temporal variations in contaminant occurrence. Information on the environmental and operating conditions of these 30 systems will also be collected. The detailed information from the Index Systems, together with the monitoring data generated through the three UCMR monitoring components, will enable EPA to develop future regulations that better reflect the environmental characteristics and operating conditions of the approximately 65,000 small PWSs.

General monitoring schedules are related to the type of monitoring (Assessment Monitoring, Screening Survey, or Pre-Screen Testing) being conducted. Each participating system must conduct Assessment Monitoring of UCMR (1999) List 1 contaminants for a 12-month period in the first three years (2001 through 2003) of the 5-year UCMR contaminant listing cycle (2001-2005), as per §141.40(a)(5)(ii)(B). Randomly selected large systems will sample for the UCMR (1999) List 2 contaminants in 2002 (for chemical contaminants) and 2003 (for the microbiological contaminant, *Aeromonas*), while small systems will sample in 2001 and 2003, respectively. No time-frame has been established yet for Pre-Screen Testing of the UCMR (1999) List 3 contaminants, but it would likely be conducted in 2004 or in the next UCMR 5-year listing cycle. Within this general timeframe,

UCMR monitoring schedules may be varied by the States or EPA to allow coordination of UCMR monitoring with compliance monitoring whenever possible.

Figures 1 and 2 provide a summary of the UCMR three-tiered monitoring approach, illustrate the interrelation of the UCMR program components, and show the implementation timeline of UCMR activities. For identification of terms used throughout this guidance document, please see Appendix A for a list of acronyms and Appendix B for a list of definitions.

EPA will directly implement the UCMR, with State participation through Partnership Agreements (PAs) with EPA. The Agency will pay for the testing and shipping costs of Assessment Monitoring for the representative sample of the 800 randomly selected small PWSs. EPA will also pay for the testing and shipping costs of samples for the small PWSs participating in the Screening Surveys and Pre-Screen Testing components of the UCMR program. However, EPA will not pay for any monitoring activities for large systems participating in the UCMR.

Figure 1: Unregulated Contaminant Monitoring Approach

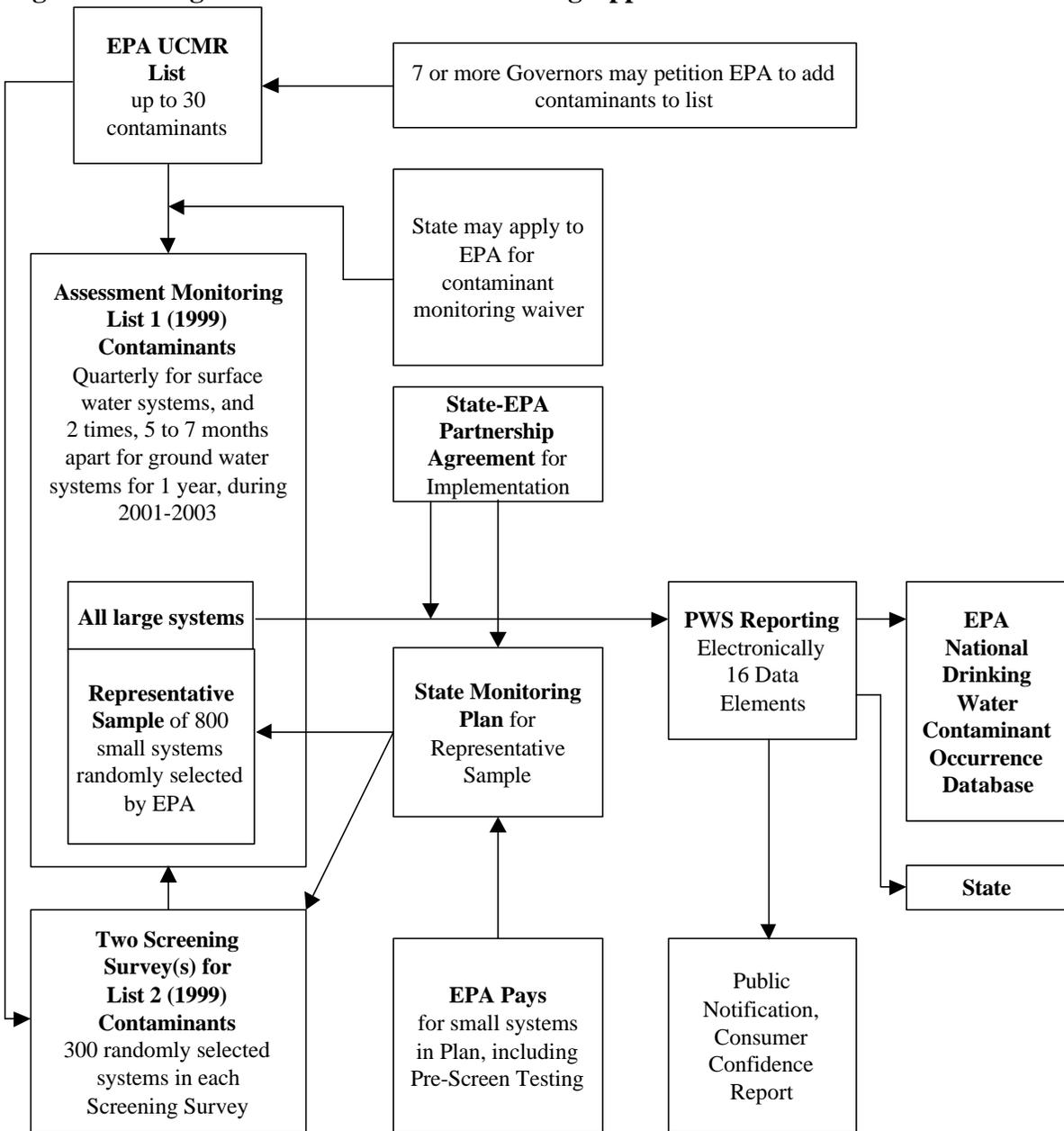
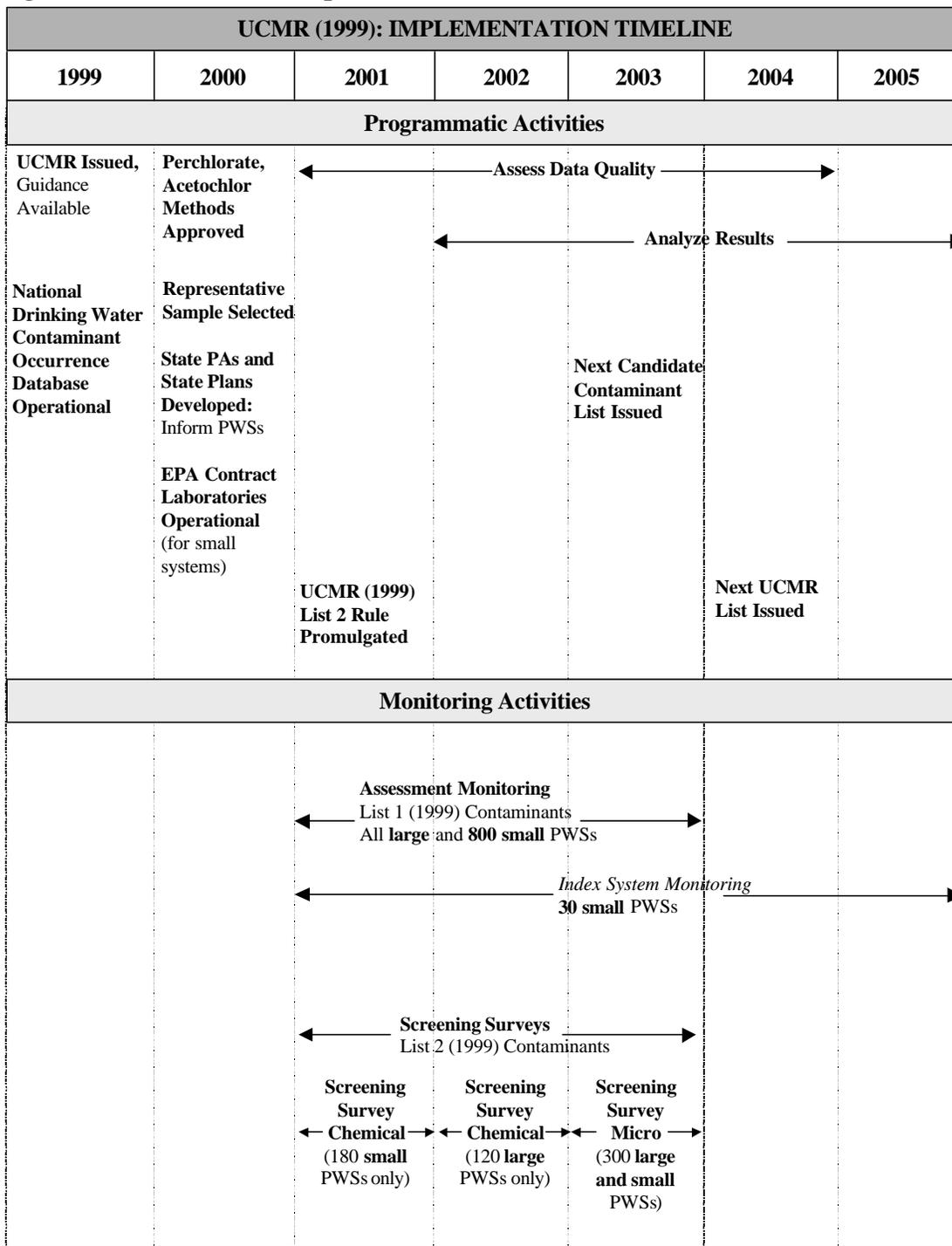


Figure 2: UCMR (1999) Implementation Timeline and Related Activities



This document provides a general overview of the UCMR program, including a description of how PWSs, States, and the EPA are affected by this regulation, and the responsibilities each party has in implementing the UCMR. This document contains a list of all contaminants to be monitored under the UCMR and describes the contaminant monitoring, analysis, and reporting process. It includes the following sections: Affected Entities and Their Responsibilities (Section 2), Contaminants to be Monitored (Section 3), Sample Collection and Analysis (Section 4), General Monitoring Requirements (Section 5), UCMR Reporting Requirements (Section 6), State Responsibility (Section 7), Tribal Responsibility (Section 8), EPA Responsibility (Section 9), and Contact Information (Section 10). Further information about the UCMR program can be found in the UCMR Preamble and final Rule (64 FR 50556), the Perchlorate and Acetochlor Rule (65 FR 11372), the List 2 Rule (66 FR 2273), and UCMR guidance documents.

The documents listed below present detailed information on UCMR program requirements for PWSs, States, and EPA Regions who are responsible for UCMR program planning, implementation, and oversight.

Please note: *Because of the evolving nature of the UCMR program, supplemental rule-making efforts may add additional contaminants to be monitored and hence, additional sampling and analytical procedures may need to be identified. For this reason, EPA will issue supplemental guidance explaining any new requirements. EPA anticipates developing supplemental guidance after analytical methods are approved for monitoring the UCMR (1999) List 2 and 3 contaminants in subsequent rules.*

Background Documents

1. Technical Background Information for the Unregulated Contaminant Monitoring Regulation
EPA 815-R-99-007
This document summarizes the process used to select contaminants for the UCMR List (1999) and a brief summary of the CCL selection process. This document also provides an overview of the proposed methods for monitoring UCMR contaminants.
2. Statistical Design and Sample Selection for the Unregulated Contaminant Monitoring Regulation (1999)
EPA 815-R-01-004
This document replaces National Representative Sample of Small Public Water Systems: Statistical Design and State Plans for Unregulated Contaminant Monitoring, EPA 815-R-99-003. It describes the way in which the sample of small PWSs was selected for participation in the UCMR Assessment Monitoring. This document also describes the selection process for Screening Survey, the probable selection process for the Pre-Screen Testing systems, and briefly describes how Index Systems were selected.

Guidance Documents

1. UCMR (1999) List 1 and List 2 Chemical Analytical Methods Quality Control Manual
EPA 815-R-01-028
This document replaces the UCMR Analytical Methods and Quality Control Manual and Supplements, and adds the new analytical methods quality control (QC) information from UCMR (1999) List 2.

2. Unregulated Contaminant Monitoring Regulation Guidance for Operators of Public Water Systems Serving 10,000 or Fewer People
EPA 815-R-01-002
This document identifies the sampling and reporting responsibilities of small PWSs selected to participate in the Assessment Monitoring component of the UCMR. This guidance also highlights important changes in the UCMR which reduce the monetary and administrative burden on small systems.

