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40 CFR Parts 9, 141 and 142
Revisions to the Unregulated Contaminant Monitoring Regulation for Public Water Systems; Final Rule

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Parts 9, 141 and 142

[FRL-6433-1]

RIN 2040-AD15

Revisions to the Unregulated Contaminant Monitoring Regulation for Public Water Systems

AGENCY: Environmental Protection Agency.

ACTION: Final rule.

SUMMARY: The Safe Drinking Water Act (SDWA), as amended in 1996, requires the U.S. Environmental Protection Agency (EPA) to establish criteria for a program to monitor unregulated contaminants and, by August 6, 1999, to publish a list of contaminants to be monitored. To conform to the Amendments, today EPA is promulgating the Unregulated Contaminant Monitoring Regulation (UCMR) for Public Water Systems (PWSs), which revises substantially the existing regulations for unregulated contaminant monitoring.

This final rule includes a list of contaminants to be monitored, procedures for selecting a representative nationwide sample of small PWSs that will be required to monitor, the frequency and schedule for monitoring, the sampling points, the approved analytical methods to be used, and procedures for entering the monitoring data in the National Drinking Water Contaminant Occurrence Database (NCOD), as required under section 1445 of SDWA, as amended. The data in the database will be used to identify contaminants on the Drinking Water Contaminant Candidate List (CCL), to support the Administrator's determination of whether or not to develop drinking water standards for a particular contaminant, and to develop standards for the contaminants that the Administrator selects.

DATES: *Effective Date*: The final rule is effective January 1, 2001.

For purposes of judicial review, this final rule is promulgated as on 1 p.m. Eastern time on October 1, 1999 as provided in 40 CFR 23.7.

The incorporation by reference of the publications listed in today's rule is approved by the Director of the **Federal Register** as of January 1, 2001.

ADDRESSES: Documents relevant to this action are available for inspection from 9 a.m. to 4 p.m. Monday through Friday, excluding legal holidays, at the Water Docket, East Tower Basement, U.S. EPA, 401 M Street, SW, Washington DC. For access to docket (Docket No. W-98-02) materials, please call (202) 260-3027 between 9 a.m. and 3:30 p.m. Eastern Time, Monday through Friday, to schedule an appointment. A reasonable fee may be charged for copying.

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Abbreviations and Acronyms Used in the Preamble and Final Rule

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
Alachlor ESA—alachlor ethanesulfonic acid, a degradation product of alachlor
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
BGM—Buffalo Green Monkey cells, a specific cell line used to grow viruses
CAS—Chemical Abstract Service
CASRN—Chemical Abstract Service Registry Number
CCL—Contaminant Candidate List
CCR—Consumer Confidence Reports
CERCLA—Comprehensive Environmental Response, Compensation & Liability Act
CFR—Code of Federal Regulations
CFU—colony forming unit
CFU/mL—colony forming units per milliliter
CWS—community water system
DCPA—dimethyl tetrachloroterephthalate, chemical name of the herbicide dacthal
DCPA mono- and di-acid degradates—degradation products of DCPA
DDE—dichloro dichlorophenyl ethylene, a degradation product of DDT
DDT—dichloro diphenyl trichloroethane, a general insecticide
DNA—deoxyribonucleic acid
EDL—estimated detection limit
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
FACA—Federal Advisory Committee Act
FTE—full-time equivalent
GC—gas chromatography, a laboratory method
GLI method—Great Lakes Instruments method
GW—ground water
GWUDI—ground water under the direct influence (of surface water)
HPLC—high performance liquid chromatography, a laboratory method
ICR—Information Collection Request/Rule
IRFA—initial regulatory flexibility analysis
IMS—immunomagnetic separation
IRIS—Integrated Risk Information System
IS—internal standard
LLE—liquid/liquid extraction, a laboratory method
MAC—*Mycobacterium avium* complex
MOA—Memorandum of Agreement
MCL—maximum contaminant level
MDL—method detection limit
MRL—minimum reporting level
MS—mass spectrometry, a laboratory method
MSD—sample matrix spike duplicate
MTBE—methyl-tertiary-butyl-ether, a gasoline additive
NAWQA—National Water Quality Assessment Program
NCOD—National Drinking Water Contaminant Occurrence Database
NDWAC—National Drinking Water Advisory Council
NERL—National Environmental Research Laboratory
NPS—National Pesticide Survey
NTIS—National Technical Information Service
NTNCWS—non-transient non-community water system
NTTAA—National Technology Transfer and Advancement Act
OGWDW—Office of Ground Water and Drinking Water
OMB—Office of Management and Budget
PAH—Poly-aromatic hydrocarbon
PB—particle beam
PBMS—Performance-Based Measurement System
pCi/L—picocuries per liter
PCR—polymerase chain reaction

^{210}Pb—Lead-210 (also Pb-210), a lead isotope and radionuclide; part of the uranium decay series
^{210}Po—Polonium-210 (also Po-210), a polonium isotope and radionuclide; part of the uranium decay series
PWS—Public Water System
PWSF—Public Water System Facility
QA—quality assurance
QC—quality control
RDX—royal demolition explosive, hexahydro-1,3,5-trinitro-1,3,5-triazine
RFA—Regulatory Flexibility Act
RPD—relative percent difference
RSD—relative standard deviation
SBREFA—Small Business Regulatory Enforcement Fairness Act
SD—standard deviation
SDWA—Safe Drinking Water Act
SDWIS—Safe Drinking Water Information System
SDWIS FED—the Federal Safe Drinking Water Information System
SM—Standard Methods
SMF—Standard Compliance Monitoring Framework
SMS—sample matrix spike
SOC—synthetic organic compound
SPE—solid phase extraction, a laboratory method
SRF—State Revolving Fund
STORET—Storage and Retrieval System
SW—surface water
TBD—to be determined
TNCWS—transient non-community water system
UCMR—Unregulated Contaminant Monitoring Regulation/Rule
UCM—Unregulated Contaminant Monitoring
UMRA—Unfunded Mandates Reform Act of 1995
USEPA—United States Environmental Protection Agency
UV—ultraviolet
VOC—volatile organic compound
µg/L—micrograms per liter

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Potentially Regulated Entities

The regulated entities are public water systems. All large community and non-transient non-community water systems serving more than 10,000 persons are required to monitor. A community water system (CWS) means a public water system which serves at least 15 service connections used by year-round residents or regularly serves at least 25 year-round residents. Non-transient non-community water system (NTNCWS) means a public water system that is not a community water system and that regularly serves at least 25 of the same persons over 6 months per year. Only a national representative sample of community and non-transient non-community systems serving 10,000 or fewer persons would be required to monitor. Transient non-community systems (i.e., systems that do not regularly serve at least 25 of the same persons over six months per year) would not be required to monitor. States, Territories, and Tribes, with primacy to administer the regulatory program for public water systems under the Safe Drinking Water Act sometimes conduct analyses to measure for contaminants in water samples and are regulated by this action. Categories and entities potentially regulated by this action include the following:

Category	Examples of potentially regulated entities	SIC
State, Territorial and Tribal Governments	States, Territories, and Tribes that analyze water samples on behalf of public water systems required to conduct such analysis; States, Territories, and Tribes that themselves operate community and non-transient non-community water systems required to monitor.	9511
Industry	Private operators of community and non-transient non-community water systems required to monitor.	4941
Municipalities	Municipal operators of community and non-transient non-community water systems required to monitor.	9511

This table is not intended to be exhaustive, but rather provides a guide for readers regarding entities likely to be regulated by this action. This table lists the types of entities that EPA is now aware of that could potentially be regulated by this action. Other types of entities not listed in the table could also be regulated. If you have questions regarding the applicability of this action to a particular entity, consult the person listed in the preceding **FOR FURTHER INFORMATION CONTACT** section.

I. Statutory Authority

SDWA section 1445(a)(2), as amended in 1996, requires EPA to establish criteria for a program to monitor unregulated contaminants and to publish, by August 6, 1999, a list of contaminants to be monitored. To meet these requirements, today's rule EPA substantially revises the existing Unregulated Contaminant Monitoring (UCM) Program, which is codified at 40 CFR 141.40. This final rule revises the regulations at 40 CFR 9.1, 141.35, 141.40, 142.16 and deletes and reserves 142.15(c)(3). The rule covers: (1) the frequency and schedule for monitoring, based on PWS size, water source, and likelihood of finding contaminants; (2) a new, shorter list of contaminants for which systems will monitor; (3) procedures for selecting and monitoring a nationally representative sample of small PWSs (those serving 10,000 or fewer persons), and; (4) procedures for entering the monitoring data in the National Drinking Water Contaminant Occurrence Data Base (NCOD), as required under section 1445.

II. Major Program Revisions

Since its inception in 1988, the UCM Program has collected occurrence data to help EPA determine which contaminants EPA should regulate based on contaminant concentrations in PWSs and the contaminants' adverse health effects levels. Today's rule is designed to improve and enhance this program in several important ways:

(1) A statistical approach to select only 800 representative systems for monitoring from the national total of 65,600 small systems reduces the monitoring burden of the water supply industry; the burden on small systems is significantly further reduced in that EPA will pay for virtually all of the costs associated with monitoring for the small systems that are part of the representative sample;

(2) A smaller number of contaminants to be monitored also reduces the testing and reporting burden of the water industry overall;

(3) The required information to be reported about each contaminant has been refined to improve the data quality for regulatory decisions; and

(4) Direct reporting of data for regulatory determination and development from systems to EPA reduces State reporting burden, and the opportunity for electronic reporting reduces the potential for data entry and submission.

A three-tier monitoring approach allows monitoring to start promptly for contaminants with approved analytical methods, while accommodating the need to delay implementation for contaminants needing further methods development. The rule also allows use of a State-EPA Memorandum of

Agreement, providing direct implementation in each State rather than implementation through primacy revisions, to address the three-tiered approach of the UCMR.

This program is a cornerstone of the "sound science" approach to future drinking water regulations, which is a goal of the 1996 SDWA Amendments. Data generated by this final rule will be used to: (1) evaluate and prioritize contaminants on the Contaminant Candidate List (CCL) and refine the CCL; (2) support the Administrator's determination of whether to regulate a contaminant under the drinking water program; and, (3) support the development of drinking water regulations.

In a related, cost-savings action, EPA published a Direct Final Rule (64 FR 1494) on January 8, 1999, suspending the monitoring requirements in effect for small systems serving 10,000 or fewer persons. The third round of monitoring by small systems under the existing list of unregulated contaminants would have overlapped with the monitoring required under this final rule. The Direct Final Rule saved small systems and States the cost of unnecessary monitoring. EPA believes it obtained sufficient data from the previous monitoring rounds to make decisions concerning the occurrence of the unregulated contaminants on its prior monitoring list for these systems. Large systems were not included in this Direct Final Rule since they had already begun the third round of monitoring in January 1998. This large system monitoring will provide confirming information on the occurrence of those contaminants. However, this final regulation cancels further monitoring by large systems for the existing list of contaminants effective January 1, 2001. Until that date, large systems must continue to monitor for the 48 contaminants listed in 40 CFR 141.40 (and also listed in Table 1 of "Revisions to the Unregulated Contaminant Monitoring Regulation for Public Water Systems," **Federal Register**, vol. 64, no. 83, April 30, 1999, p. 23401 (64 FR 23401)).

III. Regulatory Background

The requirements for unregulated contaminant monitoring were first established by the 1986 SDWA Amendments. Under this law, EPA implemented the drinking water standards in phases, with each phase having a set of contaminants for which maximum contaminant levels in drinking water were established. The phases also included unregulated contaminants for which more information was needed before decisions could be made regarding regulation of the contaminants. EPA included unregulated contaminant monitoring requirements in the Phase I chemical regulation, under 40 CFR 141.40(a)–(c). The Phase II regulation later superceded the Phase I rule, and some of the Phase I unregulated contaminants became regulated under Phase II. Additional contaminants were also added to the list of unregulated contaminants. The Phase V chemical regulation further modified the list of contaminants, as additional unregulated contaminants became regulated.

The basic monitoring and reporting requirements for unregulated contaminants were the same under the Phase I, Phase II, and Phase V regulations. PWSs were required to report their monitoring results to the primacy agencies (either the State or EPA), with States, in turn, reporting to EPA. Only systems serving fewer than 150 service connections were exempt from monitoring—provided they made their facilities available for monitoring by the States. Repeat monitoring was required every 5 years.

Section 125 of the 1996 SDWA Amendments substantially revised unregulated contaminant monitoring program. The new program includes: (1) a new list of contaminants (i.e., the Unregulated Contaminant Monitoring Regulation (UCMR) (1999) List; (2) a representative sample of PWSs serving 10,000 or fewer persons to monitor; (3) placement of the monitoring data in the NCOD, and; (4) notification of consumers that the monitoring results are available.

The 1996 amendments limit the number of contaminants to be monitored on the UCMR list to a maximum of 30. The amendments specify that only a representative sample of small systems are required to monitor, and that EPA must pay the reasonable costs of analyzing the samples taken by those systems. EPA will use the data generated by this monitoring effort in the development of future drinking water regulations.

Today's final rule will completely replace the requirements of the existing rule on the final rule's effective date of January 1, 2001. The existing requirements of 40 CFR 141.35 and 141.40 still apply to large systems serving more than 10,000 persons, (since their third round of monitoring had begun in January 1998) until January 1, 2001, as noted above in II. Major Program Revisions.

IV. Process of Preparing the Final Rule

EPA has been developing the final revisions to the Unregulated Contaminant Monitoring Regulation (UCMR) for public water systems since 1997. In December, 1997, EPA's UCMR development workgroup held a stakeholders meeting to obtain input from the public on major issues and options affecting the program and emanating from the Safe Drinking Water Act, as amended in 1996. EPA held a second stakeholders meeting in May 1998, on options under serious consideration for the UCMR. EPA engaged eleven external expert reviewers from March 1 through April 22, 1999 to examine and comment on the technical aspects of the proposed rule. These technical reviewers evaluated and commented on the chemical and microbiological contaminant analytical methods and reporting requirements, the statistical approach for the representative sample of small systems, and the sampling and monitoring approach. The comments of the technical reviewers were available to the public through the official docket and on the Internet through EPA's Office of Ground Water and Drinking Water electronic homepage.

EPA published the proposed rule in the **Federal Register** on April 30, 1999, for public comment. The comment period closed on June 14, with submissions from 39 commenters meeting the deadline and addressing all major aspects of the proposed regulation. EPA received one hundred sixteen comments after the public comment period closed, principally concerning the inclusion of perchlorate on the UCMR monitoring list. EPA considered and addressed all comments in the process of developing this final regulation.

V. Concise Description of Today's Action

A. Which Systems Must Monitor

Owners and operators of community and non-transient noncommunity water systems must monitor for unregulated contaminants if they serve more than 10,000 persons or if they are part of the representative sample of small systems serving 10,000 or fewer persons that will be randomly selected to monitor for these contaminants. Transient systems are not required to monitor for unregulated contaminants. Only purchased water systems that are identified by EPA or the State to sample at locations of low disinfectant residual or longest residence time are required to monitor for distribution system contaminants.

B. System Monitoring Requirements

The contaminants included in this action are: 2,4-dinitrotoluene, 2,6-dinitrotoluene, DCPA mono acid degradate, DCPA di acid degradate, 4,4'-DDE, EPTC, molinate, MTBE, nitrobenzene, terbacil, acetochlor, and perchlorate. Systems must also analyze for water quality parameters including, for chemical contaminants: pH; and for microbiological contaminants: pH, temperature, turbidity, free disinfectant residual and total disinfectant residual. Surface water systems must monitor during four consecutive quarters. Ground water systems must monitor two times five to seven months apart. One sampling event for surface and ground water systems must be during the vulnerable time of May 1 to July 31, or during an alternate vulnerable time selected by the State. Monitoring must be conducted at the entry point to the distribution system, or at other sampling locations previously specified by the State for compliance monitoring, for sampling points representative of each principal, non-emergency water source in use over the one year of monitoring. Large and small systems must monitor according to the quality control procedures described. Laboratories that are certified to use the indicated methods for the contaminants listed are automatically certified to analyze for unregulated contaminants. Small systems that are part of the representative sample which become part of State Monitoring Plans must follow instructions given them for unregulated contaminant sampling and shipment to the designated laboratory.

C. System Reporting Requirements

After testing for the contaminants on the monitoring list, the systems must report the results electronically to, or in an alternate format previously arranged with, EPA within 30 days following the month they receive the results. EPA will report the results for the small systems that are selected to be part of the State Monitoring Plans. EPA will hold the data for 60 days to allow for quality control review by systems and States before placing the data in the National Drinking Water Contaminant Occurrence Database.

Data required to be reported include: Public Water System (PWS) Identification Number; Sample Identification Number; Sample Collection Date; Contaminant/Parameter; Analytical Results—Sign; Analytical Result—Value; Analytical Result—Unit of Measure; Analytical Method Number; Public Water System Facility Identification Number—Source, Treatment Plant and Sampling Point; Sample Analysis Type; Detection Level; Detection Level Unit of Measure; Batch Identification Number; Spiking Concentration; Analytical Precision; Analytical Accuracy; Presence/Absence.

A system can have a laboratory report the results for it, but the system retains the responsibility for reporting. A system can report previously collected data as long as the data meet the requirements specified in 40 CFR 141.40(a) (3), (4), (5) and Appendix A and include the applicable water quality parameters and data listed previously that are required to be reported.

D. State and Tribal Participation

States and Tribes can enter into a Memorandum of Agreement (MOA) with the EPA concerning the implementation of the monitoring program. The MOA must address the following: accepting or modifying the State Monitoring Plan for small systems, determining an alternate vulnerable time, modifying the timing of monitoring, identifying sampling points for small systems, notifying small and large systems of their monitoring responsibilities, and providing instructions to systems. A State can remove a system from the State Monitoring Plan, after EPA review, as long as removal is not based on prior information on the occurrence or non-occurrence of contaminants at the system or the vulnerability of the system to the contaminants. States can decide not to participate in an MOA, in which case the EPA will establish a State Monitoring Plan. The governors of seven or more States can petition EPA to add contaminants to the monitoring list. States can apply to EPA to waive monitoring for large systems if they can demonstrate that the contaminants for which a monitoring waiver is sought have not occurred in the State in the past 15 years.

VI. Final Changes in the Unregulated Contaminant Monitoring Program

A. Revised List of Unregulated Contaminants To Be Monitored

1. Criteria for Selecting Contaminants for the UCMR

(a) Revising the UCMR (1999) List

Section 1445(a)(2)(B) requires EPA to list not more than 30 unregulated contaminants to be monitored by public water systems. EPA used the 1998 Contaminant Candidate List (CCL), established under section 1412(b)(1)(B) of SDWA, as the primary basis for selecting contaminants for future monitoring under the UCMR. Development of the CCL is discussed in the preamble to the proposed rule at 64 FR 23402. EPA believes, and nearly all public commenters addressing the use of the CCL as the basis for the UCMR List indicated, that the CCL process already uses the best available information on contaminants of concern and emerging contaminants that may need regulation. SDWA section 1445 (a)(2)(B)(ii) provides for the governors of seven or more States to petition the Agency to add contaminants to the UCMR List. This petition process allows for the flexibility to include contaminants that are emerging as concerns between the five-year listing cycles.

The CCL lists 26 chemical and 8 microbiological contaminants as occurrence priorities because additional data on their occurrence in drinking water are needed to help decide whether they should be regulated. The proposed rule did not address the two contaminants identified in the preparation of the CCL as highly localized in occurrence: perchlorate and RDX (hexahydro-1,3,5-trinitro-1,3,5-triazine). EPA now has information indicating that the occurrence of these contaminants is more widespread than originally thought. In response to this information, some of which was provided in public comments, EPA has added perchlorate and RDX to the final UCMR (1999) List. Perchlorate was added to the UCMR (1999) List because EPA feels that there is enough information on its occurrence in public water systems to warrant its inclusion in a national monitoring program. Since it was not included on the proposed UCMR (1999) List, EPA did not take comment on its analytical method, minimum reporting level, or sampling location. EPA is currently engaged in final validation of an analytical method for perchlorate. This validation is important because earlier analytical methods did not make adjustments for interferences from sulfate and chloride, thus reducing or eliminating detected concentrations. EPA feels that with this validation, the analytical method should be sufficiently ready for monitoring, and thus EPA has included perchlorate on the UCMR List 1. EPA plans to publish, for public comment, the analytical method, minimum reporting level, and sampling location for perchlorate shortly after the promulgation of this final rule. RDX now appears on UCMR (1999) List 2, indicating that additional information is available, and initial monitoring of occurrence in public water systems should occur but that its method needs further refinement.

Additionally, based on technical peer review and public comments, EPA moved Aeromonas from UCMR (1999) List 1 to UCMR (1999) List 2 in Table 1, because its analytical method is not expected to be validated until 2000 or 2001. Also, in response to public comments that the Agency include as many contaminants that could be tested under the same multi-analyte method as possible in Assessment Monitoring, EPA moved acetochlor to List 1 from List 2. This action is based on information that only minor refinements are needed in the method and those can be resolved before the effective date of today's rule. As a result, the analytical method is reserved until the details of the method are resolved. EPA plans to publish a revision to this final rule to approve an analytical method for acetochlor shortly after this rule's promulgation. EPA will likely publish a joint request for public comment on the analytical methods for perchlorate and acetochlor. EPA intends to approve and publish the methods as early as possible to allow monitoring to begin on January 1, 2001, and to allow for the reporting of any data obtained prior to January 1, 2001 to meet the requirements of this final Rule.

For the remaining contaminants on the CCL Occurrence Priorities List, EPA has evaluated the availability of analytical methods published by EPA or voluntary consensus standards organizations, such as the American Society for Testing and Materials (ASTM) and Standard Methods (SM). In addition, EPA prioritized analytical methods development activities for those compounds and microorganisms for which suitable analytical methods are not currently available. As listed in List 1 of Table 1, EPA identified 10 of the 12 listed chemical contaminants for which analytical methods are now available. UCMR (1999) List 1 contaminants are those for which monitoring is required under today's Rule, with the added note that analytical methods have yet to be approved for perchlorate and acetochlor. UCMR (1999) List 2 of Table 1 lists 16 contaminants for which analytical methods are being refined: 14 chemical contaminants, Aeromonas (a microorganism), and polonium-210 (discussed in Table 1). UCMR (1999) List 3 of Table 1 identifies seven microbiological contaminants and lead-210 for which analytical methods are being researched. Monitoring for contaminants on UCMR (1999) Lists 2 and 3 is not required until EPA promulgates revisions to this rule to specify analytical methods and related sampling requirements for them.

EPA requested comment on the addition to the UCMR (1999) List of two naturally occurring radionuclides with health concerns at low levels, lead-210 (pb-210), and polonium-210 (po-210). Both nuclides are in the uranium decay series, which also includes radium-226 and radon-222. Lead-210, with a half-life of 22 years, and one of its degradates, polonium-210, with a half-life of 138 days, have been found in drinking water. EPA is aware of the occurrence of these contaminants in shallow aquifers in Florida (Harada, et al., 1989; Upchurch, 1991), and in at least two other States. Because of potential occurrence, consequent health risks, and in response to public comments, EPA has added polonium-210 and lead-210 to the UCMR (1999) List and has placed them on Lists 2 and 3 respectively.

(b) Regulatory Approach for the UCMR (1999) List

EPA establishes in § 141.40(a)(3) that the contaminants listed in Lists 1–3 comprise the UCMR (1999) List, categorized based on the availability of analytical methods. UCMR (1999) List 1 is the basis for Assessment Monitoring. Assessment Monitoring will occur at all 2,774 large community and non-transient non-community public water systems serving more than 10,000 persons and at a representative sample of approximately 800 systems serving 10,000 or fewer persons identified in State Monitoring Plans. UCMR (1999) List 2 will be the basis for two Screening Surveys of approximately 300 systems each, statistically selected from those systems required to conduct Assessment Monitoring. UCMR (1999) List 3 will be used for Pre-Screen Testing at up to 200 systems selected because of their potential vulnerability to the specific contaminants. This monitoring approach is described in detail under Section VI.C, "Type of Monitoring Required of Public Water Systems Based on Listing Group." Assessment Monitoring (and associated "Index system" monitoring) is the only monitoring that would be required by today's action. This includes contaminants for which EPA expects to have developed analytical methods before implementation: perchlorate and acetochlor.