Please Note: A draft of this document was released for public comment as EPA 815-R-99-005, and a subsequent final document was release with the number EPA 815-R-00-018. This final guidance document is being released with the number EPA 815-R-01-002, and replaces the previous versions.
3. Unregulated Contaminant Monitoring Regulation Reporting Guidance
EPA 815-R-01-029
This document will provide general guidance to PWSs, States, and EPA Regions on reporting requirements for the results of contaminant monitoring, and inventory information for the UCMR.
4. Implementation Guide for Unregulated Contaminant Monitoring Rule:
Volume I – Introduction to CDX and UCMR Submission
Volume II – Web Forms
Volume III – [not relevant to UCMR]
Volume IV – XML Standards for Submitting Data
Volume V – Flat File Format
Forthcoming
This five volume document provides detailed information on how to use the EPA Central Data Exchange and the Safe Drinking Water Accession and Review System for the UCMR. This guidance is available on the Web at: <http://epacdx.lmi.org/FAQ.asp>.

Fact Sheets

1. Unregulated Contaminant Monitoring Regulation: Monitoring for List 1 Contaminants by Large Public Water Systems
EPA 815-F-01-003
This is a fact sheet for large public water systems which provides a brief overview of their responsibilities in implementing the Assessment Monitoring portion of the UCMR.
2. Unregulated Contaminant Monitoring Regulation: Monitoring for List 1 Contaminants by Small Public Water Systems
EPA 815-F-01-004
This is a fact sheet for small public water systems which provides a brief overview of their responsibilities in implementing the Assessment Monitoring portion of the UCMR.
3. Unregulated Contaminant Monitoring Regulation: Screening Survey for List 2 Contaminants by Selected Large Public Water Systems
EPA 815-F-01-005
This is a fact sheet for large public water systems which provides a brief overview of their responsibilities in implementing the Screening Survey portion of the UCMR.

4. Unregulated Contaminant Monitoring Regulation: Screening Survey for List 2 Contaminants by Selected Small Public Water Systems
EPA 815-F-01-006
This is a fact sheet for small public water systems which provides a brief overview of their responsibilities in implementing the Screening Survey portion of the UCMR.

5. Unregulated Contaminant Monitoring Regulation: Monitoring by Index Systems
EPA 815-F-01-007
This is a fact sheet for Index Systems which provides a brief overview of their responsibilities in implementing the UCMR.

The documents listed above with document numbers are available through the EPA Safe Drinking Water Hotline at (800) 426-4791, or at EPA's UCMR Website: <http://www.epa.gov/safewater/ucmr.html>. Note that the guidance documents above generally outline the sampling and reporting responsibilities for the Assessment Monitoring, and Screening Survey components of the UCMR (1999). EPA will issue further guidance on Pre-Screen Testing requirements and responsibilities after the List 3 rule is promulgated.

2. Affected Entities and Their Responsibilities

2.1 Large Public Water Systems

2.1.1 Assessment Monitoring

All large CWSs and NTNCWSs are required to conduct UCMR Assessment Monitoring including contaminant sampling, analysis, and reporting (§141.40(a)(ii)). Large systems are those serving greater than 10,000 persons. CWSs are PWSs which serve at least 15 service connections used by year-round residents or regularly serve at least 25 year round residents. NTNCWSs are PWSs which are not CWSs, and that regularly serve at least 25 of the same persons over six months per year. Transient non-community water systems (TNCWSs), systems that do not regularly serve at least 25 of the same persons over six months per year, are not required to monitor under the UCMR. Large systems that purchase *all* of their water from other PWSs are also not required to monitor for the Assessment Monitoring or Screening Survey portion of the UCMR (§141.40(a)(iii)). However, some PWSs that purchase water from a PWS selected to monitor for *Aeromonas* may be asked to collect a distribution systemsample. All of the 2,800 large PWSs will be included in the UCMR Assessment Monitoring.

Sample collection responsibilities are discussed in Section 4, general monitoring requirements are discussed in Section 5, and reviewing and reporting responsibilities are discussed in Section 6.

2.1.2 Screening Surveys

The Screening Survey component for large PWSs (§141.40(a)(ii) and §141.40(a)(iii)) is currently divided into two phases, a Screening Survey for chemical contaminants and a Screening Survey for microbiological contaminants. One hundred and twenty (120) randomly selected large PWSs will be required to conduct monitoring for the Screening Survey List 2 chemical contaminants during 2002. A different group of 120 large PWSs will be required to conduct monitoring for the Screening Survey List 2 microbiological contaminant *Aeromonas* during 2003. Each Screening Survey was targeted to consist of 60 systems serving more than 50,000 persons and 60 systems serving from 10,001 to 50,000 persons. The large Screening Survey Systems are further subdivided by water source type (targeted to be 30 ground water and 30 surface water systems). Since there were too few small surface water systems, and too few large ground water systems, the number of systems had to be re-allocated to small ground water and large surface water systems. These Screening Survey systems were selected from the pool of systems conducting Assessment Monitoring. Note that some PWSs which purchase water from a system selected to monitor for *Aeromonas* may be asked to collect distribution system samples. EPA has already identified the randomly selected large systems that will monitor for List 2 contaminants, and has placed this list on its Web site at <http://www.epa.gov/safewater/standard/ucmr/systems.html>.

Depending on the terms of PAs developed by EPA and the States, either EPA or the State may have notified large PWSs of their requirements to monitor for Screening Surveys (see section 7 for more information on the development of PAs). Selected large PWSs are responsible for Screening Survey sampling in 2002 for UCMR (1999) List 2 chemical contaminants, or for Screening Survey sampling for *Aeromonas* in 2003. Large systems may coordinate Assessment Monitoring with Screening Survey monitoring by collecting samples at the same time. Note, however, that all Screening Survey samples for List 2 chemical contaminants must be collected from the entry points to the distribution system

(EPTDS), and not raw water sources (§141.40(a)(7)). This ensures that Screening Survey analytical results may be used to provide an accurate estimation of frequency of contaminant occurrence in finished drinking water sources nationwide.

2.1.3 Pre-Screen Testing

For the Pre-Screen Testing component, up to 200 systems (including both large and small systems) may be selected to conduct UCMR List 3 monitoring (§§141.40(a)(ii) and 141.40(a)(iii)). Pre-Screen Testing may be conducted for contaminants on the UCMR (1999) List 3 whose analytical methods are in the early stages of development. The Pre-Screen Testing systems will be selected by EPA or States, based on the system's vulnerability to the UCMR (1999) List 3 contaminants. The goal of this monitoring is to determine whether the List 3 contaminants can be found in any public water system under contaminant-specific, most-likely-occurrence conditions. Thus, this tier of UCMR monitoring is not designed to determine the extent of occurrence, but rather to test for appropriateness and validity of analytical methods that might be used in a broader monitoring effort (i.e., a future round of Assessment Monitoring). Note that the systems which would be selected to monitor for Pre-Screen Testing contaminants may or may not be the same systems conducting Assessment Monitoring or Screening Survey Monitoring. Pre-Screen Testing will begin after EPA promulgates the List 3 rule. More complete details on the definition of vulnerability and the vulnerable system selection process will be provided in future guidance from EPA.

EPA or the State will notify the large systems which have been selected to monitor for UCMR (1999) List 3 contaminants. Large systems will be responsible for collecting their own samples, sending the samples to an EPA-specified laboratory, and reporting the results to EPA with a copy to the State (§141.40(a)(7)(i) and (ii)). EPA will provide further guidance on Pre-Screen Testing, and large PWS responsibility before Pre-Screen Testing requirements begin (§141.40(a)(7)(i)).

2.2 Small Public Water Systems

2.2.1 Assessment Monitoring

Section 1445(a)(2) of SDWA mandates that only a representative sample of small PWSs be required to monitor for unregulated contaminants. A group of 800 small CWSs and NTNCWSs was selected from the total number of approximately 66,000 small systems nationwide to monitor for the UCMR. The process used to select this subset of small systems was designed to provide a statistically valid, nationally representative sample of the nation's small PWSs serving 10,000 or fewer people. Only the small CWSs and NTNCWSs that are notified by their State or EPA will be required to participate in UCMR sampling. TNCWSs are not required to monitor under the UCMR.

Through its specified contractor, EPA will provide all 800 participating small systems with instructions to collect samples. The overall program is designed to minimize the burden to the small systems selected to monitor. Most significantly, EPA will pay for the cost of shipping and analyzing these samples.

To ensure that the 800 small systems included in the national representative sample adequately represent the total population of small PWSs, the sample was stratified based on population served, source water type (ground water or surface water), and geographic location (i.e., State). Small systems were then randomly selected within these stratifications to ensure that at least two systems were selected in each State (except in Guam, where there was only one active small system eligible

for UCMR monitoring). For more information on the statistical design of the national representative sample, please refer to the document entitled *Statistical Design and Sample Selection for the Unregulated Contaminant Monitoring Regulation (1999)*, EPA 815-R-01-004. Table 4 shows the number of small systems that were selected to monitor for UCMR (1999) List 1 contaminants by system size and source of water. Appendix C shows the number of small systems selected to monitor for List 1 contaminants in each State.

Population	CWS			NTNCWS			Total
	Ground Water	Surface Water	CWS Total	Ground Water	Surface Water	NTNCWS Total	
25-500	76	45	121	36	8	44	165
501-3300	214	39	253	30	7	37	290
3,301-10,000	231	105	336	4	5	9	345
Total	521	189	710	70	20	90	800

Small systems are responsible for properly storing, maintaining, and using the sampling equipment sent out by the EPA contractor, collecting water samples, and sending the samples to the EPA-specified laboratory to be analyzed (§141.40(a)(4)(i)(A), (5)(iii)(B) and (5)(iii)(H)). In some cases, States may elect to conduct the sampling, especially in those that currently collect water samples for regulated contaminant compliance monitoring. States may inform small PWSs of their responsibilities, depending on the terms of individual State PAs (see Section 7).

2.2.2 Screening Surveys

One hundred and eighty small systems will be required to conduct monitoring for the Screening Survey for List 2 chemical contaminants in 2001. A different group of small systems will be required to conduct monitoring for the Screening Survey for *Aeromonas* in 2003. The small Screening Survey systems were randomly selected from the pool of small systems scheduled to conduct Assessment Monitoring in that same year. Thus, if a system was selected to monitor for UCMR (1999) List 1 contaminants in 2001, that system was only eligible to be selected for the Screening Survey in 2001. Monitoring years were selected in this manner so that Assessment Monitoring and the Screening Survey for List 2 chemical contaminants could be coordinated for each small system. Each Screening Survey was targeted to consist of 60 systems from each of the following service size categories: 25 to 500 persons, 501 to 3,300 persons, and 3,301 to 10,000 persons. The number of systems selected in each size category was further stratified by source water type (ground water or surface water). EPA has already identified the Screening Survey Systems for each State. These systems are found in each UCMR State Monitoring Plan for small systems.

Small PWSs selected to monitor for the Screening Surveys may be notified by their State or EPA, depending upon the terms of individual State PAs. Sampling for the Screening Survey for List 2 chemical contaminants in 2001 will be collected at the same frequency as for Assessment Monitoring to minimize the burden of sample collection (§141.40(a)(7)). Systems selected to participate in the Screening Survey for *Aeromonas* will collect samples from three sites within the distribution system. The Screening Survey for *Aeromonas* will not be able to be conducted entirely at the same time as Assessment Monitoring in 2003, since the samples must be collected from different locations and at different frequencies.

The EPA-specified contractor will review the sampling results, and the EPA-specified laboratories will report the analytical results for small PWSs. Small systems are still responsible for ensuring that a copy of the results are reported to the State, and for ensuring compliance with any other applicable State reporting requirements.

2.2.3 Pre-Screen Testing

Up to 200 large and small PWSs will be selected for Pre-Screen Testing. Systems that are most vulnerable to the particular UCMR (1999) List 3 contaminants will be identified by States or EPA for Pre-Screen Testing. List 3 contaminants are those whose analytical methods are in the early stages of development. States or EPA may select systems outside of the 800 selected for Assessment Monitoring for this targeted testing. More complete details on the definition of vulnerability and the vulnerable system selection process will be provided in future guidance from EPA, once the List 3 rule is promulgated.

EPA or the State may notify the small systems which have been selected to monitor for these contaminants, depending on the terms of individual State PAs. For small systems, EPA pays for the cost of sample shipping, analysis, and reporting. EPA will report the results of Pre-Screen Testing for the small systems. EPA will provide further guidance on Pre-Screen Testing, and small PWS responsibility before small systems will be required to monitor for Pre-Screen Testing contaminants (§141.40(a)(7)(ii)).