For contaminants on UCMR (1999) List 2 for which analytical methods are developed by the time of initial monitoring in 2001, EPA will amend this rule to require the first Screening Survey to be conducted at selected systems. For those contaminants on List 2 and List 3 that do not have well developed methods by the time of initial monitoring in 2001, EPA will issue a revision to this regulation to activate monitoring for them at the time when the methods are considered implementable, up to the limit of 30 contaminants to be monitored within the five-year contaminant listing cycle. Monitoring for those contaminants will then begin at a date specified in that prospective regulation. Therefore, monitoring of contaminants on UCMR (1999) Lists 2 and 3 is not required by today's action. Monitoring of these contaminants will only occur when EPA publishes a revision to this regulation specifying the analytical methods to be used and the period during which monitoring is to be completed.

(c) Analytical Methods Applicable to the UCMR (1999) List

The UCMR (1999) List development process focuses primarily on the availability of analytical methods for the listed contaminants and the level of information available for them at the time of its development. The discussion below highlights analytical method considerations in listing the contaminants for monitoring. Only the contaminants identified on UCMR (1999) List 1, will be monitored as a result of today's action, with the exceptions of perchlorate and acetochlor, for which analytical methods have yet to be approved. Contaminants on UCMR (1999) Lists 2 and 3 are included on the final UCMR (1999) List, but will not be activated for monitoring until EPA proposes and promulgates analytical methods that can be used to reliably measure their occurrence in drinking water. At that time, EPA will propose regulations for the monitoring of UCMR (1999) List 2 and 3 contaminants.

(i) Chemical Analytical Methods

The ability to correctly identify a chemical contaminant is directly related to the type of chemical and the analytical method used. Compounds such as disinfection byproducts are far less likely to be misidentified than pesticides because they are typically present at relatively high concentrations in disinfected waters, while pesticides are much less likely to occur, or occur at lower concentrations. The analytical method selected will determine the accuracy of the qualitative identification. In general, the most reliable qualitative identifications will come from methods that use mass spectral data for contaminant identification. However, these methods are typically less sensitive than methods that rely on less selective detectors.

Before EPA establishes a Maximum Contaminant Level (MCL), the Agency relies on an analytical method suitable for routine monitoring. It is likely that analytical methods in general use by laboratories performing drinking water analyses may not exist for some of the final compounds to be measured in the UCMR program. Complex analytical methods or methods requiring special handling often require more experienced laboratories than the laboratories performing routine compliance monitoring. Even when analytical methods that are in general use by analytical laboratories are available, limiting the analyses to a small number of laboratories operating under strict quality control requirements improves the precision and accuracy of the analyses, thereby increasing the usefulness of the data.

The option favored by many stakeholders for conducting the chemical laboratory analyses and made final today by EPA is the following:

For PWSs serving more than 10,000 people, the PWS is responsible for sample collection and analyses for Assessment Monitoring. This monitoring may be conducted at the same time as the required compliance monitoring, to the extent possible. For Assessment Monitoring, however, EPA requires in § 141.40(a)(3) and § 141.40 Appendix A, quality control procedures for both sampling and testing to ensure that the data collected under this regulation are of sufficient quality to meet the requirements of the related regulatory decisions. Thus, today's action specifies the analytical methods and procedures to be used in obtaining these data. The sampling and associated quality control requirements cover time frame, frequency, sample collection and submission, and review and reporting of results. The laboratory analytical quality control requirements address the use of a certified laboratory, sample collection/preservation, analytical methods, method detection limits, calibration, quality control samples, method performance tests, detection confirmation, and reporting. PWSs serving 10,000 or fewer persons must send their Assessment Monitoring samples to laboratories designated by EPA, since the Agency must pay for the reasonable costs of testing.

The purpose of the quality control requirements is to ensure that, since EPA will only be able to obtain results from 3,574 systems (2,774 large systems and a representative sample of 800 systems from 65,600 systems serving 10,000 or fewer persons), the Agency obtains the most reliable data possible. EPA is specifying the use of certain analytical methods that are currently available for monitoring (see Table 3. UCMR (1999) List, column 3). While these methods are routinely used by commercial and public water system laboratories (including some that are currently used for compliance monitoring), they have not been routinely used for the contaminants on the UCMR (1999) List. Note that, as shown in § 141.40(a)(3), Table 1, 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 Appendix A.

For the compounds included in this regulation, the following summary, Table 1, Status of Analytical Methods for Chemical Contaminants on the UCMR (1999) List, presents a brief overview of methods availability for each chemical contaminant.

TABLE 1.—STATUS OF ANALYTICAL METHODS FOR CHEMICAL CONTAMINANTS ON THE UCMR (1999) LIST

	CAS No.	Analytical methods	Status of availability
UCMR (1999) List 1—Chemical Contaminant			
2,4-dinitrotoluene	121-14-2	EPA 525.2	Method is adequate for monitoring.
2,6-dinitrotoluene	606-20-2	EPA 525.2	Method is adequate for monitoring.
4,4'-DDE	72-55-9	EPA 508	Methods are adequate for monitoring.
		EPA 508.1	
		EPA 525.2	
		D5812-96	
		AOAC 990.06	
Acetochlor	34256-82-1	In validation process	EPA anticipates that this compound can be added to the scope of EPA Method 525.2.
DCPA di acid degradate	2136-79-0	EPA 515.1	No method is available to measure the mono and di acid forms separately. All of the approved methods identify total mono and di acid forms.
		EPA 515.2	
		D5317-93	
		AOAC 992.32	
DCPA mono acid degradate	887-54-7	EPA 515.1	No method is available to measure the mono and di acid forms separately. All of the approved methods identify total mono and di acid forms.
		EPA 515.2	
		D5317-93	
		AOAC 992.32	
EPTC	759-94-4	EPA 507	Methods are adequate for monitoring.
		EPA 525.2	
		D5475-93	
		AOAC 991.07	
Molinate	2212-67-1	EPA 507	Methods are adequate for monitoring.
		EPA 525.2	
		D5475-93	
		AOAC 991.07	
MTBE	1634-04-4	EPA 524.2	Methods are adequate for monitoring.
		D5790-95	
		SM6210D	
		SM6200B	
Nitrobenzene	98-95-3	EPA 524.2	Methods are adequate for monitoring.
		D5790-95	
		SM6210D	
		SM6200B	

TABLE 1.—STATUS OF ANALYTICAL METHODS FOR CHEMICAL CONTAMINANTS ON THE UCMR (1999) LIST—Continued

	CAS No.	Analytical methods	Status of availability
Perchlorate	14797–73–0	In validation process	EPA is currently conducting analytical methods development to support the analyses of perchlorate. This new method will be based on the currently available ion chromatography methods, but will include a criteria detailing when a laboratory must perform a sample clean-up procedure to minimize the impact of elevated concentrations of chloride, sulfate or other dissolved solids.
Terbacil	5902–51–2	EPA 507 EPA 525.2 D5475–93 AOAC 991.07	Methods are adequate for monitoring.
UCMR (1999) List 2—Chemical Contaminant			
1,2-diphenylhydrazine	122–66–7	In development	Some methods evaluated but inadequate for monitoring. Priority for analytical method development. EPA anticipates that contaminant will be added to the scope of EPA Method 525.2.
2,4,6-trichlorophenol	88–06–2	In development	EPA Method 552 evaluated but subject to false positives from interferences of the derivitized byproduct of the contaminant. EPA anticipates that contaminant will be included in a new SPE/GC/MS method currently under development.
2,4-dichlorophenol	120–83–2	In development	EPA Method 552 evaluated but subject to quantitative uncertainty due to inadequate derivatization of the contaminant. EPA anticipates that contaminant will be included in a new SPE/GC/MS method currently under development.
2,4-dinitrophenol	51–28–5	In development	Some methods evaluated but inadequate for monitoring. EPA anticipates that contaminant will be included in a new SPE/GC/MS method currently under development.
2-methylphenol	95–48–7	In development	Some methods evaluated but inadequate for monitoring. EPA anticipates that contaminant will be included in a new SPE/GC/MS method currently under development.
Alachlor ESA and degradation byproducts of acetanilide pesticides.		To be determined	EPA is evaluating which specific contaminants will be included within this group of compounds. Analytical methods will be determined for the targeted contaminants.
Diazinon	333–41–5	In development	Diazinon is listed as a contaminant in several EPA and voluntary consensus standard organization methods but it is subject to rapid aqueous degradation. Preservation research currently being conducted to develop a preservation technique that would permit adding this compound to EPA Method 525.2.
Disulfoton	298–04–4	In development	Disulfoton is listed as a contaminant in several EPA and voluntary consensus standard organization methods but it is subject to rapid aqueous degradation. Preservation research currently being conducted to develop a preservation technique that would permit adding this compound to EPA Method 525.2.
Diuron	330–54–1	In development	While this compound is included in the scope of NPS Method 4 (LLE/HLPC/UV) and EPA Method 553 (SPE/HPLC/MS), these methods are not adequate for this monitoring. EPA anticipates that this compound can be included in a new SPE/HPLC/UV method currently being developed.
Fonofos	944–22–9	In development	Fonofos is listed as a contaminant in several EPA and voluntary consensus standard organization methods but it is subject to rapid aqueous degradation. Preservation research is currently being conducted to develop a preservation technique that would permit adding this compound to EPA Method 525.2.
Linuron	330–55–2	In development	While this compound is included in the scope of NPS Method 4 (LLE/HLPC/UV) and EPA Method 553 (SPE/HPLC/MS), these methods are not adequate for this monitoring. EPA anticipates that this compound can be included in a new SPE/HPLC/UV method currently being developed.
Polonium-210 (^{210}Po)	13981–52–7	In development	Radiochemistry laboratory capacity is limited.

TABLE 1.—STATUS OF ANALYTICAL METHODS FOR CHEMICAL CONTAMINANTS ON THE UCMR (1999) LIST—Continued

	CAS No.	Analytical methods	Status of availability
Prometon	1610–18–0	In development	Prometon is listed as a contaminant in several EPA and voluntary consensus standard organization methods but it is subject to rapid aqueous degradation in non-acidified samples and is not readily extracted in acidified samples. Preservation research is currently being conducted to add neutralizing the pH of acidified samples just prior to extraction. This would permit adding this compound to EPA Method 525.2.
RDX	121–82–4	In development	No EPA or consensus methods organization analytical methods for the analysis of RDX in water are currently available.
Terbufos	13071–79–9	In development	Terbufos is listed as a contaminant in several EPA and voluntary consensus standard organization methods but it is subject to rapid aqueous degradation. Preservation research is currently being conducted to develop a preservation technique that would permit adding this compound to EPA Method 525.2.
UCMR (1999) List 3—Chemical Contaminant			
Lead-210 (^{210}Pb)	14255–04–0	In development	Method is time-consuming and expensive. Radiochemistry laboratory capacity is limited.

(ii) Microbiological Analytical Methods

The discussion of data quality for chemical analytical methods also applies to microbiological testing when analytical methods are developed for CCL microorganisms. When microorganisms were proposed for the CCL, EPA recognized that analytical methods were not well developed for the majority of them. Because of the lack of available analytical methods, some of the CCL microorganisms were grouped either into one category where information was available about methodologies indicating a need to further refine them, or another category where more research, including research on detection methods and occurrence, was needed. At the present time, and based on technical peer review and public comment, *Aeromonas* is the only one of the microorganisms for which more occurrence data are needed that also has an analytical method likely to be sufficiently developed for monitoring in time for implementation of the Screening Surveys. Three other microorganisms have methods available, but are in need of further methods development. These microorganisms (Cyanobacteria, Echoviruses, and Coxsackieviruses) may be candidates for the Screening Surveys if methods development proceeds expeditiously (§ 141.40(a)(3), Table 1, List 2), but are currently identified for Pre-Screen Testing (Table 1, List 3). The remaining four microorganisms currently lack satisfactory methods and will be evaluated for Pre-Screen Testing.

Several microorganisms on the CCL are actually groups of microorganism taxa. In some cases, the taxa have so many members that, given the limited resources available for UCMR monitoring, EPA may have to prioritize which strains, species, or serotypes are the most important to consider and target those for monitoring or further study. Decisions will have to be made on the basis of health risk, disinfection resistance, occurrence in water, and other factors. To address the need to prioritize which microorganisms should be targeted for monitoring, EPA's Office of Research and Development is assisting the Office of Ground Water and Drinking Water in establishing a research program for health effects, treatment, and analytical methods.

TABLE 2.—STATUS OF ANALYTICAL METHODS FOR MICROBIOLOGICAL CONTAMINANTS ON THE UCMR (1999) LIST

	Availability of analytical method	Status of availability
List 2—Microbiological Contaminant		
Aeromonas	Analytical method likely to be available for monitoring.	Current modification and evaluation of a published membrane filtration method (Havelaar et al., 1987) indicates that this method will be suitable for the monitoring program.
List 3—Microbiological Contaminant		
Cyanobacteria (blue-green algae, other freshwater algae and their toxins).	Methods available but not standardized.	Methods are available for counting cyanobacteria but new, standardized methods are needed for direct counts of targeted species with filtration methods or a counting chamber. Standardized analytical methods are also needed to detect the more important cyanobacterial toxins.
Echoviruses	Methods available but not standardized.	Echoviruses can be cultured on BGM cells and detected by the ICR method but require supplemental methods such as serological typing to distinguish echoviruses from other viruses. Cost of cell culture assays plus serotyping can be high. RT/PCR methods are subject to interferences and do not demonstrate infectivity. Combined cell culture and PCR, which demonstrates infectivity, may be considered.

TABLE 2.—STATUS OF ANALYTICAL METHODS FOR MICROBIOLOGICAL CONTAMINANTS ON THE UCMR (1999) LIST—Continued

	Availability of analytical method	Status of availability
Coxsackieviruses	Methods available but not standardized.	Group B coxsackieviruses are easy to grow in tissue culture but group A coxsackievirus detection in cell culture is variable. Culturable coxsackieviruses can be detected with the ICR method but serological typing is needed to distinguish coxsackieviruses from other viruses. RT/PCR methods are subject to interferences and do not demonstrate infectivity. New, standardized methods are needed. Combined cell culture and PCR methods may be considered.
Helicobacter pylori	No suitable method currently available.	*Helicobacter pylori* is difficult to cultivate because of its slow growth rate and the need for a low oxygen environment. No selective medium exists that will discriminate H. pylori from background bacteria. A culture-based method that demonstrates viability is preferred. Methods are needed for selective growth and identification. IMS has been used to concentrate *Helicobacter pylori*. Methods using PCR alone have been used but have not been validated by EPA. In general, PCR methods are not preferred due to interferences and their inability to demonstrate viability. A combined cultural and molecular method may be considered.
Microsporidia	No suitable method currently available.	No methods are available for the monitoring of the two species of human microsporidia which may have a waterborne route of transmission [*Enterocytozoon bienuesi* and *Encephalitozoon* (formerly *Septata*) *intestinalis*]. Spores could possibly be detected by methods similar to those being developed for *Cryptosporidium parvum*. Potential methods may utilize water filtration, clean-up with IMS, and detection using microscopy with either fluorescent antibody or gene probe procedures. Provided that procedures are validated by EPA, reverse-transcriptase (RT)—PCR techniques may be considered for monitoring, although PCR methods in general are not preferred at this time due to interferences and their inability to demonstrate viability. Due to the small size of microsporidia, problems could be encountered during filtration.
Adenoviruses	No suitable method currently available.	Adenoviruses serotypes 1 to 39 and 42 to 47 can be grown in tissue culture but enteric adenoviruses 40 to 41 are difficult to grow. Several selective tissue culture methods and detection methods have been reported. A selective, standardized method is needed for monitoring. PCR methods are not preferred, as they are subject to interferences and do not demonstrate infectivity. A combined cell culture and PCR method may be considered.
Caliciviruses	No suitable method currently available.	No tissue culture methods exist for the two genogroups of caliciviruses on the CCL (the Norwalk-like and the Snow Mountain-like agents). No sensitive or fully developed detection methods exist. PCR methods are not preferred, as they are subject to interferences and do not demonstrate infectivity. A combined cell culture and PCR method may be considered if a suitable cell line is found.

2. List of Contaminants To Be Monitored

(a) Final UCMR (1999) List

Section 141.40 (a)(3) Table 1, Unregulated Contaminant Monitoring Regulation (1999) List, presents EPA's list of unregulated contaminants for monitoring under Section 1445(a)(2)(B)(i) of the 1996 Amendments for the first five-year listing cycle. The monitoring program for these contaminants is a three-tiered approach based on the availability of information about each contaminant and the availability of analytical methods for each contaminant. This approach is described in Section C., Type of Monitoring Required of Public Water Systems Based on Listing Group. The final monitoring program divides the listed unregulated contaminants into three lists: List 1, for which Assessment Monitoring will be required, List 2, designated for the Screening Surveys; and List 3, designated for Pre-Screen Testing. Today's final regulation only requires Assessment Monitoring for UCMR (1999) List 1 contaminants beginning on January 1, 2001, with the exceptions of perchlorate and acetochlor, for which analytical methods have not yet been approved (but are planned to have monitoring begin on that date, also, after rulemaking to specify their analytical methods). The monitoring for contaminants on Lists 2 and 3 will only be required after EPA promulgates further rules.

Technical peer review and public comments strongly supported the three-tier approach of the UCMR program. As a result, EPA requires in today's action Assessment Monitoring for the contaminants on UCMR (1999) List 1, because analytical methods for these contaminants currently exist or will shortly be validated. EPA will shortly publish a request for public comment on a revision to this final rule to implement the analytical methods and other sampling requirements for perchlorate and acetochlor. Also, by future rulemaking, EPA plans to implement the Screening Survey (List 2) monitoring in groups of contaminants, rather than one contaminant at a time, to minimize sampling and testing costs since some of the contaminants may be tested by the

same method. EPA intends to take a similar approach with the contaminants on List 3, the Pre-Screen Testing. EPA plans to require, through future rulemaking, Pre-Screen Testing for contaminants for which EPA determines that new analytical methods can measure their existence in locations where they are most likely to be found. All analytical methods for contaminants on Lists 2 and 3 would be peer reviewed, following EPA's policy for peer review, before the Agency proposes regulations which would require public water systems to monitor for them.

In § 141.40 (a)(3), Table 1, UCMR (1999) List 1 contaminants, for Assessment Monitoring, are chemical contaminants for which analytical methods capable of generating the quantity and quality of data required under the UCMR are currently available, or expected to be available shortly after today's final rule. Monitoring for these contaminants is required under today's final UCMR, with the exceptions of perchlorate and acetochlor, as noted.

UCMR (1999) List 2 contaminants (14 organic chemicals, one radiochemical and one microorganism), for the Screening Surveys, are those for which EPA is currently refining analytical methods. Development of these methods should be sufficient for Screening Surveys to be conducted in the first three years of the listing cycle, but may occur in the later years of the cycle. These contaminants are characterized in today's final rule at § 141.40(a)(3), Table 1, Unregulated Contaminant Monitoring Regulation (1999) List, List 2.

UCMR (1999) List 3 contaminants (seven microbiological contaminants or contaminant groups and one inorganic chemical), for Pre-Screen Testing, are those for which EPA has begun or shortly will begin analytical methods development, but completion of those efforts is not expected prior to the Assessment Monitoring required under implementation of this regulation. Instead, these contaminants will be tested for in Pre-Screen Testing. These contaminants are listed in today's final rule at § 141.40(a)(3) as Table 1, Unregulated Contaminant Monitoring List, List 3.

Tables 3 and 4, in IV.A.1.(c), Analytical Methods Applicable to the UCMR (1999) List, present a summary of the status of the methods for all the contaminants on this list.

EPA believes that this three-tiered approach to the UCMR, which was recommended by stakeholders, reflects a balance between the implementability of current analytical methods and the need to obtain data in time frames that are useful for responding to concerns about the contaminants identified.

(b) Number of Contaminants on the UCMR (1999) List

Thirty-six contaminants are on today's final UCMR (1999) List. SDWA Section 1445 (a)(2)(B)(i) states that in August 1999 and every five years thereafter "the Administrator shall issue a list of * * * not more than 30 unregulated contaminants to be monitored by public water systems and to be included in the national drinking water occurrence data base * * *" EPA interprets this to mean that the UCMR list may contain more than 30 contaminants, as long as monitoring is not required for more than 30 contaminants during a five-year listing cycle. Public comments were split on whether the monitoring list should have more than 30 contaminants. EPA believes that maintaining a monitoring list with more than 30 contaminants, while requiring monitoring for no more than 30, is responsive to public concerns about contaminants in drinking water. This interpretation and approach also supports EPA's efforts to respond to and encourage analytical methods development for emerging contaminants.

Any PWS may voluntarily submit data to EPA, including data for contaminants that a PWS may monitor that are on the UCMR (1999) List of 36 contaminants, but that are not on the final list of 30 contaminants actually required for UCMR monitoring. EPA is preparing a guidance document specifying the procedures for future voluntary submission of such data to the National Drinking Water Contaminant Occurrence Database (NCOD).

B. Public Water Systems Subject to the UCMR

The monitoring in this final rule focuses ultimately on determination of, on a national basis, the occurrence or likely occurrence of contaminants in drinking water delivered by community water systems (CWS) and non-transient non-community water systems (NTNCWS). For regulatory purposes, public water systems are categorized as "community water systems," or "non-community water systems." Community water systems (CWSs) are specifically defined as "public water systems which serve at least 15 service connections used by year-round residents or regularly serve at least 25 year-round residents." (40 CFR 141.2) A "non-community water system" means any other public water system. Non-community water systems include nontranisent non-community water systems (NTNCWSs) and transient non-community water systems. Non-community water systems are available to serve the public, but are not used on a year-round basis in most cases. Non-transient systems regularly serve at least 25 of the same persons over six months per year (e.g., schools). Transient systems do not regularly serve at least 25 of the same persons over six months per year. Additionally, some community water systems purchase all or part of their water supply from other water systems. Purchased water systems may be at the end of a distribution system from the water system selling the water.

One of the factors considered in establishing the UCMR program is the number of persons served by a system. With respect to size, about 2,774 large systems (each serving more than 10,000 persons) provide drinking water to about 80 percent of the U.S. population served by public water systems. Under today's final regulation, all large systems will be required to monitor the unregulated contaminants specified in § 141.40(a)(3), List 1 of Table 1, UCMR (1999) List, with the exception of perchlorate and acetochlor for which analytical methods have not been promulgated. In response to public comment on purchased water systems representing the end of a distribution system, purchased water systems are also included in this monitoring requirement for microbiological contaminants that occur primarily in distribution systems with maximum residence times or low disinfectant residuals which may allow microorganisms that have human health effects to survive and reproduce.

Section 1445(a)(2)(A) requires that the UCMR ensure that only a representative sample of systems serving 10,000 or fewer persons (small systems) monitor for unregulated contaminants. Small community water systems and small non-transient, non-community water systems total 65,636 systems. From this total number of small systems, EPA will select a national representative sample of 800 small systems. EPA is excluding transient non-community systems from UCMR requirements. The variation in the 97,000 transient systems would be difficult to reflect in a national representative sample and would be very costly to monitor. Furthermore, projecting contaminant exposure results from such systems would be complex and inconclusive because of the transient nature of the population that uses them. The results from the very small community and non-transient non-community systems (NTNCWS) can be extrapolated to the transient non-community systems. Public comments

supported not including these systems in the representative sample. One commenter suggested that transient systems be the subject of a special survey since they may be a pathway of exposure for a specific segment of the population. At this time, EPA is not planning any special surveys of transient systems because they are such a large and diffuse category and it is difficult to compile and evaluate population exposure information for this category of water systems.

EPA will pay for the reasonable costs of monitoring by the small systems selected for the representative sample, as long as the systems are part of a State Monitoring Plan. The EPA will select systems to monitor through the use of a random number generator according to a national representative sample selection plan developed primarily on the basis of population served by PWSs in each State. This detailed selection plan is necessary to ensure that the sample is statistically valid and representative of all small water systems nationally. This plan is also necessary because EPA typically has the least information about these systems and needs a consistent base of data for regulation development. EPA will use a national sample of approximately 800 systems serving 10,000 or fewer persons which the EPA will statistically draw from all small CWSs and NTNCWSs nationally. Section F, "Representative Sample of Systems Serving 10,000 or Fewer Persons," provides the details of the sample selection plan, including the sample size. The number of systems selected within each size category of systems will be based on the proportion of population served by that size category. System selection will be further allocated across water source type and distributed across all states.