2.3 Index Systems

To provide a more thorough understanding of contaminants and conditions affecting small systems, and to provide additional data quality assurance for the UCMR data analysis, EPA has selected 30 small PWSs as “Index Systems” from the 800 systems that conduct Assessment Monitoring. Index Systems will conduct Assessment Monitoring every year during the 5-year UCMR cycle, and are required to provide EPA with additional environmental and system operation information. To minimize the additional burden on these systems, EPA will provide for field technicians to assist with sample collection, and will pay for the cost of shipping and testing UCMR samples. In some cases, States may collect the samples for the small systems, rather than the EPA-specified contractor.

Owners/operators of Index Systems are required to assist EPA in identifying appropriate sampling locations and provide information on wells and intakes in use at the time of sampling, well casing and screen depth (if known) for those wells, and the pumping rates of each well or intake at the time of sampling. EPA will collect detailed observations of system operation that may affect contaminant occurrence, such as nature of the source water (type of aquifer or surface water body), number of wells, well depth, configuration of source water intake, treatment, entry points, and how sources are used (seasonally, blended, etc.), as well as other environmental factors. At the time of sampling, EPA, or its contractors, will also gather additional system information to characterize the environmental

setting affecting the system including precipitation, land and water resource use, and environmental factors (such as soil type and geology). This information will assist EPA in more fully evaluating small system operations, and in developing or modifying future regulations for small systems.

2.4 State and Tribal Participation

To minimize the burden of monitoring and data collection efforts on States, Tribes, and Territories, EPA will directly implement the UCMR. However, EPA has encouraged States to become involved in the UCMR program through PAs with EPA. The PAs facilitate State participation in the development and implementation of State Monitoring Plans (SMPs). The States, through the provisions of the SMPs, reviewed and modified the list of systems required to sample, and in some cases, sampling locations. See Section 7 for a more complete description of State participation and Section 8 for Tribal participation. Some States decided not to participate in PAs, in which case EPA established the State Monitoring Plan (SMP) by review of State inventory or direct contact with systems.

3. Contaminants to be Monitored

3.1 Assessment Monitoring

There are 12 unregulated chemical contaminants on the UCMR (1999) List 1. Analytical methods are currently available for all of these contaminants and most of these methods are approved for compliance monitoring (exceptions include EPA Methods 314.0 and 515.4). The List 1 contaminants and their common environmental sources are listed in Table 1. Assessment Monitoring is discussed in greater detail throughout this document as it relates to monitoring requirements, and PWS, State, and EPA responsibility.

3.2 Screening Surveys

There are 15 unregulated chemical contaminants on the UCMR (1999) List 2, and one microbiological contaminant (*Aeromonas*). The List 2 contaminants are shown in Table 2. EPA is conducting the Screening Surveys to analyze for contaminants where the use of newly developed, non-routine analytical methods are required. The Screening Surveys will help EPA to identify whether a contaminant of concern is occurring in drinking water and to estimate the range of concentrations of that occurrence. The Screening Surveys are also intended to allow EPA to screen contaminants to see if they occur at high enough frequencies or at concentrations that justify inclusion in future unregulated contaminant Assessment Monitoring, or at sufficiently low frequencies that they do not require further monitoring.

Analytical methods for RDX and alachlor ESA are currently being refined by EPA. Monitoring for these contaminants is not scheduled for the Screening Surveys. EPA may conduct a third Screening Survey for these contaminants in the 2001 - 2005 round of UCMR monitoring if analytical methods can be developed and validated for use. For more information on this rule, please refer to the List 2 Rule (66 FR 2273).

Note that low level nitrobenzene was added to UCMR (1999) List 2. EPA requires monitoring for nitrobenzene in Assessment Monitoring between 2001 and 2003, using the methods approved in 64 FR 50556. The approved analytical methods for Assessment Monitoring can accurately measure levels of nitrobenzene at concentrations above 10 µg/L; however, recent health effects information indicates that nitrobenzene may be a health concern at lower concentrations. Methods reliably detecting nitrobenzene at concentrations less than 10 µg/L were not available at the time of publication of the September 1999 final UCMR (64 FR 50556). Through additional methods research, EPA developed and refined EPA Method 526, which enables EPA to measure several contaminants on UCMR (1999) List 2, including nitrobenzene, below 10 µg/L. The analytical methods used to detect nitrobenzene under Assessment Monitoring and the Screening Survey can be used to detect several other contaminants on Lists 1 and 2. Because of this, analysis of nitrobenzene will not impose additional costs on systems. Screening Survey monitoring is discussed in greater detail throughout this document as it relates to monitoring requirements, and PWS, State, and EPA responsibility.

3.3 Pre-Screen Testing

There are nine contaminants on the UCMR (1999) List 3, including seven microbiological contaminants and two radiological contaminants. These contaminants and their common environmental sources are listed in Table 3. EPA may conduct Pre-Screen Testing to determine the validity of analytical methods that might be used in a broader monitoring effort (i.e., in a future round of Assessment Monitoring). Pre-Screen Testing is discussed in greater detail throughout this document as it relates to monitoring requirements, and PWS, State, and EPA responsibility.

3.4 Water Quality Parameters

Both large and small PWSs must analyze water quality parameters (WQPs) when monitoring UCMR microbiological contaminants. This currently includes the List 2 Screening Survey contaminant *Aeromonas*. In the future, this is also likely to include many of the List 3 Pre-Screen Testing contaminants. WQPs must be monitored for each sampling event at each sampling point, using the method(s) indicated in Table 5.

Table 5. Water Quality Parameters to be Monitored with UCMR Microbiological Contaminants				
Parameter	Contaminant Type	Methodology		
		EPA Method	Standard Methods¹	Other
pH	Microbiological	150.1 ² 150.2 ²	4500-H ⁺ B	ASTM D1293-84 ³ ASTM D1293-95 ³
Turbidity	Microbiological	180.1 ^{4,5}	2130 B ⁴	GLI Method 2 ^{4,6}
Temperature	Microbiological		2550	
Free Disinfectant Residual	Microbiological		4500-C1 D 4500-C1 F 4500-C1 G 4500-C1 H 4500-C1O ₂ D 4500-C1O ₂ E 4500-O ₃ B	ASTM D 1253-86 ³
Total Disinfectant Residual	Microbiological		4500-C1 D 4500-C1 E ⁴ 4500-C1 F 4500-C1 G ⁴ 4500-C1 I	ASTM D 1253-86 ³

The analytical procedures shall be conducted in accordance with the documents listed in these footnotes. Copies of the documents may be obtained from the sources listed in these footnotes. Information regarding obtaining these documents can be obtained from the Safe Drinking Water Hotline at 800-426-4791. Documents may be inspected at EPA's Drinking Water Docket, 401 M Street, SW., Washington, DC 20460 (Telephone: 202-260-3027); or at the Office of Federal Register, 800 North Capitol Street, NW., Suite 700, Washington, DC.

¹ The 18th and 19th Editions of Standard Methods for the Examination of Water and Wastewater, 1992 and 1995. Methods 2130 B; 2550; 4500-C1 D, E, F, G, H, I; 4500- C1O₂ D, E; 4500-H⁺ B; and 4500-O₃ B in the 20th edition Standard Methods for the Examination of Water and Wastewater, 1998, American Public Health Association, 1015 Fifteenth St. NW, Washington D.C., 20005.

² Methods 150.1 and 150.2 are available from US EPA, NERL, 26 W. Martin Luther King Dr., Cincinnati, Ohio 45268. The identical methods are also in "Methods for Chemical Analysis of Water and Wastes," EPA-600/4-79-020, March 1983, available from the National Technical Information Service (NTIS), U.S. Department of Commerce, 5285 Port Royal Rd., Springfield, Virginia 22161, PB84-128677. (Note: NTIS toll-free number is 800-553-6847.)

³ Annual Book of ASTM Standards, Editions 1994, 1996, 1998 and 1999, Volumes 11.01, American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428. Version D1293-84 is located in the Annual Book of ASTM Standards, 1994, Volumes 11.01. Version D1293-95 is located in the Annual Book of ASTM Standards, 1996, 1998 and 1999, Volumes 11.01.

⁴ "Technical Notes on Drinking Water," EPA-600/R-94-173, October 1994, Available at NTIS, PB95-104766.

⁵ "Methods for the Determination of Inorganic Substances in Environmental Samples," EPA-600/R-93-100, August 1993. Available at NTIS, PB94-121811

⁶ GLI Method 2, "Turbidity," November 2, 1992, Great Lakes Instruments Inc., 8855 North 55th St., Milwaukee, Wisconsin 53223.

4. Sample Collection and Analysis for UCMR (1999) Contaminants

4.1 Large Public Water Systems

Large PWSs are responsible for collecting all UCMR samples in accordance with the timing and frequency requirements presented in Section 5. Large systems must follow the sampling quality control procedures required under §141.40(a)(1)(ii) and (iv) and described in the *UCMR(1999) List 1 and List 2 Chemical Analytical Methods QC Manual* (EPA 815-R-01-028). Once samples are collected, large PWSs are responsible for sending the samples to an EPA-approved laboratory for analysis (§141.40(a)(4)(ii), (5)(ii)(G), and (7)(i)). Laboratory certification requirements are discussed in 40 CFR §141.28, as well as the *QC Manual*. Systems that have laboratories approved to perform UCMR analysis on-site may analyze their own Assessment Monitoring and Screening Survey samples, but the laboratories must follow the required methods and quality control requirements outlined in the *QC Manual* (§141.40(a)(4)(ii), (5)(ii), and (7)(ii)). If samples are sent out to a laboratory, it is the responsibility of the owner/operator to use laboratories that are certified under §141.28, and approved to conduct UCMR analyses, and that these laboratories conform to the methods and quality control requirements approved in the UCMR. Note that for perchlorate and *Aeromonas* there are special Performance Evaluation program requirements.

4.2 Small Public Water Systems

Small PWSs are responsible for collecting all UCMR samples in accordance with the timing and frequency requirements in Section 5. However, some States will collect samples for the small systems. Those sampling for small systems must follow the sampling quality control procedures as directed in the instructions included in sample collection kits (§141.40(a)(4)(iii), (5)(iii), and (7)(iii)). Once the samples are collected, small PWSs are responsible for sending the samples to the EPA-specified laboratory for analysis (§141.40(a)(4)(iii), (5)(iii)(H), and (7)(ii)).

5. General Monitoring Requirements

5.1 Monitoring Frequency and Sampling Location

For chemical contaminants, systems will sample from all EPTDS or other sampling points specified by the State that represent all principal sources of water used over the monitoring period. Note that systems may sample raw water sources for UCMR (1999) List 1 contaminants, if this is the compliance monitoring point required by the State. If a UCMR contaminant is detected, the system must also then initiate monitoring at the EPTDSs for those contaminants detected. Once systems begin monitoring at EPTDSs, they must continue to monitor at these entry points for the next 12-month period, even if the monitoring extends beyond the end of 2003. This flexibility in the sampling location should enable systems and States to coordinate compliance and unregulated contaminant monitoring more extensively. However, all UCMR (1999) List 2 chemical contaminants must be collected at entry points to the distribution system to ensure consistent sampling results nationwide (§141.40(a)(7)).

For UCMR chemical monitoring, surface water-supplied systems will monitor at each of these points every three months for a 12-month period and ground water-supplied systems will monitor at each of these points two times, five to seven months apart, within a 12-month period. Table 6 lists the monitoring frequencies based on contaminant type and source of water.

One of the monitoring events for both surface water and ground water systems must occur at the most vulnerable time of year for the PWS. The default vulnerable time is defined as May 1 through July 31, unless otherwise specified by EPA or the State. Sampling during the most vulnerable time will provide data representing potential variation in contaminant concentration over the course of a year. It is essential that such variations are captured during data collection to evaluate human exposure related to contaminant occurrence. Some systems perform their regulated chemical monitoring on a quarterly basis and can collect UCMR samples coincident with their compliance samples to minimize the labor burden associated with UCMR monitoring. Other systems may only conduct compliance monitoring once every third year and will therefore have to collect additional samples under the UCMR. These systems can collect one UCMR sample coincident with this compliance sample. However, EPA requires that ground water systems take a second sample five to seven months earlier or later to provide data on seasonal variation.

Systems selected to monitor for *Aeromonas* as part of List 2 (Screening Survey) monitoring will collect samples once each quarter, with additional samples taken each month during the warmest quarter of the year, July through September (i.e., six times during the year). This means that sampling must take place in each of the six (6) months of either: January, April, July, August, September, October; or February, May, July, August, September, November; or March, June, July, August, September, December; unless the State or EPA informs the system otherwise. Collecting these six samples will increase the likelihood of detecting sporadic microbial occurrence. Three samples will be collected from each system for each sampling event. Sampling locations must include one midpoint in the distribution system where the disinfectant residual will be expected to be typical for the system (midpoint, or MD, as defined in the Rule), and two other points: one of maximum retention time (point of maximum residence, or MR, as defined in the Rule), and one where the disinfectant residual will have typically declined (location of lowest disinfectant residual or LD, as defined in the Rule).