The State-based component of this national representative sample, called a State Monitoring Plan (or State Plan), will include the list of systems statistically selected for UCMR monitoring. Other state responsibilities will be defined in the Memorandum of Agreement issued between the States and EPA. The State can review, and modify if necessary, the list of systems in the State Plan. The resulting State Plans will then be part of a national sample framework, providing the representative national sample requisite to drawing national conclusions for contaminant exposure.

To provide a more capable understanding of contaminants and conditions affecting small systems, and to provide additional quality assurance, EPA will randomly select up to 30 small public water systems from the systems in State Monitoring Plans as "Index" systems. Index systems must monitor every year during the five year UCMR listing cycle. These systems will also be required to report information on system operating conditions (such as water source, pumping rates, and environmental setting). This information will assist EPA in more fully evaluating small system operations and future regulations of small systems. EPA will conduct the sampling and testing for Index systems. At the time of sampling, EPA will also gather other 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).

Also, up to 150 additional small systems might be selected for the Pre-Screen Testing. The systems for the Pre-Screen Testing will be selected on the basis of their representativeness of systems most vulnerable to the particular UCMR (1999) List 3 contaminants for which methods have been refined. The statistical selection of the 800 systems for the national representative sample may not include the systems determined to be most vulnerable to these contaminants, hence; the States and EPA may need to select additional systems for this targeted testing.

External expert peer review and public comments supported the statistical approach described to select small systems for the national representative sample and State Monitoring Plans.

C. Type of Monitoring Required of Public Water Systems Based on Listing Group

At the UCMR Stakeholders Meeting on June 3–4, 1998, a diverse group of stakeholders suggested that the UCMR Program be developed through a progression of monitoring levels based on contaminant group characteristics. These characteristics reflect current information about both the occurrence of and method availability for the contaminants. Occurrence information and methods availability will determine which phase, or tier, of monitoring the contaminants will be placed. Both EPA and stakeholders are also concerned about contaminants that may be "emerging" as contaminants of concern. These emerging contaminants have not been monitored before, but have the potential to be found near or in drinking water supplies or recently have been identified as potential health problems. It is not likely that there exists approved EPA analytical methods for the "emerging contaminants of concern". Typically, "research" analytical methods are used to detect such emerging contaminants and may be expensive. EPA will have to either develop an approved method for inclusion in a regulatory approach, or perhaps substitute a regulatory approach with a study using a single laboratory and a "research" analytical method. The resources needed to develop an approved analytical method will face competing resource demands for other contaminants on the CCL that also require analytical method development. In recognition of these considerations, as described above, the final rule incorporates an approach with three monitoring levels, or tiers, referred to as "Assessment Monitoring," "Screening Survey," and "Pre-Screen Testing".

1. Assessment Monitoring

The first type of monitoring in the three-tiered monitoring program of today's rule pertains to the group of contaminants for which analytical methods are currently available and are specified in § 141.40(a)(3), Table 1, UCMR (1999) List 1, Assessment Monitoring Importantly, these contaminants are ones for which initial data for PWSs indicate that the contaminants occur in at least two States or ten public water systems and should be monitored to assess national occurrence through the UCMR. Based on today's rule, all contaminants in § 141.40(a)(3), Table 1, List 1 must be monitored in the Assessment Monitoring tier of the UCMR Program, except perchlorate and acetochlor, for which analytical methods are soon to be finalized.

In § 141.40, EPA indicates that each system must conduct UCMR "Assessment Monitoring" of List 1 contaminants for a twelve-month period in the first three years (i.e., 2001 through 2003) of a five-year UCMR contaminant listing cycle (i.e., 2001 through 2005). Large systems must complete this monitoring in any twelve-month period within the years 2001 to 2003. Small systems in State Monitoring Plans must complete the monitoring according to the scheduled monitoring identified in those plans within the period of 2001 to 2003. Section F, "Representative Sample of Systems Serving 10,000 or fewer persons," describes in detail the selection of the subset of small systems required to monitor. The State could specify in the State Monitoring Plans a schedule that would correlate with compliance monitoring. This arrangement should enable systems to complete UCMR

sampling coincident with their compliance monitoring for regulated contaminants during one of the years when compliance monitoring is required. However, EPA recognizes that some large systems may not be required to monitor for any regulated contaminants during the five-year UCMR listing cycle. In that case, such large systems could monitor for the unregulated contaminants during any twelve-month period within the three years they choose. This approach, as originally proposed, is responsive to public comments that UCMR monitoring be able to be conducted in conjunction with compliance monitoring.

EPA is requiring that surface water systems monitor for four consecutive quarters in the designated, or, in the case of large systems, selected, monitoring year, and that ground water systems monitor two times approximately five to seven months apart in their monitoring year. Under Assessment Monitoring, systems serving more than 10,000 persons must conduct and pay for their own sample collection and testing. Small systems included in State Monitoring Plans must collect the samples with EPA-supplied equipment and send the samples to EPA-specified laboratories. EPA will pay for the testing and reporting. Although the laboratory may report the information directly to EPA and provide a copy to the State, the system still has final reporting responsibility to ensure that results are reported to EPA and copied to the State. Frequency and location of monitoring are discussed in section D, "Monitoring Requirements under the Final UCMR."

2. Screening Surveys

The contaminants that EPA is considering for the Screening Survey are listed in § 141.40(a)(3), Table 1, List 2. These contaminants are those for which analytical methods are under development and for which EPA has less occurrence data than for the contaminants on List 1. The purpose of the Screening Survey is to analyze for contaminants where the use of newly developed, non-routine analytical methods are required. To do this and still maintain adequate quality of the occurrence data, EPA will use only a select, controlled group of laboratories. In addition, the Screening Survey approach might allow EPA to maximize scientifically-defensible occurrence data for emerging contaminants of concern more quickly than could be obtained through a more standard unregulated contaminant monitoring effort. The Screening Survey could, for example, be useful where questions concerning whether a contaminant of concern is in fact occurring in drinking water and the range of concentration of that occurrence. The Screening Survey is also intended to allow EPA to screen contaminants to see if they occur at high frequencies or concentrations that justify inclusion in future unregulated contaminant Assessment Monitoring or at sufficiently low frequencies that do not require further monitoring, but allow the Agency to evaluate standard development.

The contaminants in UCMR (1999) List 2 will be monitored by a smaller, statistically selected sample from all (large and small) community and non-transient non-community water systems (about 300 systems total). These systems will be selected through a random number generator. Systems will not have to initiate Screening Surveys until after EPA promulgates requirements for Screening Surveys. The sample size needed for estimating frequencies of contaminant occurrence are smaller if the actual occurrence frequencies are close to 0 or to 100 percent. When a contaminant is consistently present or consistently absent it requires fewer samples to determine its frequency with adequate statistical confidence than if it occurs about half the time. Only 300 PWSs are needed to determine if a contaminant is present 5 percent of the time or less frequently, at a 99 percent confidence level and with a 3 percent margin of error. (The same criteria require 1,844 samples when the frequency could be any number.) If the contaminant occurrence findings are above the thresholds established for the Screening Survey, EPA will include the contaminant in the next Assessment Monitoring round (projected to begin in 2006) of the UCMR Program. The statistical threshold for positive results from this monitoring to determine if further monitoring is warranted might be 1 to 2 percent of systems with detections. If the contaminant occurrence were under the threshold, then no further testing would be required, and the contaminant may be removed from the list in a future UCM rulemaking. EPA requested public comment on whether the statistical threshold of 1 to 2 percent of systems is adequate to make a determination that further Assessment Monitoring should be conducted to determine the extent of contaminant occurrence, and, if not, what percent should be used as the threshold for such a determination. One commenter suggested that EPA should use a threshold of 3 to 5 percent, but did not provide any rationale. EPA believes that 1 to 2 percent is consistent with the approach that this monitoring is a Screening Survey to determine whether the contaminant(s) are occurring in any public water system. One to 2 percent occurrence is equal to 3 to 6 systems for the sample, but statistically this can be extrapolated to 600 to 1,200 systems out of all small systems that may have an occurrence of the contaminants. For a sample size of 300, occurrence of a contaminant on the monitoring list in any system would indicate that the contaminant occurs at a frequency greater than 0 (zero). Therefore, EPA should give further consideration to the occurrence and concentration of such a contaminant and may evaluate the extent of its occurrence nationally. EPA considers this extent of occurrence to be significant and to warrant more extensive monitoring, perhaps even through Assessment Monitoring. Another commenter indicated that EPA should evaluate other factors and not just the extent of occurrence before deciding to regulate a contaminant. EPA agrees with this comment and will continue to evaluate other factors.

The anticipated analytical methods that might be used for Screening Surveys are identified in § 141.40(a)(3), Table 1, List 2, as "Analytical Methods." These methods are being refined for the particular contaminants on List 2 and are not expected to be ready for use in an Assessment Monitoring program. Therefore, as analytical methods are developed for groups of contaminants on List 2, EPA will propose a rule modification for public comment and will promulgate analytical methods, minimum reporting levels and the location and timeframe for sampling for each contaminant.

Additionally, EPA requested public comment on two potential outcomes from the Screening Survey: (1) if the contaminant is observed at very few or no PWSs (i.e., less than the threshold of 1 to 2 percent of systems), then the contaminant may be dropped from the UCMR (1999) List 2 and no further monitoring for it will occur; and, (2) if the contaminant is observed extensively (i.e., in a higher percentage of PWSs, such as 5 to 10 percent) and EPA has health effects data for the contaminant that indicate a significant concern, then that specific contaminant may move directly to the regulation development stage. In these cases, there may be no Assessment Monitoring tier of monitoring activity to provide additional occurrence data for that contaminant. One commenter expressed concern that EPA would move directly to regulation development after obtaining results from Screening Surveys for a contaminant and stated

that EPA should move the contaminant up to Assessment Monitoring before taking any action. EPA believes that an occurrence of a contaminant in 5 or 10 percent of systems, for example, in the screening survey may be sufficient to determine whether or not to initiate regulation development. EPA may decide that it needs more information, in which case, EPA could move the contaminant to Assessment Monitoring (List 1) for more extensive monitoring to inform the regulatory process, but this may not always be necessary.

With respect to funding the Screening Survey, EPA will pay for the testing and reporting (as described in Preamble section V.G., Reporting of Monitoring Results) for systems serving 10,000 or fewer persons. Systems serving 10,000 or fewer persons will be responsible for sample collection and preparing the samples for shipment. EPA will pay for the shipment of these samples to an EPA-designated laboratory for testing and for reporting of monitoring results to EPA, with a copy to the State.

For large systems serving more than 10,000 persons, EPA requested public comment on whether it should set performance standards and allow systems to conduct their own laboratory analyses in compliance with the standards, or should approve a limited but sufficient number of laboratories to do lab analyses for large systems, providing for quality control across a manageable number of laboratories while allowing competitive pricing of services. Most commenters, including water system operators, favored EPA approval of a limited number of laboratories, but noted that a sufficient number of laboratories were needed so that competitive pricing would be available.

EPA expects the Screening Surveys will occur one or two times during the five-year listing cycle of 2001 through 2005. EPA expects that this Screening Survey monitoring will occur for groups of contaminants, rather than for one contaminant at a time, depending on when the different methods are promulgated and the timing of their promulgation. Systems selected for the Screening Surveys will monitor at the same frequency as for contaminants under Assessment Monitoring. Should approval and implementation of the analytical method for a particular contaminant become delayed, the contaminant might be moved into the category of Pre-Screen Testing, described next.

3. Pre-Screen Testing

The third tier of the final monitoring program is "Pre-Screen Testing", which will be conducted for contaminants with analytical methods that are in an early stage of development and at systems that are determined to be most vulnerable to the occurrence of contaminants on the Pre-Screen Testing list. Pre-Screen Testing means sampling, testing, and reporting of the listed contaminants that 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 performed to determine whether a listed contaminant occurs in sufficient frequency in the most vulnerable systems or sampling locations to warrant its being included in future Assessment Monitoring or Screening Surveys. Pre-Screen Testing will only be required after additional rulemaking.

EPA will select a limited number of systems (up to 200) to conduct Pre-Screen Testing, possibly using a random number generator, selected from up to 25 of the most vulnerable systems identified by each State, or by EPA if a State decides not to participate in the Pre-Screen Testing system selection process. Up to 200 systems, a smaller sample size than under the Screening Survey or Assessment Monitoring, are considered sufficient for this type of monitoring because monitoring will occur at systems determined to be vulnerable to occurrence of the contaminants, based on the characteristics of the contaminants, system operation, climatic conditions, and land and water resource use. This monitoring is to determine whether the contaminant can be found in any public water system under most likely occurrence conditions specific to the contaminant. This tier of monitoring is not designed to determine the extent of occurrence. A portion (e.g., 100 to 150) of these 200 systems may be a different subset of small systems serving 10,000 or fewer persons than those selected for the national representative sample. The reason for this different subset is that States should identify the systems that are representative of the most vulnerable conditions for the contaminants specified for Pre-Screen Testing. These most vulnerable systems may not be those conducting Assessment Monitoring or the Screening Survey. It is possible, though, that some overlap of systems doing Assessment Monitoring and those selected for Pre-Screen Testing could occur.

Under Pre-Screen Testing, EPA will designate or approve a laboratory or laboratories to conduct sample analysis. The reason for this testing approach is that the analytical methods expected to be used will be emerging from research development, and most laboratories will not have any experience with them. For these laboratories to utilize the new methods could involve extensive investment in equipment and training. Rather than requiring this investment for contaminants which have uncertain occurrence in public water systems, EPA will develop and promulgate appropriate methods. EPA will also require that these methods be used by designated or approved laboratories. Pre-Screen Testing analysis is conducted at systems most likely to have the contaminants to determine whether further action is warranted and additional method development is needed.

Under this approach, once EPA has developed methods and promulgated the rule to test for List 3 contaminants, it will request States to identify at least 5 and not more than 25 systems (based on the population served by PWSs in each State) most vulnerable to the listed contaminants. States will select these systems from all community and non-transient non-community systems of all sizes. Selection criteria for these systems include States' determination of systems most vulnerable to the specified contaminants and numbers of systems per State based on the population served in each size category of system. The States will send the list of systems, any modification of their State Monitoring Plans, and the reasons for their list and modifications (considering the characteristics of the contaminants, precipitation, system operation, and environmental conditions) to the EPA. EPA will select up to 200 PWSs nationwide, from the pool of State-identified vulnerable systems, that must submit samples of the specified contaminants. Some small systems selected may not be part of the national representative sample of 800 small systems selected for Assessment Monitoring. Hence, some small systems may only be required to sample for Pre-Screen Testing. States or EPA will provide instructions to the systems for the necessary sampling and subsequent shipping to the EPA laboratory. At this time, EPA believes that the contaminants for which Pre-Screen Testing will likely be required are those listed in the final rule at § 141.40(a)(3) Table 1, List 3. Sampling and testing done for Pre-Screen Testing will most likely be required in the later years of the five-year UCMR listing cycle. This approach will assist EPA in refining the methods for these contaminants. If EPA finds any substantial frequency of occurrence of Pre-Screen Testing contaminants, the contaminants could

become part of either the Screening Survey or part of Assessment Monitoring in future UCMR lists. Since the methods for these contaminants will have to be applied under highly controlled analytical conditions, EPA will pay for the shipping and analyses of these samples for small systems selected to participate. Large systems will pay for the shipping and testing of samples at EPA approved laboratories.

Public comments requested that EPA provide guidance on the selection of "most vulnerable" systems and on reporting requirements for Pre-Screen Testing. EPA plans to provide this guidance during the years 2001 and 2002, and obtain public comment before the guidance is final.

D. Monitoring Requirements Under the Final UCMR

1. Monitoring Frequency

(a) Systems Serving More Than 10,000 Persons

(i) Chemical Contaminants.

The number of persons served affects exposure to contaminants and resources necessary to monitor. The final UCMR program requires large systems serving more than 10,000 persons to monitor at each entry point to the distribution system, or other representative compliance monitoring location specified by the State, whether or not the system applies treatment. If a system applies treatment, then it must monitor after treatment. In response to public comment, EPA modified the rule to allow alternative sampling points to be used: sampling points identified by the State for compliance monitoring under 40 CFR 141.24(f)(1), (2), and (3), and/or source (raw) water sampling points, if the State uses source water monitoring as a more stringent monitoring requirement. If monitoring at source (raw) water sampling points indicates detection of any of the contaminants on the monitoring list, then the system in most cases will be required to shift its unregulated contaminant monitoring to the entry point to the distribution system. These flexibilities in the sampling location should enable systems and States to coordinate compliance and unregulated contaminant monitoring more extensively.

The law requires EPA to consider the source of water relative to unregulated contaminant monitoring requirements (SDWA Section 1445(a)(2)(A)). Over the twelve-month period of monitoring, the regulation requires that systems sample from all entry points to the distribution system, or other sampling points specified, representing all principal, non-emergency sources of water used over the monitoring period. Surface water-supplied systems will monitor each of these points every three months for a twelve-month period and ground water-supplied systems will monitor each of these points two times five to seven months apart within a twelve-month period. Today's final monitoring frequency for surface water systems is the same as in the previous program. For ground water systems, the two sampling events must be approximately six months apart, increasing the frequency from one sample in five years under the previous program to two. The reasons for this increase are that while ground water typically moves slowly, one sample is insufficient to characterize water quality at any particular location and will not provide evidence of any changes over a longer period of time. Furthermore, some ground water environments transmit water more rapidly, potentially resulting in changes in water quality over shorter timeframes. From a statistical standpoint, one sample is not representative and will not allow the data to be used for exposure assessment which uses an average annual value. This frequency applied to the average of 6.2 entry points to the distribution system for systems serving more than 10,000 persons will provide sufficient data for an adequate statistical analysis of the varied conditions in which these systems are located.

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 rationale for this approach is that it provides data representing potential variation in contaminant concentration over the course of a year. This potential variation in concentration is necessary to evaluate exposure related to contaminant occurrence. Some systems perform compliance monitoring on a quarterly basis and can collect UCMR samples coincident with their compliance samples, and therefore provide data on the range of variation. Other systems may only conduct compliance monitoring once every third year and will therefore have to collect additional samples under the UCMR. While one UCMR sample could be collected coincident with this compliance sample, EPA is requiring for ground water-supplied systems to take a second sample five to seven months later. This requirement will provide the necessary data on seasonal variation over a year to allow consistent exposure assessments to be done with a range of concentrations. Stakeholders supported this option. EPA originally proposed that the second sample be collected exactly six months later. State commenters indicated a need to provide flexibility to accommodate changes in monitoring schedules. Therefore, EPA modified the regulation to allow monitoring five to seven months before or after the initial vulnerable period sampling event.

(ii) Microbiological Contaminants

For microbiological contaminants, the sampling frequency will be two times within one year, with samples collected each time at two different locations after treatment in the distribution system: a site representative of water in the distribution system received by the general population that the system serves and a site in the distribution system representing the maximum residence time or lowest disinfectant residual, depending on the contaminant. The frequency should capture the most vulnerable time as well as a time five to seven months later to provide an average exposure. Furthermore, precipitation patterns may be a major factor in contaminant occurrence. Thus, frequency of sampling should be tailored to the most vulnerable times because increased seasonal precipitation may carry these contaminants at higher concentrations than other times during the year.

(b) Systems Serving 10,000 or Fewer Persons

The final rule states that approximately one third of the small systems (serving 10,000 or fewer persons) selected through the representative sample, be sampled each year over a three-year period at the frequencies indicated in Section D, "Monitoring Requirements Under the Final UCMR" (1)(a) above. This allows a relatively even submission of samples to be managed and tested by the EPA laboratory. EPA will pay for the reasonable costs of monitoring (i.e., containers, shipping, testing and reporting) for this representative sample of systems, including Assessment Monitoring, Screening Survey, and Pre-Screen Testing, and will conduct the analyses at its designated laboratories. EPA, therefore will need to be able to manage the number of samples being received at any time to closely correspond to the analytical capacity of its laboratories. Some public commenters suggested that sampling for microbiological contaminants not occur at the maximum residence time in the distribution system, but at the point of lowest disinfectant residual, since the

monitoring of concern is for effectiveness of treatment and booster disinfection stations that may be in use in long distribution lines. In response, EPA added another sampling point at the "lowest disinfectant residual" in the distribution system. However, EPA maintained the original sampling point location of "maximum residence time" because, given potential chemical degradation over long periods of time in a distribution system, such as for disinfection byproducts, the location of maximum residence time can often be the location of lowest disinfectant residual and, therefore, highest likelihood of microbiological contaminants.

Public comments also addressed the flexibility in monitoring schedules to allow for unforeseen events or factors in field sampling. Specifically, States asked that system sampling schedules allow for sampling over a month within a quarter, rather than exactly three months later. EPA modified the final rule to allow sampling by small and large surface water systems to occur within the same month in each quarter and for small and large ground water systems, to occur any time five to seven months before or after the initially selected month within the vulnerable time.

2. Monitoring Time for Vulnerable Period

Water quality studies and monitoring throughout the United States have clearly shown that contaminant occurrence and/or concentration vary over time, both seasonally as well as from year to year. The seasonality of occurrence, or period of peak concentration of contaminants, commonly varies with seasonal changes in the hydrologic cycle in relation to the source of contaminants and their fate and transport characteristics. Particularly for land-applied or land-disposed contaminants, the increased flux of water mobilizes the contaminants and moves them into surface or ground water flow systems. For the most vulnerable of water systems, such as surface waters, unconfined shallow ground water and karst flow systems, for example, higher levels of contaminant concentrations typically occur during annual runoff and recharge periods. For much of the United States, east of the Rocky Mountains, many studies have shown that the season of greatest vulnerability for contaminant occurrence is the late-spring, early-summer runoff-recharge period, particularly for contaminants such as pesticides and nitrate (e.g., Larson et al., 1997; Barbash and Resek, 1996; Hallberg, 1989a,b). For deeper, more confined ground water systems, defining vulnerable periods is much more difficult. The exact flow path and time of travel are much greater and more complex and are dependent upon many factors unique to a particular well and aquifer setting (e.g., Hallberg and Keeney, 1993). There is no generality that can be applied to these latter settings.

Because occurrence may vary seasonally, it is important to try to capture these vulnerable periods in a one-time survey of contaminant occurrence such as the UCMR. Statistical studies of sampling strategies in surface water (e.g., Battaglin and Hay, 1996) have shown that incorporating sampling during spring and early summer runoff periods provides a more accurate representation of annual occurrence than random quarterly sampling (that can avoid these months). Ground water studies (e.g., Pinsky et al., 1997) suggest that the more vulnerable ground water settings also show peaks during these periods. The default vulnerable period for sampling for the UCMR has been designated to coincide with this period of peak vulnerability for much of the United States: one sample must be collected during May, June, or July, unless the State has better information to designate another period. Also, for surface waters, three additional samples will be collected throughout the year, and for ground water systems, one additional sample will be collected five to seven months before or after the vulnerable time. This additional sampling will also capture the winter recharge and runoff period that may be more vulnerable in the western coastal regions or warmer southern climates for some contaminants. In the case of some deeper ground water systems, States or systems may have additional knowledge of seasonal vulnerability patterns, in which case the State can designate an alternative period for sampling.

Public comments generally supported monitoring in a vulnerable time, but desired flexibility in establishing the time and frequency. The rule already provided flexibility in selecting a time within the May to July period for a sampling event. However, because the statistical approach requires consistency, today's rule enables a State to determine the alternate vulnerable time for monitoring, rather than each system using its own criteria for choosing a vulnerable time. With respect to frequency, the statistical approach requires that systems monitor with the same frequency so that a national frequency distribution can be developed. This precludes the State or a system from establishing its own monitoring frequency.

Two commenters indicated that pumping rate and not hydrologic factors accounted for variations in contaminant concentration, with higher pumping rates coinciding with higher concentrations. No specific data were offered in support of these comments. EPA believes that many factors may account for higher contaminant concentrations during certain seasons. While pumping rate may be a factor, hydrologic factors are documented as having a significant influence in concentrations of pesticides and other contaminants, as noted previously. A State may use pumping rates as a basis for designating an alternative vulnerable time if determined appropriate.