Table 6. Monitoring Frequency by Contaminant and Water Source Types			
Contaminant Type	Water Source Type	Timeframe	Frequency
Chemical	Surface water	Twelve (12) months	Four (4) quarterly samples taken as follows: Select either the first, second, or third month of a quarter and sample in that same month of each of four (4) consecutive quarters ^a to ensure that one of those sampling events occurs during the vulnerable time ^b
	Ground water	Twelve (12) months	Two (2) times in a year taken as follows: Sample during one (1) month of the vulnerable time ^b and during one (1) month five (5) to seven (7) months earlier or later ^c
Microbiological	Surface and ground water	Twelve (12) months	Six (6) times in a year taken as follows: Select either the first, second, or third month of a quarter and sample in that same month of each of four (4) quarters, and sample an additional two (2) months during the warmest (vulnerable) quarter of the year. ^d

^a “Select either the first, second, or third month of a quarter and sample in that same month of each of four consecutive quarters” means that the system must monitor during each of the four months of either: January, April, July, October; or February, May, August, November; or March, June, September, December.

^b “Vulnerable time” means May 1 through July 31, unless the State or EPA informs the system that it has selected a different time period for sampling as its vulnerable time.

^c “Sample during one month of the vulnerable time and during one month five to seven months earlier or later” means, for example, that if the system selects May as its “vulnerable time” month to sample, then one month five to seven months earlier would be either October, November, or December of the preceding year, and one month five to seven months later would be either, October, November, or December of the same year.

^d This means that the system must monitor during each of the six months of either: January, April, July, August, September, October, or February, May, July, August, September, November, or March, June, July, August, September, December; unless the State or EPA informs the system that a different vulnerable quarter has been selected for it.

Sites selected for *Aeromonas* samples may be, and should be, where possible, the same locations identified for other drinking water contaminants which may occur under similar conditions. For example, samples for coliform indicator bacteria, as described in 40 CFR §141.21, are taken from a variety of locations through the distribution system. More specifically, some of these samples are from locations where the disinfectant residual is representative of the distribution system and has not significantly declined. Locations specified in the sample plan for coliform bacteria that meet this description could be used for the *Aeromonas* midpoint sample. Additionally, *Aeromonas* samples must be taken from two locations in the distribution system where the disinfectant residual is expected to be low. This is similar to total trihalomethane (TTHM) sampling points, as described in 63 FR 69468, the Disinfectants and Disinfection Byproducts Rule, and 40 CFR §141.30. These sample locations are at distal parts of the distribution system (taking care to avoid disinfectant booster

stations) or dead ends, or locations previously determined to have the lowest disinfectant residual for systems which disinfect.

5.2 General Quality Control Requirements

Sampling and laboratory quality control requirements promote proper sample collection and analyses to ensure that the EPA obtains the most reliable monitoring data possible. This is particularly important since UCMR data will only be collected from approximately 3,600 systems (about 2,800 large systems and 800 small systems). To ensure reliable data, EPA is specifying the use of specific analytical methods that are currently available for monitoring (§141.40(a)(3), Table 1). While many of these methods are routinely used by commercial and PWS laboratories (including some that are currently used for compliance monitoring), they have not necessarily been used routinely for the contaminants on the UCMR (1999) List. As shown in Table 7, methods other than those that EPA has developed may be approved for use, but quality control procedures must also be followed as specified in §141.40(a)(3),(4) and (5), and §141.40 Appendix A (64 FR 50556).

Table 7 lists the approved analytical methods for UCMR (1999) List 1 contaminants, and Table 8 lists analytical methods for List 2 contaminants. More detailed information on these analytical methods can be found in the *UCMR (1999) List 1 and List 2 Chemical Analytical Methods QC Manual* (EPA 815-R-01-028). Once List 3 methods are fully developed, reviewed, and refined, EPA will provide further guidance for the List 3 contaminants.

Table 7. Unregulated Contaminant Monitoring Regulation (1999) List 1					
1-Contaminant	2-CAS registry number	3-Analytical methods	4-Minimum reporting level	5-Sampling location	6-Period during which monitoring to be completed
List 1 - Assessment Monitoring Chemical Contaminants					
2,4-dinitrotoluene	121-14-2	EPA Method 525.2 ^a	2 µg/L ^e	EPTDS ^f	2001-2003
2,6-dinitrotoluene	606-20-2	EPA Method 525.2 ^a	2 µg/L ^e	EPTDS ^f	2001-2003
Acetochlor	34256-82-1	EPA Method 525.2 ^a	2 µg/L ^o	EPTDS ^f	2001-2003
DCPA mono-acid degradate ^h	887-54-7	EPA Method 515.1 ^a EPA Method 515.2 ^a EPA Method 515.3 ^{i,j} EPA Method 515.4 ^k D5317-93 ^b AOAC 992.32 ^c	1 µg/L ^e	EPTDS ^f	2001-2003
DCPA di-acid degradate ^h	2136-79-0	EPA Method 515.1 ^a EPA Method 515.2 ^a EPA Method 515.3 ^{i,j} EPA Method 515.4 ^k D5317-93 ^b AOAC 992.32 ^c	1 µg/L ^e	EPTDS ^f	2001-2003

Table 7. Unregulated Contaminant Monitoring Regulation (1999) List 1					
1-Contaminant	2-CAS registry number	3-Analytical methods	4-Minimum reporting level	5-Sampling location	6-Period during which monitoring to be completed
List 1 - Assessment Monitoring Chemical Contaminants					
4,4'-DDE	72-55-9	EPA Method 508 ^a EPA Method 508.1 ^a EPA Method 525.2 ^a D5812-96 ^b AOAC 990.06 ^c	0.8 µg/L ^e	EPTDS ^f	2001-2003
EPTC	759-94-4	EPA Method 507 ^a EPA Method 525.2 ^a D5475-93 ^b AOAC 991.07 ^c	1 µg/L ^e	EPTDS ^f	2001-2003
Molinate	2212-67-1	EPA Method 507 ^a EPA Method 525.2 ^a D5475-93 ^b AOAC 991.07 ^c	0.9 µg/L ^e	EPTDS ^f	2001-2003
MTBE	1634-04-4	EPA Method 502.2 ^{a,n} SM 6200C ^{d,n} EPA Method 524.2 ^a D5790-95 ^b SM 6210D ^d SM 6200B ^d	5 µg/L ^g	EPTDS ^f	2001-2003
Nitrobenzene	98-95-3	EPA Method 524.2 ^a D5790-95 ^b SM6210D ^d SM6200B ^d	10 µg/L ^g	EPTDS ^f	2001-2003
Perchlorate	14797-73-0	EPA Method 314.0 ^l	4 µg/L ^m	EPTDS ^f	2001-2003
Terbacil	5902-51-2	EPA Method 507 ^a EPA Method 525.2 ^a D5475-93 ^b AOAC 991.07 ^c	2 µg/L ^e	EPTDS ^f	2001-2003

Column headings are:

1-Chemical or microbiological contaminant: the name of the contaminants to be analyzed.

2-CAS (Chemical Abstract Service Number) Registry Number or Identification Number: a unique number identifying the chemical contaminants.

3-Analytical Methods: method numbers identifying the methods that must be used to test the contaminants.

4-Minimum Reporting Level: the value and unit of measure at or above which the concentration or density of the contaminant must be measured using the Approved Analytical Methods.

5-Sampling Location: the locations within a PWS at which samples must be collected.

6- Years During Which Monitoring to Be Completed: The years during which the sampling and testing are to occur for the indicated contaminant.

The procedures shall be done in accordance with the documents listed next in these footnotes. The incorporation by reference of the following documents listed in footnotes b-d and l was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Copies of the documents may be obtained from the following sources. Information regarding obtaining these documents can be obtained from the Safe Drinking Water Hotline at 800-426-4791. Documents may be inspected at EPA's Drinking Water Docket, 401 M Street, SW., Washington, DC 20460 (Telephone: 202-260-3027); or at the Office of Federal Register, 800 North Capitol Street, NW., Suite 700, Washington, DC.

^a The version of the EPA methods which you must follow for this Rule are listed at §141.24(e).

^b Annual Book of ASTM Standards, 1996, 1998 and 1999 Vol. 11.02, American Society for Testing and Materials. Method D5812-96, "Standard Test Method for Determination of Organochlorine Pesticides in Water by Capillary Column Gas Chromatography", is located in the Annual Book of ASTM Standards, 1998 and 1999, Vol. 11.02. Methods D5790-95, "Standard Test Method for Measurement of Purgeable Organic Compounds in Water by Capillary Column Gas Chromatography/Mass Spectrometry"; D5475-93, "Standard Test Method for Nitrogen- and Phosphorous-Containing Pesticides in Water by Gas Chromatography with a Nitrogen-Phosphorous Detector"; and D5317-93, "Standard Test Method for Determination of Chlorinated Organic Acid Compounds in Water by Gas Chromatography with an Electron Capture Detector" are located in the Annual Book of ASTM Standards, 1996 and 1998, Vol 11.02. Copies may be obtained from the American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428.

^c Official Methods of Analysis of AOAC (Association of Official Analytical Chemist) International, Sixteenth Edition, 4th Revision, 1998, Volume I, AOAC International, First Union National Bank Lockbox, PO Box 75198, Baltimore, MD 21275-5198. 800-379-2622.

^d SM 6210 D is only found in the 18th and 19th editions of Standard Methods for the Examination of Water and Wastewater, 1992 and 1995, American Public Health Association; either edition may be used. SM 6200 B and 6200 C are only found in the 20th edition of Standard Methods for the Examination of Water and Wastewater, 1998. Copies may be obtained from the American Public Health Association, 1015 Fifteenth Street NW, Washington, DC 20005.

^e Minimum Reporting Level determined by multiplying by 10 the least sensitive method's detection limit (detection limit=standard deviation times the Student's t value for 99% confidence level with n-1 degrees of freedom), or when available, multiplying by 5 the least sensitive method's estimated detection limit (where the estimated detection limit equals the concentration of compound yielding approximately a 5 to 1 signal to noise ratio or the calculated detection limit, whichever is greater).

^f Entry Points to the Distribution System (EPTDS), after treatment, representing each non-emergency water source in use over the 12-month period of monitoring: this only includes entry points for sources in operation during the months in which sampling is to occur. Sampling must occur at the EPTDS, unless the State has specified other sampling points that are used for compliance monitoring 40 CFR 141.24 (f)(1), (2), and (3). See 40 CFR 141.40(a)(5)(ii)(C) for a complete explanation of requirements, including the use of source (raw) water sampling points.

^g Minimum Reporting Levels (MRL) for Volatile Organic Compounds (VOC) determined by multiplying either the published detection limit or 0.5 µg/L times 10, whichever is greater. The detection limit of 0.5 µg/L (0.0005 mg/L) was selected to conform to VOC detection limit requirements of 40 CFR 141.24(f)(17)(E).

^h The approved methods do not allow for the identification and quantitation of the individual acids. The single analytical result obtained should be reported as total DCPA mono- and di-acid degradates.

ⁱ Method 515.3, "Determination of Chlorinated Acids in Drinking Water by Liquid-Liquid Extraction, Derivatization and Gas Chromatography with Electron Capture Detection," Revision 1.0 July 1996. EPA 815-R-00-014, "Methods for the Determination of Organic and Inorganic Compounds in Drinking Water, Volume 1," August 2000. Available from the National Technical Information Service, NTIS PB2000-106981, U.S. Department of Commerce, 5285 Port Royal Road, Springfield, Virginia 22161. The toll free number is 800-553-6847. Alternatively, the method can be assessed and downloaded directly on-line at www.epa.gov/safewater/methods/sourcalt.html.

^j Since EPA Method 515.3 does not include a solvent wash step following hydrolysis, the parent DCPA is not removed prior to analysis, therefore, only non-detect data may be reported using Method 515.3. All samples with results above the MRL must be analyzed by one of the other approved methods.

^k EPA Method 515.4, "Determination of Chlorinated Acids in Drinking Water by Liquid-Liquid Microextraction, Derivatization and Fast Gas Chromatography with Electron Capture Detection," Revision 1.0, April 2000, EPA 815/B-00/001. Available by requesting a copy from the EPA Safe Drinking Water Hotline within the United States at 800-426-4791 (Hours are Monday through Friday, excluding federal holidays, from 9 a.m. to 5:30 p.m. Eastern Time). Alternatively, the method can be assessed and downloaded directly on-line at www.epa.gov/safewater/methods/sourcalt.html.