3. Monitoring Location

In § 141.40(a)(3), today's action identifies entry points to the distribution system (EPTDS) after any treatment, or the sampling points specified by the State for compliance monitoring under 40 CFR 141.24(f)(1), (2), and (3), representative of each principal, non-emergency water source in use over the twelve-month period of Assessment Monitoring, as the sampling locations for List 1 contaminants. Also, two sites in the distribution system (a site representative of water in the distribution system received by the general population that the system serves and a site in the distribution system representing the maximum residence time or the lowest disinfectant residual) are designated for microbiological or distribution system contaminants. Sampling at entry points to the distribution system after any treatment follows the existing regulatory approach for currently regulated contaminants and provides data for exposure assessment.

(a) Chemical Contaminants

The chemicals in this final rule (UCMR (1999) List 1) are all compounds that can enter a public water supply from the external environment (in contrast to disinfection byproducts, for example). The monitoring location is at the entry point to the distribution system after treatment, representative of each principal non-emergency source of water in use over the twelve-month monitoring period, which will ensure a nationally consistent data set and will provide consistent data for exposure assessment. In response to State and water system commenters, EPA also provided flexibility in the final rule to allow sampling of source (raw) water sampling points. However, if a listed contaminant is detected through source

water sampling and testing, then the monitoring location must be shifted to the entry point to the distribution system (unless there is no treatment) and follow the monitoring frequency specified in the rule for the contaminant and water source type.

(b) Microbiological Contaminants

The sampling locations for microbiological contaminants are different from those for chemical contaminants because the most likely locations with microbiological contaminants may be in the distribution system, or, for some systems, in source water. Two sampling locations were considered in the development of this regulation and are included in the reporting requirements under 40 CFR 141.35(d). No microbiological contaminant is on List 1 for Assessment Monitoring so the two sampling points are not now required. When microbiological contaminant monitoring is required, one of the samples will be at the site below a representative entry point to the distribution system that is used for taking total coliform samples; this sample will represent general exposure. The second sample will be in the distribution system that has the maximum residence time or lowest disinfectant residual, representing the extreme exposure of the population at this point in the distribution system. These sampling points were suggested by stakeholders. EPA will consider activating these sampling points for microbiological contaminants when their analytical methods are determined to be ready for Assessment Monitoring, Screening Survey or Pre-Screen Testing through separate rulemaking. Over the twelve-month period of monitoring, systems would sample at locations representing each principal, non-emergency source of water used over the monitoring period, to the extent possible. One commenter suggested that distribution system samples be taken at sites used for sampling total trihalomethanes (TTHMs). EPA will consider TTHM sites when it proposes methods for microbiological contaminants or other contaminants likely to occur in distribution systems.

Currently, it is not possible to assess whether or not all of the microbiological contaminants (including those on List 3) are likely to be found at any one sampling location, or that one sampling location is best to potentially identify all microbiological contaminants. The occurrence data needs may differ for different contaminants. Different portions of the water supply and distribution system may be more likely locations of particular microbiological contaminants/occurrences. Therefore, the sampling location for each microbiological contaminant may need to be contaminant-specific and related to the likelihood of occurrence.

As a result, for the microbiological contaminants on Lists 2 and 3 of the rule today, EPA has not identified a sampling location or locations. For some of the microbiological contaminants, source water may be the most appropriate sampling location. EPA will specify sampling locations at the time public comment is requested on the specific monitoring requirements for microbiological contaminants.

4. Quality Control Procedures for Sampling and Testing

To assure that the data collected under this final regulation are of sufficient quality to meet the requirements of its intended uses, EPA is requiring the use of the analytical methods and procedures in § 141.40(a)(3), (4), and (5) and Appendix A for monitoring. Also, additional guidance for quality control and analytical confirmation are specified in the "UCMR Analytical Methods and Quality Control Manual", available by the time this rule is published. This final regulation covers quality control steps for all sampling and testing under this program. Today's final rule requires that all monitored systems follow these methods and procedures in organizing and conducting their UCMR sampling and testing. Systems must also ensure that the laboratories they use to analyze samples use these approved methods and procedures. The specific quality control requirements addressed in § 141.40(a)(3), (4) and (5) and Appendix A of the final rule include: sample collection/preservation; sample transport; sample and sample extract holding time and storage; sample analyses/quality control requirements, including quality control (QC) requirements, calibration, calibration verification, laboratory reagent (method) blank, quality control sample, laboratory duplicates, sample matrix spike and matrix spike duplicate, internal standard, surrogate standard, method detection limit determination, minimum reporting level; confirmation; and reporting requirements. EPA believes that specifying the quality control requirements for UCMR sampling and testing will enable the Agency to have a high degree of confidence in determining the extent and range of concentrations for the contaminants on the UCMR (1999) List, since they are not regularly tested for nationally.

5. Monitoring of Routinely Tested Water Quality Parameters

In addition to the contaminants to be monitored, several chemical and physical parameters are important indicators of water quality and may contribute to the likelihood of contaminants being found in drinking water. EPA requested public comment on whether it should require the monitoring and reporting of these routinely tested parameters, usually associated with water quality analyses, to provide for a more thorough scientific understanding of the occurrence of unregulated contaminants. These chemical and physical parameters are not added to the UCMR (1999) List because they are not contaminants, but rather they provide supplementary data about the sample results which will facilitate their interpretation and use in regulatory decisions. Public comments indicated that for some systems and States, these chemical and physical parameters are routinely tested for, and in others, they are not. One commenter stated that temperature and pH were important for chemical contaminant occurrence and degradation. Another commenter indicated that analyzing for these water quality parameters is essential to managing his system's water. In response, EPA has revised the rule to require that for organic and inorganic chemical samples, pH be reported for the sampling event of each sampling point. Since no supporting information was provided, EPA determined that while temperature may be important for microorganisms, it is not expected to affect the results for chemical contaminants because the storage and transit temperature requirements in the approved methods will minimize the loss of target contaminants due to any physical, chemical or biological processes. For microbiological contaminants, temperature, pH, free disinfectant residual, and total disinfectant residual must be reported. These required water quality parameters are listed in § 141.40 (a)(4)(i) Table 2, Water Quality Parameters To Be Monitored With UCMR Contaminants. These water quality parameters must be reported as analytical results along with other results and data elements.

6. Relation to Compliance Monitoring Requirements

Currently, compliance monitoring for regulated contaminants is coordinated on a three-year cycle. All public water systems that are required to monitor for specific contaminants a minimum of one year out of every three, six, or nine

years, depending on the contaminant and its occurrence in the system. The existing unregulated contaminant monitoring requirements and the final revised UCMR require monitoring during one year out of every five years. EPA provides flexibility in this final UCMR so that public water systems: (a) only have to monitor for unregulated contaminants during one twelve-month period every five years (unless the State, at its discretion, determines that PWSs should conduct more frequent monitoring); (b) can use previously State-specified compliance sampling points, including source water sampling points; and (c) choose a sampling time within quarters or three-month periods specified in the rule. Hence, the compliance monitoring and the UCMR monitoring can be coordinated, to the extent practical, by conducting UCMR monitoring during a coincident year during which compliance monitoring is required. The years within which the unregulated contaminant monitoring are required to occur are specified in § 141.40(a)(3), Table 1, Unregulated Contaminant Monitoring List, column 6.

7. Previous Monitoring of the Contaminants on the Final UCMR (1999) List

Some PWSs may already have monitored for or want to monitor before the rule's effective date of January 1, 2001, for some of the contaminants identified on the final UCMR (1999) List because of local or State concerns about the possibility of those contaminants occurring in drinking water. At the time of proposal, EPA was concerned about allowing systems to report monitoring results for samples taken and tested prior to promulgation of the UCMR. EPA was concerned that such results might not be comparable to results obtained under this revised UCMR Program because of differences in sampling and analytical protocols, as well as the sampling schedule. Other factors thought to compound the problem of comparability included: (1) monitoring methods may have changed or improved; (2) water quality changes over time; and, (3) today's action requires reporting of a net increase of seven additional data elements, which will allow various, consistent comparisons to be made and data to be aggregated nationally based on current sound-science and quality assurance/quality control consistency. However, EPA received comments recommending that previously collected data should be accepted for the unregulated contaminants on the monitoring list as long as they meet all the requirements of this final rule. In response, EPA reevaluated the circumstances under which previously collected (also referred to as "grandfathered" or "grandparented") data could be accepted, given the statistical and quality assurance/quality control requirements of the UCMR Program. EPA has modified the regulation to allow previously collected data to be reported, as long as the data meet the sampling, testing and reporting requirements specified in 40 CFR 141.35(d) and 141.40(a)(3), (4), (5) and Appendix A. This change will allow for early monitoring and reporting for MTBE, as long as it meets the requirements of the UCMR. By doing so, EPA is responding to one of the recommendations of the Blue Ribbon Panel on Oxygenates in Gasoline, a panel appointed by EPA Administrator Browner, to evaluate the issues posed by the use of MTBE in gasoline. This recommendation consisted of accelerating the implementation of the UCMR, by allowing systems to sample for MTBE prior to the implementation date of January 1, 2001.

E. Waivers

1. Waivers for Systems Serving More Than 10,000 Persons

Section 1445(a)(2)(F) of SDWA allows a State to obtain a waiver of UCMR monitoring for specific contaminants if the State demonstrates that the UCMR listing criteria do not apply in that State. These criteria are:

(a) the criteria for listing a contaminant in the occurrence priorities list in the CCL or the regulatory process identifying contaminant occurrence in two or more States; and

(b) whether an analytical method exists for the contaminant.

When a State makes such a demonstration for a waiver of a specific contaminant on the monitoring list, EPA may waive monitoring for that contaminant in that State for large systems (serving more than 10,000 persons) only.

Stakeholders indicated that waiver requirements should be sufficiently stringent to obtain the most representative national data possible, including non-detections of contaminants on the UCMR (1999) List. Since only the UCMR listing criteria in (a) are relevant to a State-specific waiver and based on stakeholders' concern that the waiver be narrowly applied, EPA is requiring that this waiver be applied only where the State can demonstrate that the contaminant has not been used, applied, stored, disposed, released, or detected in the source waters or distribution systems in the State in the past 15 years and that the contaminant does not occur naturally (such as growth in a system or air deposition) in the State. Source Water Assessments provided for under Sections 1453 and 1428(b) of SDWA may be used as the basis for these waivers if the assessments specifically address the contaminant(s) on the UCMR List for which a waiver is sought. Table 3, Uses and Environmental Sources of Contaminants for the Monitoring List, presents the uses and sources of the contaminants included for the final UCMR (1999) List. A State can apply for a waiver from monitoring for specific contaminants, but must receive EPA approval to waive the monitoring.

While some chemical contaminants may only be discharged into the environment in regional or local areas, microbiological contaminants may be ubiquitous. However, previous monitoring results over time may provide information useful to waiver determinations for microbiological contaminants.

Public comments on system-specific waivers ranged from not allowing waivers for any systems to providing waiver procedures for individual systems. EPA decided that such waivers are not provided by the statute and would be generally inconsistent with the nature of a program that relies on nationally representative data. Detections and non-detections are equally important in deciding whether to regulate a contaminant. If waivers are given to systems not expected to have occurrence of a particular contaminant or group of contaminants, then the resulting data set will be biased toward systems having detections, potentially contributing to an incorrect conclusion about contaminant occurrence and regulation. EPA did not change the rule to allow other circumstances under which contaminant monitoring waivers could be given.

2. Waivers for Small Systems in State Plans

EPA is not allowing waivers to be granted for small systems serving 10,000 or fewer persons in State Plans for the national representative sample. Stakeholders also supported this position. The systems in State Plans will be statistically selected with the assumption that all systems in a particular size category and water source type have an equal probability of being selected. Non-detections are just as important as detections of contaminants for national analysis. Waiving contaminants to be monitored in certain States not expecting to have such contaminants biases the

representative sample toward detections. Selecting the small systems to be included in the State Monitoring Plans for the representative sample through a statistical process effectively waives ninety-seven percent of the systems from the final monitoring requirements (based on using 99 percent confidence level with three percent allowable error). Therefore, EPA rejected waivers for systems serving fewer than 10,000 persons because this approach is contradictory to obtaining a scientifically sound data set that provides the basis for a scientific statistical analysis. The rule was not changed in this regard.