¹ Method 314.0, "Determination of Perchlorate in Drinking Water Using Ion Chromatography," Revision 1.0, EPA 815-B-99-003, November 1999. EPA 815-R-00-014, "Methods for the Determination of Organic and Inorganic Compounds in Drinking Water, Volume 1," August 2000. Available from the National Technical Information Service, NTIS PB2000-106981, U.S. Department of Commerce, 5285 Port Royal Road, Springfield, Virginia 22161. The toll free number is 800-553-6847. Alternatively, the method can be assessed and downloaded directly on-line at www.epa.gov/safewater/methods/sourcalt.html.

^m MRL was established at a concentration, which is at least 1/4th the lowest known adverse health concentration, at which acceptable precision and accuracy has been demonstrated in spiked matrix samples.

ⁿ Sample preservation techniques and holding times specified in EPA Method 524.2 must be used by laboratories using either EPA Method 502.2 or Standard Methods 6200C.

Table 8. Unregulated Contaminant Monitoring Regulation (1999) List 2					
1-Contaminant	2-CAS Registry Number	3-Analytical Methods	4-Minimum Reporting Level	5-Sampling Location	6-Period During Which Monitoring to Be Completed
List 2 - Screening Survey – Chemical Contaminants To Be Sampled After Notice of Analytical Methods Availability					
1,2-diphenylhydrazine	122-66-7	EPA Method 526 ^a	0.5 µg/L	EPTDS ^e	2001 - Selected Systems serving <10,000 persons; 2002 - Selected systems serving > 10,000 persons.
2-methyl-phenol	95-48-7	EPA Method 528 ^b	1 µg/L ^f	EPTDS ^e	same as above.
2,4-dichlorophenol	120-83-2	EPA Method 528 ^b	1 µg/L ^f	EPTDS ^e	same as above.
2,4-dinitrophenol	51-28-5	EPA Method 528 ^b	5 µg/L ^f	EPTDS ^e	same as above.
2,4,6-trichlorophenol	88-06-2	EPA Method 528 ^b	1 µg/L ^f	EPTDS ^e	same as above.
Alachlor ESA	Reserved ^e	Reserved ^d	Reserved ^d	Reserved ^d	Reserved ^d
Diazinon	333-41-5	EPA Method 526 ^a	0.5 µg/L ^f	EPTDS ^e	2001 - Selected Systems serving <10,000 persons; 2002 - Selected systems serving > 10,000 persons.
Disulfoton	298-04-4	EPA Method 526 ^a	0.5 µg/L ^f	EPTDS ^e	same as above.
Diuron	330-54-1	EPA Method 532 ^c	1 µg/L ^f	EPTDS ^e	same as above.
Fonofos	944-22-9	EPA Method 526 ^a	0.5 µg/L ^f	EPTDS ^e	same as above.
Linuron	330-55-2	EPA Method 532 ^c	1 µg/L ^f	EPTDS ^e	same as above.

Table 8. Unregulated Contaminant Monitoring Regulation (1999) List 2					
1-Contaminant	2-CAS Registry Number	3-Analytical Methods	4-Minimum Reporting Level	5-Sampling Location	6-Period During Which Monitoring to Be Completed
List 2 - Screening Survey – Chemical Contaminants To Be Sampled After Notice of Analytical Methods Availability					
Nitrobenzene	98-95-3	EPA Method 526 ^a	0.5 µg/L ^g	EPTDS ^e	same as above.
Prometon	1610-18-0	EPA Method 526 ^a	0.5 µg/L ^f	EPTDS ^e	same as above.
RDX	121-82-4	Reserved ^d	Reserved ^d	Reserved ^d	Reserved ^d
Terbufos	13071-79-9	EPA Method 526 ^a	0.5 µg/L ^{f,k}	EPTDS ^e	2001 - Selected Systems serving ≤10,000 persons; 2002 - Selected systems serving > 10,000 persons.
List 2 - Screening Survey – Microbiological Contaminants To Be Sampled After Notice of Analytical Methods Availability					
<i>Aeromonas</i>	NA	Reserved ^d	Reserved ^d	Distribution System ^g	2003 ^h

Column headings are:

1 - Chemical or microbiological contaminant: the name of the contaminants to be analyzed.

2 - CAS (Chemical Abstract Service Number) Registry Number or Identification Number: a unique number identifying the chemical contaminants.

3 - Analytical Methods: method numbers identifying the methods that must be used to test the contaminants.

4 - Minimum Reporting Level: the value and unit of measure at or above which the concentration or density of the contaminant must be measured using the Approved Analytical Methods.

5 - Sampling Location: the locations within a PWS at which samples must be collected.

6 - Years During Which Monitoring to be Completed: the years during which the sampling and testing are to occur for the indicated contaminant.

The procedures shall be done in accordance with the documents listed next in these footnotes. The incorporation by reference of the following documents listed in footnotes a-c, was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Copies of the documents may be obtained from the following sources. Information regarding obtaining these documents can be obtained from the Safe Drinking Water Hotline at 800-426-4791. Copies of the documents may be obtained from the sources listed in these footnotes. Information regarding obtaining these documents can be obtained from the Safe Drinking Water Hotline at 800-426-4791. Documents may be inspected at EPA's Drinking Water Docket, 401 M Street, SW., Washington, DC 20460 (Telephone: 202-260-3027); or at the Office of Federal Register, 800 North Capitol Street, NW., Suite 700, Washington, DC.

^a EPA Method 526, "Determination of Selected Semivolatile Organic Compounds in Drinking Water by Solid Phase Extraction and Capillary Column Gas Chromatography/Mass Spectrometry (GC/MS)," Revision 1.0, June 2000. EPA 815-R-00-014, "Methods for the Determination of Organic and Inorganic Compounds in Drinking Water, Volume 1," August 2000. Available from the National Technical Information Service, NTIS PB2000-106981, U.S. Department of Commerce, 5285 Port Royal Road, Springfield, Virginia 22161. The toll free number is 800-553-6847.

Alternatively, the method can be assessed and downloaded directly on-line at www.epa.gov/safewater/methods/sourcalt.html.

^b EPA Method 528, "Determination of Phenols in Drinking Water by Solid Phase Extraction and Capillary Column Gas Chromatography/Mass Spectrometry (GC/MS)," Revision 1.0, April 2000. EPA 815-R-00-014, "Methods for the Determination of Organic and Inorganic Compounds in Drinking Water, Volume 1," August 2000. Available from the National Technical Information Service, NTIS PB2000-106981, U.S. Department of Commerce, 5285 Port Royal Road, Springfield, Virginia 22161. The toll free number is 800-553-6847. Alternatively, the method can be assessed and downloaded directly on-line at www.epa.gov/nerlcwww/ordmeth.htm.

^c EPA Method 532, "Determination of Phenylurea Compounds in Drinking Water by Solid Phase Extraction and High Performance Liquid Chromatography with UV Detection," Revision 1.0, June 2000. EPA 815-R-00-014, "Methods for the determination of Organic and Inorganic Compounds in Drinking Water, Volume 1," August 2000. Available from the National Technical Information Service, NTIS PB2000-106981, U.S. Department of Commerce, 5285 Port Royal Road, Springfield, Virginia 22161. The toll free number is 800-553-6847. Alternatively, the method can be assessed and downloaded directly on-line at www.epa.gov/safewater/methods/sourcalt.html.

^d To be specified at a later time.

^e Entry Points to the Distribution System (EPTDS), after treatment, representing each non-emergency water source in use over the 12-month period of monitoring: this only includes entry points for sources in operation during the months in which sampling is to occur. Sampling must occur at the EPTDS, source water sampling points are not permitted for List 2 contaminant monitoring.

^f Minimum Reporting Level represents the value of the lowest concentration precision and accuracy determination made during methods development and documented in the method. If method options are permitted, the concentration used was for the least sensitive option.

^g Three samples must be taken from the distribution system, which is owned or controlled by the selected PWS. The sample locations must include one sample from a point (MD from §141.35 (d)(3), Table 1) where the disinfectant residual is representative of the distribution system. This sample location may be selected from sample locations which have been previously identified for samples to be analyzed for coliform indicator bacteria. Coliform sample locations encompass a variety of sites including midpoint samples which may contain a disinfectant residual that is typical of the system. Coliform sample locations are described in 40 CFR 141.21. This same approach must be used for the *Aeromonas* midpoint sample where the disinfectant residual would not have declined and would be typical for the distribution system. Additionally, two samples must be taken from two different locations: the distal or dead-end location in the distribution system (MR from §141.35 (d)(3), Table 1), avoiding disinfectant booster stations, and from a location where previous determinations have indicated the lowest disinfectant residual in the distribution system (LD from §141.35(d)(3), Table 1). If these two locations of distal and low disinfectant residual sites coincide, then the second sample must be taken at location between the MD and MR sites. Locations in the distribution system where the disinfectant residual is expected to be low are similar to TTHM sampling points. Sampling locations for TTHMs are described in 63 FR 69468.

^h This monitoring period is contingent upon promulgation of the analytical method and minimum reporting level.

5.3 Quality Control Requirements for Sample Collection

Procedures for sample collection under the UCMR are contaminant- and method-specific. Detailed sample collection instructions for Assessment Monitoring contaminants can be found in the *Small Systems Guidance – Unregulated Contaminant Monitoring Regulation Guidance for Operators of Public Water Systems Serving 10,000 or Fewer People* (EPA 815-R-01-002) – for small PWSs, and in the *UCMR (1999) List 1 and List 2 Chemical Analytical Methods QC Manual* (EPA 815-R-01-028), for large systems and laboratories.

Both large and small PWSs must ensure that samples are collected early enough in the day to allow time for overnight delivery to the laboratories, since some samples must be processed within 30 hours of collection (§141.40(a)(5)(i)(a)). Samples may not be composited (i.e., combined, mixed, or blended). Each sample must be collected, preserved (if applicable), and tested separately (§141.40(a)(5)(i)(b)).

5.3.1 Quality Control Requirements for Sample Collection: Additional Requirements Specific to Large Systems

If sample collection at large systems is not performed according to the required instructions and procedures for each contaminant and analytical method, the system owner/operator will be required to resample following the required method instructions and procedures (§141.40(a)(5)(ii)(F) and (iii)(C)). If laboratory or shipping problems cause the loss of a sample, then all efforts should be made to replace that sample at the earliest possible time (preferably in the same month that the original sample was collected). If resampling in the same month is not possible, then systems should collect the samples in the same quarter, so that monitoring schedules do not need to change. The only case where monitoring schedules may change is if all the samples for the first sampling period are lost or damaged. In this case, the system may monitor in another month, and reschedule sampling based on that starting month.

Large system owners/operators are responsible for arranging contaminant analysis for Assessment Monitoring and Screening Surveys at an approved laboratory. For the Pre-Screen Testing analyses, the EPA will provide a list of laboratories that may be used when pre-screen testing is required.

The large system owner/operator should consult with the laboratory conducting the analytical work regarding the sampling protocol (§141.40(a)(5)(iii)(F)). Laboratories may require collection and submission of some duplicate samples as part of their internal quality control program, or for other practical considerations in the event that sample containers are lost, broken, or not properly sealed or cooled.

5.3.2 Quality Control Requirements for Sample Collection: Additional Requirements Specific to Small Systems

The State or EPA may notify small systems of their sampling requirements and schedule. If sampling is not performed according to the instructions or procedures for each contaminant and its method, then the owner/operator must notify the State or EPA of the sampling deviations. The sampling deviations should be included in the sample reporting forms that are sent back to the laboratory with the samples. The PWS must resample as soon as instructions are received from the laboratory or the EPA contractor (§141.40(a)(5)(iii)(C)).

The EPA contractor will send a sample collection kit to all small systems, which will include: an insulated sample shipping container or containers; all required sampling bottles; freeze packs to keep samples cool in transit back to the laboratory; any chemicals needed to dechlorinate and/or preserve samples; a pre-paid return shipping docket; sample collection data forms; and any additional instructions or materials needed for sample collection, dechlorination, and preservation. If any of the materials listed in the kit instructions are not included or arrive damaged, the system must notify the contractor prior to use of the sample collection kit (§141.40(a)(5)(iii)(D)). Each kit must be stored and maintained in a secure place until used for sampling (§141.40(a)(5)(iii)(D)). Note that cold packs must be frozen prior to sample collection so that the collected samples can be kept cool when shipped to the laboratory (§141.40(a)(5)(iii)(E)).

Instructions provided with the kit will describe the proper procedures for use of containers, sample collection, dechlorination and/or preservation of the samples, and sealing and preparing the samples and containers for shipment. EPA will use a random process to select some systems in State Monitoring Plans (SMPs) that will be requested to collect duplicate samples for quality control.

Approximately 10% of samples collected for small systems will be collected in duplicate. Systems selected for this quality control sampling will receive two sample collection kits. The same required sampling procedures must be used for both the original and the duplicate sample kits (§141.40(a)(5)(iii) (D) and (F)). These systems will not incur additional costs since EPA is paying for small system testing.

5.3.3 Quality Control Requirements for Laboratories

Systems must ensure that laboratories providing services in support of their monitoring are currently certified to perform compliance monitoring, as applicable to those analytical methods which are approved for UCMR Assessment Monitoring and Screening Surveys (§141.40(a)(5)(ii)(G)). They must also ensure that the laboratory performing perchlorate and *Aeromonas* analyses has passed the EPA Performance Evaluation requirements. These methods specify quality control procedures that must be followed to ensure reliable data. Detailed monitoring quality control procedures are discussed in the *UCMR (1999) List 1 and List 2 Chemical Analytical Methods QC Manual (QC Manual, EPA 815-R-01-028)*.

Quality control procedures and the frequency of quality control testing vary among the different analytical methods used for laboratory analysis of the UCMR contaminants. Many methods specified in the UCMR provide criteria to be used in evaluating and accepting laboratory performance based on related quality control data. It is imperative that laboratories adhere to the specified quality control requirements. UCMR monitoring data will not be accepted by EPA if the applicable quality control requirements are not met. If the UCMR quality control requirements are not met, then the system will be out of compliance with respect to the UCMR. The laboratory should ensure that PWSs resample when quality control requirements are not met. Detailed information on all laboratory quality control requirements are specified in Appendix A of §141.40 and the *QC Manual*.

5.3.4 Additional Quality Controls

Samples for which the methods specify storage at approximately 4°C must arrive at the laboratory packed in coolers with ice or frozen cold packs. If there is no visible ice or the cold packs are completely thawed, the laboratory should report the conditions to the water system. Samples should not be analyzed if the shipping temperature was not maintained at 4°C ($\pm 2^\circ$). The laboratory must also invalidate samples that were collected in improper sampling containers (e.g., plastic bottles, where the method requirements specify glass) or that were improperly filled (e.g., half-filled bottles for samples that are required to be completely filled with no air or bubbles). New water samples should be collected to replace these samples. If resampling cannot be performed, then the water system must indicate in the report to EPA that the samples were invalidated because of a shipment, storage, or sampling problem, etc., and no data should be reported.

In addition, the laboratory must analyze each sample within the required holding time (§141.40 Appendix A (1)). When appropriate, EPA standardized the holding times across analytical methods for the same analyte group, except for Perchlorate, which has a holding time of approximately 40 hours. Please refer to the *QC Manual* (EPA 815-R-01-028) for more detailed information on sample holding times. If a UCMR sample is not extracted or analyzed within the specified holding time, then the data for the sample should not be reported. The laboratory should indicate to the water system that the sample was invalidated because of a holding time problem, and the system should collect another sample. This information would then be reported when the system submits its report for that sampling period.

6. UCMR Reporting Requirements

6.1 Data Elements

Large systems are required by the UCMR to ensure that the information listed in Table 9 is reported to the EPA within 30 days following the month in which laboratory results were received (§140.35(d)). Laboratories will post UCMR results for their client public water systems by uploading or entering the data elements using EPA's electronic reporting system. Analytical results must be approved by PWSs and then released to the EPA as officially reported UCMR data.

Small systems should check that the pre-printed information provided on the sampling forms is correct. This information must be reported so that each sampling point used for UCMR sampling can be associated with the facility(ies) in use at the time the sampling occurred (§141.40(a)(5)(iii)(E)). In addition, systems must provide points of contact for: a PWS technical person who is responsible for the technical aspects of UCMR activities, such as details concerning sampling and reporting; an official UCMR spokesperson from the PWS; and a laboratory contact person who is able to address questions concerning the analyses performed by the laboratory (§141.40(d)(1)). The laboratory will post the monitoring data to EPA's internet-based SDWARS/UCMR (Safe Drinking Water Accession and Review System) reporting system (§141.35(e) and (f)).

<i>Data Element</i>	<i>Definition</i>
1. Public Water System Identification Number	The code used to identify each PWS. The code begins with the standard two-character postal State abbreviation; the remaining seven characters are unique to each PWS.
2. Public Water System Facility Identification Number - Sampling Point Identification Number and Sampling Point Type Identification	<p>The Sampling point identification number and sampling point type identification must either be static or traceable to previous numbers and type identifications throughout the period of unregulated contaminant monitoring. The Sampling point identification number is a three-part alphanumeric designation, made up of:</p> <p>a. The Public Water System Facility Identification Number is an identification number established by the State, or at the State's discretion the PWS, that is unique to the PWS for an intake for each source of water, a treatment plant, a distribution system, or any other facility associated with water treatment or delivery and provides for the relationship of facilities to each other to be maintained;</p> <p>b. The Sampling Point Identification Number is an identification number established by the State, or at the State's discretion the PWS, that is unique to each PWS facility that identifies the specific sampling point and allows the relationship of the sampling point to other facilities to be maintained; and</p> <p>c. Sampling Point Type Identification is one of following:</p> <p>SR - Untreated water collected at the source of the water system facility.</p>

Table 9. UCMR Reporting Requirements	
<i>Data Element</i>	<i>Definition</i>
	<p>EP - Entry point to the distribution system.</p> <p>MD - midpoint in the distribution system where the disinfectant residual would be expected to be typical for the system such as the location for sampling coliform indicator bacteria as described in 40 CFR 141.21.</p> <p>MR - point of maximum retention is the point located the furthest from the entry point to the distribution system which is approved by the State for trihalomethane (THM) (disinfectant byproducts (DBP)) and/or total coliform sampling.</p> <p>LD - location in the distribution system where the disinfectant residual is the lowest which is approved by the State for THM (DBP) and/or total coliform sampling.</p>
3. Sample Collection Date	The date the sample is collected reported as 4-digit year, 2-digit month, and 2-digit day.
4. Sample Identification Number	An alphanumeric value of up to 15 characters assigned by the laboratory to uniquely identify containers or groups of containers containing water samples collected at the same time and sampling point.
5. Contaminant/Parameter	The unregulated contaminant or water quality parameter for which the sample is being analyzed.
6. Analytical Results - Sign	<p>An alphanumeric value indicating whether the sample analysis result was:</p> <p>a. (<) "less than" means the contaminant was not detected or was detected at a level "less than" the minimum reporting level (MRL).</p> <p>b. (=) "equal to" means the contaminant was detected at a level "equal to" the value reported in "Analytical Result - Value."</p>
7. Analytical Result - Value	The actual numeric value of the analysis for chemical and microbiological results, or the MRL if the analytical result is less than the contaminant's MRL
8. Analytical Result - Unit of Measure	The unit of measurement for the analytical results reported. [e.g., micrograms per liter, ($\mu\text{g/L}$); colony-forming units per 100 milliliter, (CFU/100 mL), etc.]
9. Analytical Method Number	The identification number of the analytical method used.
10. Sample Analysis Type	<p>The type of sample collected. Permitted values include:</p> <p>a. RFS - Raw field sample - untreated sample collected and submitted for analysis under this rule.</p> <p>b. RDS - Raw duplicate field sample - untreated field sample duplicate</p>

Table 9. UCMR Reporting Requirements	
<i>Data Element</i>	<i>Definition</i>
	<p>collected at the same time and place as the raw field sample and submitted for analysis under this rule.</p> <p>c. TFS - Treated field sample - treated sample collected and submitted for analysis under this rule.</p> <p>d. TDS - Treated duplicate field sample - treated field sample duplicate collected at the same time and place as the treated field sample and submitted for analysis under this rule.</p>
11. Sample Batch Identification Number	<p>The sample batch identification number consists of three parts:</p> <p>a. Up to a 10-character laboratory identification code assigned by EPA;</p> <p>b. Up to a 15-character code assigned by the laboratory to uniquely identify each extraction or analysis batch.</p> <p>c. The date that the samples contained in each extraction batch extracted or in an analysis batch were analyzed, reported as an 8-digit number in the form 4-digit year, 2-digit month, and 2-digit day.</p>
12. Minimum Reporting Level	MRL refers to the lowest concentration of an analyte that may be reported. Unregulated contaminant monitoring MRLs are established in §141.40 monitoring requirements for unregulated contaminants.
13. Minimum Reporting Level Unit of Measure	The unit of measure to express the concentration, count, or other value of a contaminant level for the Minimum Reporting Level reported. (e.g., µg/L, colony forming units/100 mL (CFU/100 mL), etc.).
14. Analytical Precision	<p>Precision is the degree of agreement between two repeated measurements and is monitored through the use of duplicate spiked samples. For purposes of the Unregulated Contaminant Monitoring Regulation (UCMR), Analytical Precision is defined as the relative percent difference (RPD) between spiked matrix duplicates. The RPD for the spiked matrix duplicates analyzed in the same batch of samples as the analytical result being reported is to be entered in this field. Precision is calculated as the RPD of spiked matrix duplicates from the mean using:</p> $\text{RPD} = \text{absolute value of } [(X_1 - X_2) / \{(X_1 + X_2)/2\}] \times 100\%$ <p>where:</p> <p>X_1 is the concentration observed in spiked field sample minus the concentration observed in unspiked field sample</p> <p>X_2 is the concentration observed in duplicate spiked field sample minus the concentration observed in unspiked field sample</p>
15. Analytical Accuracy	Accuracy describes how close a result is to the true value measured

Table 9. UCMR Reporting Requirements	
<i>Data Element</i>	<i>Definition</i>
	through the use of spiked field samples. For purposes of unregulated contaminant monitoring, accuracy is defined as the percent recovery of the contaminant in the spiked matrix sample analyzed in the same analytical batch as the sample result being reported and calculated using: % recovery = [(amt. found in spiked sample - amt. found in sample) / amt. spiked] x 100%
16. Spiking Concentration	The concentration of method analytes added to a sample to be analyzed for calculating analytical precision and accuracy where the value reported use the same unit of measure reported for Analytical Results
17. Presence/Absence	Reserved

6.2 Electronic Reporting and Data Review

The UCMR requires that all data be reported electronically to EPA, unless a request is received from the PWS. Further guidance and tutorials is provided in the *UCMR Reporting Guidance* (EPA 815-R-01-029) and in the forthcoming *Implementation Guide for UCMR*. The UCMR provides for electronic reporting of UCMR data directly from laboratories on behalf of systems. This is intended to facilitate “one-entry” of data, reducing reporting errors and reducing the time involved in investigating, checking and correcting errors at all levels (laboratory, system, State, and EPA). The reporting process will be secure. PWSs and laboratories will have to register as users of EPA’s Central Data Exchange (CDX) before gaining access to EPA’s electronic reporting Web site. Registration began in March 2001. Systems will have to approve their data before it is available to EPA.

In general, a PWS can fulfill its responsibilities in one of two ways: (1) it can instruct the laboratory to post the monitoring results to SDWARS/UCMR database through the CDX, so the PWS can review the data on line and electronically indicate its approval to make the data available to EPA; or (2) it can elect to receive a hard copy of the monitoring results for review and then indicate its approval to the laboratory to upload the data to EPA (however, the PWS, or its representative, will still have to provide electronic approval within SDWARS/UCMR, to provide EPA access to the data). The PWS must also submit the results to the State, and is responsible for ensuring compliance with any other State reporting requirements.

EPA is developing several options for the electronic reporting by laboratories, including the capability to upload data in electronic batches or individually using a Web interface where data can be keyed in using “web forms”. Laboratories that have good electronic reporting capabilities and want or need to upload large batches of data have two options:

- *Standard flat file format* – such as tab or comma delimited files, or
- *New XML or extensible mark-up language format* – protocol and format are currently being finalized, and may be available through CDX.

Large systems are responsible for reviewing analytical results and reporting the results to the EPA (with a copy to the State) within 30 days following the month in which the results are received from the laboratory as specified in 40 CFR §141.35. However, for small systems, laboratories will report all analytical results to EPA, and the EPA contractor will review all sampling results. For example, if analytical results for samples that were collected during October were not received back from the laboratory until November, the latest allowable reporting date would be December 30. All systems are responsible for ensuring timely reporting within, or shortly following the monitoring period.

EPA has made an exception to the normal reporting schedule for the first rounds of monitoring in 2001 to allow for the readiness of the electronic reporting system. Systems which receive results prior to January 1, 2002 will be required to report their data by April 30, 2002. EPA will then hold the data for 60 days to allow for quality control review and for review by systems and States. EPA will then place the data in the National Drinking Water Contaminant Occurrence Database (NCOD) at the time of the next database update.

For small systems, EPA will send copies of monitoring results to the systems and the State once EPA receives and validates the results from the contract laboratories. Small systems are still responsible for enduring that their State receives a copy of the results. Participating small systems will have 30 days to review and comment on the data. Systems and States will have an additional 60 days to review the data before results are reported to the NCOD.

Since States will have electronic access to the monitoring results for systems in their State, they may allow systems to forgo the requirement to provide them with a copy of the results. Systems should check with their States for any additional reporting requirements beyond the scope of the UCMR requirements (i.e., some States may require immediate reporting of monitoring results which may pose an imminent danger to human health). EPA encouraged States to notify PWSs of additional State-specific reporting requirements when they notify PWSs of their responsibilities under the UCMR. Systems that do not receive direction from their States should report results to their State Agency concurrent with reporting results to EPA through the electronic reporting system. For small systems in States that require immediate reporting of contaminants detected, EPA will report results to the system and the State after EPA receives and validates the results from the laboratory. However, the system is still responsible for enduring that the State receives a copy of the results. EPA is also not responsible for identifying all of the States that require immediate reporting of detected contaminants.

6.3 Public Notification

CWSs must report UCMR results through the Consumer Confidence Report (CCR) Rule, published on August 19, 1998 (63 FR 44511), as required by §141.153(d). CWSs must report UCMR results when any of the UCMR contaminants are detected. CCRs must be sent to all billing customers each year by July 1. A system may briefly explain in the CCR why it is monitoring for unregulated contaminants. The explanation may read as follows:

Unregulated contaminants are those for which EPA has not established drinking water standards. The purpose of unregulated contaminant monitoring is to assist EPA in determining the occurrence of unregulated contaminants in drinking water and whether future regulation is warranted.

For all PWSs that are subject to the Rule, UCMR monitoring results will be made available to the public through the requirements of the Public Notification Rule (May 4, 2000 at 65 FR 25982). All

PWSs are required to notify the public annually of the availability of unregulated contaminant analytical results. Failure to monitor for unregulated contaminants, as required through the UCMR, will also be reportable under the Public Notification Rule. Because the effective date of the revised public notification rule differs by State, PWS owners and operators should check with their State drinking water agency to determine the applicable public notice requirements. Detailed information on these reporting requirements can be found in the documents *Preparing Your Drinking Water Consumer Confidence Report* (EPA 816-R-99-002) and *Public Notification Handbook* (EPA 916-R-00-010). Both of these documents are available on the Web at www.epa.gov/safewater.

The results that will be reported through the CCR and Public Notification Rules should be based on the same monitoring data that the States and EPA will receive under the UCMR. Information received by EPA will be available to the public via NCOD. Unregulated contaminants not on the UCMR List would not be required to be reported under the CCR. However, any emerging contaminants of local or State concern may be voluntarily reported to the NCOD to assist EPA in determining if these contaminants should be considered for establishing health-based standards or advisories.

7. State Responsibilities

7.1 State Plan Development

States play a very important role in the UCMR program by entering into Partnership Agreements (PAs) with EPA to facilitate State participation and implementation, and/or by reviewing the State Monitoring Plan (SMP). The SMP played a critical role in UCMR implementation by allowing States to: identify which small systems will participate in Assessment Monitoring (List 1); identify which systems will participate in the Screening Surveys (List 2); and specify various aspects of the timing and location of system monitoring.

All States (regardless of whether or not they entered into a PA with EPA) were asked to review the initial SMPs for their State. Review of the SMP included ensuring that small systems selected to participate in the UCMR were active and did not purchase all of their water. States were asked to replace ineligible systems with one of the two replacement systems that EPA identified for each “primary” system selected to monitor for the UCMR. In the SMPs, States were also asked to review inventory information as well as the timing and location of sampling. States were also asked to review the large system information for those that were selected to conduct Screening Surveys to ensure that these systems were eligible to conduct the Screening Surveys. Detailed information on SMP review and modification may be found in the Initial and Final State Plans which EPA sent to each participating State.

7.2 Partnership Agreements

During the UCMR rulemaking process, States suggested that EPA use a Memorandum of Agreement (which is represented by the PA) rather than the formal adoption of rules and revisions of each State’s primary enforcement responsibility (primacy) program to allow States to participate in UCMR implementation. PAs serve as a key implementation mechanism for the UCMR by identifying and assigning responsibility for important activities that must be conducted to successfully implement the UCMR. States that entered into an Agreement with EPA are generally responsible for reviewing and updating their SMPs, and notifying small and large systems of their Assessment Monitoring and Screening Survey responsibilities prior to scheduled sampling. In general, these States also provide small systems with instructions (prepared by EPA) on the location, frequency, and timing of sampling. The EPA contractor will provide small systems with instructions on the use of sampling equipment, and handling and shipment of samples.

States that entered into a PA and who have agreed to identify vulnerable systems for Pre-Screen Testing are responsible for notifying the PWS owners/operators of Pre-Screen Testing requirements at least 90 days before sampling must occur. States with an Agreement may also be responsible for specifying the latitude and longitude of PWS treatment plants by the time of the system’s reporting of Assessment Monitoring results to the NCOD.

Most States agreed to review and modify their SMPs, including modifying the vulnerable time for sampling, reviewing monitoring dates for systems, and specifying alternate dates if appropriate, and identifying alternate sampling points for small PWSs as needed. Note that many States which did not enter into PAs with EPA modified and reviewed the SMPs for their State.

Other responsibilities some States agreed to accomplish through the PA process included updating EPA’s Safe Drinking Water Information System (SDWIS) based on PWS inventory changes, ensuring that each PWS facility has a unique identification number, and providing EPA with a list of certified

laboratories in the State. Some States have also agreed to collect Assessment Monitoring and Screening Survey samples for small systems and/or Index System(s) selected to monitor in the State. Some States have also agreed to review UCMR data (in accordance with §141.35(b)) before EPA places data in the NCOD. Some States agreed to assist in obtaining system compliance through follow-up contact with systems regarding their monitoring responsibilities once informed of system non-compliance as provided for in §141.40(a)(8) and (b)(1)(v), (vi), (vii) and (viii).

Note that not all States are responsible for performing all of the activities identified above. A State's actual responsibilities are outlined in the PA as discussed and agreed to by the State and EPA. For some States, EPA is responsible for performing some of the activities outlined above.

7.3 State Waivers for Contaminants Monitored at Large Systems

States may apply to EPA for a waiver from monitoring requirements for specific contaminants for large systems. To apply for a waiver, States must submit the following to EPA (§141.40(b)(4)):

- a list of the contaminants for which waivers are requested; and
- supporting documentation that demonstrates that each contaminant for which a waiver is requested:
 - has not been detected in the source waters or distribution systems in the State (and this presumes that monitoring has been conducted) in the 15 years prior to the application date, and
 - has never been used, stored, disposed, or released in the State in the 15 years prior to the application date.

If the State can demonstrate that any contaminant meets these criteria, EPA may grant a waiver for that contaminant.

7.4 Governors' Petition to Add Contaminants to the Monitoring List

States may also petition EPA to add one or more contaminants to the unregulated contaminant monitoring list. This petition must be signed by the governors of at least seven States and must clearly identify the reason(s) for adding the contaminant to the monitoring list, including:

- the potential public health risk (particularly any information that might be available regarding disproportionate risks to the health and safety of children);
- the expected occurrence (including any available data);
- any analytical methods that are known or could be used to test for the contaminant(s); and
- any other information that could assist EPA in determining whether the addition of the contaminant(s) would preclude the listing of another contaminant of a higher public health concern (§141.40(b)(3)).

8. Participation of Tribal Public Water Systems

EPA Regional offices will work closely with Tribal water systems in their Region to successfully implement the UCMR. EPA Regions were asked to work with the Tribes in reviewing the systems selected to monitor for the UCMR as identified in the Monitoring Plan for Tribal water systems. Note that, for the selection of a national representative sample of small systems, all Tribes across the nation were grouped together (i.e., treated as one State) to ensure that at least two tribal water systems were selected to monitor for the UCMR. During the selection process, seven small tribal systems were selected to monitor for UCMR contaminants. No large tribal systems were selected to conduct Screening Surveys.

With respect to Tribal monitoring, the UCMR program was designed to share the responsibilities for unregulated contaminant monitoring between the EPA Regions and the selected Tribal systems. The EPA Regions will serve as a principal line of communication with the Tribes on UCMR issues. In concert with the Tribal systems, the EPA Regions will coordinate the identification and assignment of responsibilities for important activities that should be conducted to successfully implement the UCMR during the five-year implementation cycle for Tribal water systems. Thus, cooperation and dialogue between the EPA Regions and Tribes will be required in determining mutually agreed upon responsibilities, such as the review of system inventory information, sample collection, and shipment of sample kits to an approved laboratory.

8.1 Tribal Monitoring Plan Development

EPA Regions were asked to review the table of Tribal systems that were selected to monitor for the UCMR, and to ensure that the selected systems were active and did not purchase all of their water from another water system. EPA Regions were also asked to review and modify, if necessary, any inventory information provided in the Tribal system Monitoring Plan. If selected systems were not eligible to monitor for the UCMR, EPA Headquarters selected a replacement system from the list of alternate tribal systems. Because Tribal systems were selected on a national basis, an ineligible Tribal water system was not necessarily replaced with another system from the same EPA Region. After finalization of the Monitoring Plan, the EPA Regions were responsible for notifying their appropriate Tribal systems in the Monitoring Plan of their responsibilities under the UCMR (§141.40(b)(1)(v)).

8.2 Sample Collection Responsibility

Some EPA Regions and Tribal environmental office contacts plan to conduct the sampling at the small tribal PWSs to ensure the quality of the data collected under the UCMR. In the case of the Tribal water systems, the responsibility for this activity is delegated to the EPA Regions whose systems are included in the sample of primary Tribal water systems (Regions 5, 6, 7, 8, and 9). Tribal assistance with sample collection is an important contribution which helps provide EPA with the best data possible for decision making.

9. EPA Responsibilities

EPA Headquarters (primarily the Technical Support Center (TSC)) will directly implement the UCMR, with implementation and coordination assistance from EPA Regional contacts, the States, Territories, and Tribes. EPA is responsible for providing implementation guidance documents for systems, States, and EPA Regions. EPA will provide additional ongoing assistance as needed.

9.1 Partnership Agreements and State Monitoring Plan Development

EPA and the Association of State Drinking Water Administrators (ASDWA) drafted the Model Partnership Agreements for use by EPA in coordinating UCMR implementation responsibilities between the EPA Regions and the States. EPA Regions also worked closely with States in establishing mutually-agreed-upon responsibilities in the PAs. EPA Headquarters developed initial SMPs by selecting the national representative sample of small systems and providing detailed instructions on review and update of the initial SMPs. EPA was responsible for incorporating State modifications to SMPs and returning Final SMPs to States once all modifications were complete.

9.2 Sample Collection and Analysis

The TSC has contracted with a sample coordination contractor and with laboratories which will perform all sample analyses for small systems under the UCMR. EPA is providing these contractors with the information needed for scheduling sampling analysis. EPA will pay for the costs associated with shipping samples from small PWSs to the contract laboratories and with sampling analysis. The EPA contract laboratories will then report the results electronically to EPA for the small systems via the EPA web data entry form discussed in Section 6.

EPA, its contractors, and some States will assist with collecting all of the Assessment Monitoring samples for Index Systems in each year of the five-year monitoring cycle. However, all large systems and all other small systems are expected to collect their own Assessment Monitoring, Screening Survey, and Pre-Screen Testing samples. However, some States have committed to collecting samples for the small systems in their State.

9.3 Reviewing Analytical Results and Reporting Requirements

EPA has recently unveiled a web-based reporting database where laboratories will electronically report UCMR results. For quality assurance, EPA will review all UCMR data before the data are uploaded to the NCOD. All UCMR data will be made available to the public through the NCOD. EPA will maintain the UCMR database, and will assist States with compliance tracking for the UCMR, if requested. Refer to Section 6 for a more detailed description of system reporting requirements.

10. Contact Information

For further information on this guidance document, PWSs should contact their State drinking water agency, the appropriate EPA Region, or the Safe Drinking Water Hotline. Small PWSs, States, or Regions with questions on small system sampling kits should contact the UCMR Implementation Support Contractor (listed below). Large PWSs should contact the Safe Drinking Water Hotline.

State drinking water agencies with questions on this guidance should contact their appropriate EPA Region coordinator, or the UCMR Implementation Team Leader listed below.

EPA UCMR Implementation Team Leader:

Daniel Hautman, Technical Support Center, Standards and Risk Management Division, Office of Ground Water and Drinking Water (143), 26 West Martin Luther King Jr. Dr., Cincinnati, OH 45268. (513) 569-7274.

EPA UCMR Implementation Support Contractor:

Robin Silva-Wilkinson, Great Lakes Environmental Center (GLEC), 739 Hastings Street, Traverse City, MI 49686. (231) 941-2230.

Supplementary Information:

Regional Contacts

- I. Chris Ryan, 1 Congress Street, 11th Floor, Boston, MA 02118.
Phone: (617) 918-1567.
- II. Robert Poon, 290 Broadway, Room 2432, New York, NY 10007-1866.
Phone: (212) 637-3821.
- III. Michelle Hoover, 1650 Arch Street, Philadelphia, PA 19103-2029.
Phone: (215) 814-5258.
- IV. Janine Morris, Sam Nunn Federal Center, 61 Forsyth St, SW, Atlanta, GA 30303.
Phone: (404) 562-9480.
- V. Janet Kuefler, 77 West Jackson Blvd., Chicago, IL 60604-3507.
Phone: (312) 886-0123.
- VI. Andrew J. Waite, 1445 Ross Avenue, Suite 1200, Dallas, TX 75202.
Phone: (214) 665-7332.
- VII. Stan Calow, 901 N. Fifth Street, Kansas City, KS 66101.
Phone: (913) 551-7410.
- VIII. Rod Glebe, One Denver Place, 999 18th Street, Suite 500, Denver, CO 80202.
Phone: (303) 312-6627.
- IX. Jill Korte, 75 Hawthorne Street, San Francisco, CA 94105.
Phone: (415) 744-1853.
- X. Gene Taylor, 1200 Sixth Avenue, Seattle, WA 98101.
Phone: (206) 553-1389.

APPENDICES

1. Appendix A: Acronym List
2. Appendix B: Definitions
3. Appendix C: Number of Small Systems in Representative Sample, by State

Appendix A — Acronym List

2,4-DNT	- 2,4-dinitrotoluene
2,6-DNT	- 2,6-dinitrotoluene
4,4'-DDE	- 4,4'-dichloro dichlorophenyl ethylene, a degradation product of DDT
AOAC	- Association of Official Analytical Chemists
APHA	- American Public Health Association
ASDWA	- Association of State Drinking Water Administrators
ASTM	- American Society for Testing and Materials
CAS	- Chemical Abstract Service
CCL	- Candidate Contaminant List
CCR	- Consumer Confidence Reports
CDX	- Central Data Exchange
CFR	- Code of Federal Regulations
CFU/100 mL	- colony forming units per 100 milliliters
CWS	- community water system
DBP	- disinfection byproducts
DCPA	- dimethyl tetrachloroterephthalate, chemical name of the herbicide dacthal
DDT	- dichloro diphenyl trichloroethane, a general insecticide
EP	- entry point
EPA	- Environmental Protection Agency
EPTC	- s-ethyl-dipropylthiocarbamate, an herbicide
EPTDS	- Entry Point to the Distribution System
ESA	- ethanesulfonic acid, a degradation product of alachlor
FR	- Federal Register
GLI method	- Great Lakes Instruments method
LD	- lowest disinfectant residual
MD	- midpoint of the distribution system
mg/L	- milligrams per liter
MR	- maximum residence time in the distribution system
MRL	- minimum reporting level
MTBE	- methyl-tert-butyl-ether, a gasoline additive
NCOD	- National Drinking Water Contaminant Occurrence Database
NERL	- National Environmental Research Laboratory
NTIS	- National Technical Information Service
NTNCWS	- non-transient non-community water system
OGWDW	- Office of Ground Water and Drinking Water

PA	- Partnership Agreement
PWS	- Public Water System
QC	- quality control
RDS	- raw duplicate sample
RDX	- hexahydro-1,3,5-trinitro-1,3,5-triazine
RFS	- raw field sample
RPD	- relative percent difference
SDWA	- Safe Drinking Water Act
SDWARS	- Safe Drinking Water Accession and Review System
SDWIS	- Safe Drinking Water Information System
SM	- Standard Methods
SMP	- State Monitoring Plan
SR	- source/raw water sampling point, prior to treatment
TDS	- treated duplicate sample
TFS	- treated field sample
TSC	- Technical Support Center
TNCWS	- transient non-community water system
TTHM	- Total Trihalomethane
UCMR	- Unregulated Contaminant Monitoring Regulations/Rule
µg/L	- micrograms per liter
VOC	- volatile organic compound
WQP	- water quality parameter

Appendix B — Definitions

Assessment Monitoring means sampling, testing, and reporting of listed contaminants that have available analytical methods and for which preliminary data indicate their possible occurrence in drinking water. Assessment Monitoring will be conducted for the UCMR (1999) List 1 contaminants.

Index Systems means a limited number of small CWSs and NTNCWSs, selected from the Assessment Monitoring systems in State Plans, that will be required to provide more detailed and frequent monitoring for the UCMR (1999) List 1 contaminants (§141.40(a)(6)). In addition to the reporting information required for Assessment Monitoring, the Index Systems must also report information on PWS operating conditions (such as water source, pumping rates, and environmental setting) (§141.40(a)(6)). These PWSs must monitor each year of the 5-year UCMR cycle, with EPA paying for all reasonable monitoring costs (§141.40(a)(4)(i)(A)).

Listed contaminant means a contaminant identified as an analyte in Table 1, 141.40(a)(3) of the UCMR. To distinguish the current 1999 UCMR listed contaminants from potential future UCMR listed contaminants, all references to UCMR contaminant lists will identify the appropriate year in parentheses immediately following the acronym UCMR and before the referenced list. For example, the contaminants included in the UCMR (1999) List include the component lists identified as UCMR (1999) List 1, UCMR (1999) List 2 and UCMR (1999) List 3 contaminants.

Listing cycle means the 5-year period for which each revised UCMR list is effective and during which no more than 30 unregulated contaminants from the list may be required to be monitored.

Monitored systems means all community water systems serving more than 10,000 people, and the national representative sample of community and non-transient non-community water systems serving 10,000 or fewer people that are selected to be part of a State Plan for the UCMR.

Monitoring (as distinct from Assessment Monitoring) means all aspects of determining the quality of drinking water relative to the listed contaminants. These aspects include drinking water sampling and testing, and the reviewing, reporting, and submission to EPA of analytical results.

Most vulnerable systems (or *Systems most vulnerable*) means a subset of 5 to not more than 25 PWSs of all monitored PWSs in a State that are determined by that State in consultation with the EPA Regional Office to be most likely to have the listed contaminants occur in their drinking waters, considering the characteristics of the listed contaminants, precipitation, PWS operation, and environmental conditions (soils, geology and land use).

Pre-Screen Testing means sampling, testing, and reporting of the listed contaminants that may have newly emerged as drinking water concerns and, in most cases, for which methods are in an early stage of development. Pre-Screen Testing will be conducted by a limited number of PWSs (up to 200). Pre-Screen Testing will be conducted for the UCMR (1999) List 3 contaminants.

Random Sampling is a statistical sampling method by which each member of the population has an equal probability of being selected as part of a sample (the sample being a small subset of the population which represents the population as a whole).

Representative Sample (or *National Representative Sample*) means a small subset of all community and non-transient non-community water systems serving 10,000 or fewer people which EPA selects using a random number generator. The PWSs in the representative sample are selected using a stratified random sampling process that ensures that this small subset of PWSs will be representative of all small PWSs nationally.

Sampling means the act of collecting water from the appropriate location in a public water system (from the applicable point from an intake or well to the end of a distribution line, or in some limited cases, a residential tap) following proper methods for the particular contaminant or group of contaminants.

Sampling Point means a unique location where samples are to be collected.

Screening Survey means sampling, testing, and reporting of the List 2 contaminants. These contaminants have analytical methods which have been recently developed, and have uncertain potential for occurrence in drinking water.

State means, each of the fifty States, the District of Columbia, U.S. Territories, and Tribal lands. For the national representative sample, Guam, the Commonwealth of Puerto Rico, the Northern Mariana Islands, the Virgin Islands, and American Samoa are each treated as an individual State. All Tribal water systems in the U.S. that have status as a State under Section 1451 of the Safe Drinking Water Act for this program will be considered collectively as one State for the purposes of selecting a representative sample of small PWSs.

State Monitoring Plan (or *State Plan*) means a State's portion of the national representative sample of CWSs and NTNCWSs serving 10,000 or fewer people which must monitor for unregulated contaminants (Assessment Monitoring, Screening Survey(s) and Index Systems) and all large PWSs (PWSs serving greater than 10,000 people) which are required to monitor for Screening Survey contaminants. A State Plan will also include the PWSs required to conduct Pre-Screen Testing, selected from the State's designation of vulnerable PWSs.

Stratified Random Sampling is a procedure to draw a random sample from a population that has been divided into subpopulations or strata, with each stratum comprised of a population subset sharing common characteristics. Random samples are selected from each stratum proportional to that stratum's proportion of the entire population. The aggregate random sample (compiled from all the strata samples) provides a random sample of the entire population that reflects the proportional distribution of characteristics of the population. In the context of the UCMR, the population served by public water systems was stratified by size (with size categories of 500 or fewer people served, 501 to 3,300 people served, and 3,301 to 10,000 people served) and by water source type supplying the water system (ground water or surface water). This stratification was done to ensure that PWSs randomly selected as nationally representative sample PWSs would proportionally reflect the actual number of size and water type categories nationally.

Testing means, for the purposes of the UCMR and distinct from *Pre-Screen Testing*, the submission and/or shipment of samples following appropriate preservation practices to protect the integrity of the sample; the chemical, radiological, physical and/or microbiological analysis of samples; and the reporting of the sample's analytical results for evaluation. Testing is a subset of activities defined as *monitoring*.

Unregulated contaminants means chemical, microbiological, radiological and other substances that occur in drinking water or sources of drinking water that are not currently regulated under the federal drinking water program. EPA has not issued standards for these substances in drinking water (i.e., maximum contaminant levels or treatment technology requirements).

Vulnerable time (or *vulnerable period*) means the time of the year determined as the most likely to have the listed group of contaminants present at their highest concentrations or densities in drinking water.

Appendix C — Number of Small Systems in Representative Sample, by State

State/Tribe/Territory	Number of Small Systems Selected for Assessment Monitoring		
	<i>Number of CWS</i>	<i>Number of NTNCWS</i>	<i>Total Number of Systems</i>
EPA Region 1			
Connecticut	4	2	6
Maine	3	3	6
Massachusetts	11	1	12
New Hampshire	5	1	6
Rhode Island	2	0	2
Vermont	4	0	4
Region 1 Total	29	7	36
EPA Region 2			
New Jersey	14	2	16
New York	22	7	29
Puerto Rico	8	1	9
Virgin Islands	1	1	2
Region 2 Total	45	11	56
EPA Region 3			
Delaware	2	0	2
Maryland	6	2	8
Pennsylvania	26	11	37
Virginia	12	4	16
West Virginia	9	1	10
Region 3 Total	55	18	73
EPA Region 4			
Alabama	15	0	15
Florida	28	4	32
Georgia	20	2	22
Kentucky	9	0	9
Mississippi	28	2	30
North Carolina	20	2	22
South Carolina	9	2	11

State/Tribe/Territory	Number of Small Systems Selected for Assessment Monitoring		
	Number of CWS	Number of NTNCWS	Total Number of Systems
Tennessee	13	1	14
Region 4 Total	142	13	155
EPA Region 5			
Illinois	27	1	28
Indiana	18	2	20
Michigan	20	4	24
Minnesota	14	2	16
Ohio	23	5	28
Wisconsin	19	2	21
Region 5 Total	121	16	137
EPA Region 6			
Arkansas	13	0	13
Louisiana	26	1	27
New Mexico	6	2	8
Oklahoma	15	0	15
Texas	66	5	71
Region 6 Total	126	8	134
EPA Region 7			
Iowa	16	0	16
Kansas	12	0	12
Missouri	18	2	20
Nebraska	7	1	8
Region 7 Total	53	3	56
EPA Region 8			
Colorado	9	1	10
Montana	5	1	6
North Dakota	4	0	4
South Dakota	4	0	4
Utah	7	0	7
Wyoming	2	1	3

State/Tribe/Territory	Number of Small Systems Selected for Assessment Monitoring		
	Number of CWS	Number of NTNCWS	Total Number of Systems
Region 8 Total	31	3	34
EPA Region 9			
American Samoa	2	0	2
Arizona	12	0	12
California	43	5	48
Guam	1	0	1
Hawaii	3	0	3
Mariana Islands	2	0	2
Nevada	3	1	4
Region 9 Total	66	6	72
EPA Region 10			
Alaska	4	0	4
Idaho	8	0	8
Oregon	9	2	11
Washington	15	2	17
Region 10 Total	36	4	40
Tribal Systems			
Total for Tribes	6	1	7
National Total	710	90	800