TABLE 3.—USES AND ENVIRONMENTAL SOURCES OF CONTAMINANTS FOR THE MONITORING LIST

Contaminant name	CASRN	Use or environmental source
Proposed Chemical Contaminants		
1,2-diphenylhydrazine	122–66–7	Used in the production of benzidine and anti-inflammatory drugs.
2-methyl-phenol	95–48–7	Released in automobile and diesel exhaust, coal tar and petroleum refining, and wood pulping.
2,4-dichlorophenol	120–83–2	Chemical intermediate in herbicide production.
2,4-dinitrophenol	51–28–5	Released from mines, metal, and petroleum plants.
2,4-dinitrotoluene	121–14–2	Used in the production of isocyanate and explosives.
2,4,6-trichlorophenol	88–06–2	By-product of fossil fuel burning, used as bactericide and wood/glue preservative.
2,6-dinitrotoluene	606–20–2	Used as mixture with 2,4-DNT (similar uses).
Acetochlor	34256–82–1	Herbicide used with cabbage, citrus, coffee, and corn crops.
Alachlor ESA		Degradation product of alachlor, an herbicide used with corn, bean, peanut, and soybean crops to control grasses and weeds.
DCPA di-acid degradate	2136–79–0	Degradation product of DCPA, an herbicide used on grasses and weeds with fruit and vegetable crops.
DCPA mono-acid degradate	887–54–7	Degradation product of DCPA, an herbicide used on grasses and weeds with fruit and vegetable crops.
DDE	72–55–9	Degradation product of DDT, a general insecticide.
Diazinon	333–41–5	Insecticide used with rice, fruit, vineyards, and corn crops.
Disulfoton	298–04–4	Insecticide used with cereal, cotton, tobacco, and potato crops.
Diuron	330–54–1	Herbicide used on grasses in orchards and wheat crops.
EPTC	759–94–4	Herbicide used on annual grasses, weeds, in potatoes and corn.
Fonofos	944–22–9	Soil insecticide used on worms and centipedes.
Lead-210 (Pb-210)	14255–04–0	Part of the uranium decay series, naturally occurring.
Linuron	330–55–2	Herbicide used with corn, soybean, cotton, and wheat crops.
Molinate	2212–67–1	Selective herbicide used with rice, controls watergrass.
MTBE	1634–04–4	Octane enhancer in unleaded gasoline.
Nitrobenzene	98–95–3	Used in the production of aniline, which is used to make dyes, herbicides, and drugs.
Perchlorate	14797–73–0	Oxygen additive in solid fuel propellant for rockets, missiles, and fireworks.
Polonium-210 (Po-210)	13981–52–7	Part of the uranium decay series, naturally occurring.
Prometon	1610–18–0	Herbicide used on annual and perennial weeds and grasses.
RDX	121–82–4	Used in explosives; ammunition plants.
Terbacil	5902–51–2	Herbicide used with sugarcane, alfalfa, and some fruit, etc.
Terbufos	13071–79–9	Insecticide used with corn, sugar beet, and grain sorghum crops.
Microbiological Contaminants		
Adenoviruses	N/A	Fecal sources; hand to mouth transmission.
Aeromonas	N/A	Present in all freshwater and brackish water.
Cyanobacteria (Blue-green algae), other freshwater algae and their toxins.	N/A	Bloom in surface water bodies; produce toxins.
Caliciviruses	N/A	Contaminated food and water, raw shellfish.
Coxsackieviruses	N/A	Fecal sources; hand to mouth transmission.
Echoviruses	N/A	Fecal sources; hand to mouth transmission.
Helicobacter pylori	N/A	Fecal sources; hand to mouth transmission.
Microsporidia	N/A	Occur in rivers, ponds, lakes, and unfiltered water.

F. Representative Sample of Systems Serving 10,000 or Fewer Persons

As required by section 1445(a)(2)(A) and (C), the regulation requires that only a representative sample of public water systems serving 10,000 or fewer persons must monitor for unregulated contaminants. As previously explained, only community and non-transient non-community systems are required to monitor for unregulated contaminants under this action. Therefore, the representative sample will include only community and non-transient non-community systems serving 10,000 or fewer persons. The representative sample must be of sufficient size to gather the necessary information on occurrence of unregulated contaminants to determine whether or not to regulate them, while not burdening every water system with the expense of monitoring. The number of systems selected within each of three size ranges of small systems will be based on the proportion of the State's population served by systems in that size range. (An example appears in Section 5.(a), "State Plans for the Representative Sample".) The small systems in the national representative sample will be selected using a stratified random sampling process. This process will utilize a random number generator to choose a statistically determined number of systems in each State, considering the proportion of the population served by CWSs and NTNCWSs by water source type (i.e., ground or surface water) and system

size category (i.e., 25 to 500 persons, 501 to 3,300, and 3,301 to 10,000) within the water source type. The regulation stipulates that the national representative sample is the basis for the State Monitoring Plan in each state. The use of this statistical approach is designed to take into account different system sizes, types of systems, the source of supply, contaminants likely to be found, and geographic location. EPA believes that the statistical process for selecting systems to monitor must yield data that are sufficient to answer questions about occurrence of contaminants on a national scale for use in exposure assessments and technology evaluations of alternative treatments at a PWS and in its watershed. These data should also be sufficient to answer questions on a broad multi-state scale, such as systems classified by size or source of water, particularly when combined with data for the 2,774 large systems.

Under this action, small system monitoring will be too sparse to answer questions about occurrence at the scale of a single State. The number of systems required for evaluation of occurrence in a single State is far greater than, and thus more costly than, those needed for the broader national evaluations required under the Act to determine whether or not to regulate a contaminant and to assist in developing future drinking water regulations.

1. System Size

Based on statistics reported in the Safe Drinking Water Information System (SDWIS) database, the following numbers of systems (1997 data) by size will approximate the universe from which a representative sample of systems serving 10,000 or fewer people will be taken for the national representative sample plan. These system size categories are used in other statutory and regulatory characterizations of systems, and are applied under the existing rule for unregulated contaminant monitoring for the scheduling of sampling. The relevant system and population information (1997) for systems serving 10,000 or fewer persons is:

No. of people served in PWS size range	No. of PWSs in size range	Population served nationally	
		CWS	NTNCWS
25–500	48,100	5,249,577	2,379,034
501–3,300	14,126	19,918,106	2,724,728
3,301–10,000	3,410	25,236,059	401,579
Total	65,636	50,403,742	5,505,341

Considering all community water systems and nontransient non-community water systems that do not purchase their water supplies, 65,636 PWSs are in the size range for small systems as defined in Section 1445. In response to public comments that indicated the appropriateness of including purchased water systems, EPA revised this rule to cover systems purchasing water from other systems if their distribution systems are the locations of the maximum residence time or lowest disinfectant residual in relation to the combined water seller-purchaser distribution system. Purchased water systems will not be required to monitor for contaminants for which the sampling location is specified as the entry point to the distribution system because they could bias results by potentially causing double counting of contaminant occurrence.

2. System Type

(a) Public Water System Monitoring

Under today's action, all public water systems serving 10,000 or fewer persons, except transient non-community systems, will be considered for monitoring, but only a subset will be selected for the national representative sample. Purchased water systems will be excluded from UCMR monitoring for contaminants where the sampling point is identified as the entry point to the distribution system. Public water systems owned and/or operated on Tribal lands by Tribes will have the same probability of being selected for the national representative sample as any other system in its water source-system size category. EPA will identify the size of the representative sample and the specific systems required to monitor and send the list of systems to the States for review and inclusion in State Monitoring Plans (discussed in Section V. F. 5).

(b) Nontransient Non-Community Water Systems

Nontransient non-community water systems (NTNCWSs) represent schools, hospitals and other facilities in communities that serve the resident population but have their own water supply systems. Approximately 20,000 systems of this type exist in the United States. Today's final regulation at § 141.40(a)(1)(iii) includes NTNCWSs as a separate type of water system to be included in the representative sample for monitoring. Typically, these systems are closely associated with a local resident population and may be a significant source of water consumed by that population over a lifetime. The selection of NTNCWSs will use the same statistical process as for CWSs, with systems grouped within a State by water source type and size category. NTNCWSs are considered separately to avoid double-counting the population served when conducting exposure assessments of both small CWSs and NTNCWSs, while allowing weighting of lifetime water consumption by system type.

(c) Transient Non-Community Systems

Transient non-community water systems represent systems providing drinking water to transient populations such as at a restaurant in a rural location or a highway roadside rest area. About 97,000 of these systems exist in the United States; their location and type are highly variable. It will be difficult to extrapolate exposure from monitoring results, given the very short-term nature of the systems' use by individuals who may not be in the area for more than a few hours or days. Because of problems with implementation and cost for sampling such a large and highly variable set of typically very small systems, EPA has excluded transient systems from all unregulated contaminant monitoring requirements in this final rule. In this regard, this action is consistent with the current UCMR Program. Four of the five public commenters addressing transient systems supported exclusion of transient systems from requirements for unregulated contaminant monitoring.

3. Geographic Location

SDWA Section 1445 specifies that State plans should consider "geographic location" when selecting a representative sample. This is

accomplished at the broadest level by selecting systems from each State. However, within a State, the sources of water may not be evenly distributed across that State, especially surface waters. Cities transfer water across watershed boundaries, or move water from one State to another. To best represent water being consumed by individuals, EPA defines "geographic location" in the representative sample for the final rule today as the location of the source of water, rather than as an even distribution of points across the State. For example, if 40 percent of the people in a State obtain their water from one water source type (e.g., surface water), 40 percent of the systems selected for the representative state sample should be from that source type, even if this results in points unevenly distributed across the State. This distribution should be accommodated by allocating systems based on the population served nationally and in each State stratified by water source and system size category.

4. Likelihood of Finding Contaminants

Section 1445(a)(2)(A) requires that the UCMR Program take into account the likelihood of finding a contaminant in establishing variable monitoring requirements for systems. The final rule allows the UCMR Program to focus on monitoring for contaminants that are expected to be found nationally or within several regions of the United States. Therefore, the expectation of finding the contaminants nationally is fundamental to the approach of the representative sample and its statistical method of selection. The "likelihood of finding contaminants" factor is accommodated by the step-wise three-tiered approach of Pre-Screen Testing, Screening Survey and Assessment Monitoring.

5. State Plans for the Representative Sample

As discussed previously, Section 1445 (a)(2)(C) allows States to develop State Monitoring Plans (also referred to as "State Plans") to assess the occurrence of unregulated contaminants for small systems in the State. EPA believes that the development of State Plans is affected by two other considerations: (i) the State plans must fit together into a national representative sample so that it is, in fact, nationally "representative," and (ii) EPA will pay for the reasonable costs of testing and laboratory analysis necessary to carry out monitoring at State Plans, pursuant to Section 1445(a)(2)(C)(ii).

(a) Representative State Plans

To have representativeness at the national level while at the same time allowing each State to develop a "State Plan," the testing for which EPA will fund, the Agency will take the following approach. Based on a statistical random selection process applied to all CWSs and NTNCWSs nationally using the average population served by systems and water source type (surface or ground water to ensure geographic coverage) within service-size categories (25–500, 501–3,300, 3,301–10,000 persons), EPA will select at least twice as many CWSs and NTNCWSs as required for the national representative sample. EPA will use a random number generator to select these systems. These systems will be divided into an "initial plan" list and a "replacement list" to allow for replacement of systems on the list with systems from the replacement list, by States. The representative sample will be allocated on a State basis, and then stratified by water source type and then by service size category within each water source type. EPA will use the percentages of the populations served in each water source-system size category to further allocate the systems in each State. The "initial plan" list of systems will identify those systems tentatively selected by EPA for each State. To establish a State Plan for small system monitoring, a State may enter into a Memorandum of Agreement (MOA) with EPA to take a partnership role in the development and implementation of the State Plan. By agreeing to participate in the process for the State plan through the MOA, the State must accept the EPA-selected systems on the "initial plan" as its plan, or review the list to determine which systems should be removed from the list because of such factors as closure, merger, or water purchase arrangement and submit a modified plan. The State must replace the system(s) they remove from the list with the water system(s) from the "replacement list" in the order the systems are listed in the replacement list, thus creating a "modified plan." The State, in either case, must inform the EPA of the State's choice of plan (i.e., "initial" plan or "modified" plan) along with reasons for removing and replacing systems on the "initial plan" within 60 days of receiving the "initial plan." If the State decides not to enter into an MOA with EPA for the State Plan process, then the EPA will consult with the State before the State adopts the "initial plan" as its State Plan. In a State with an MOA, the State Plan will include a process for the State to inform the public water systems of their responsibility to monitor and report results, their vulnerable time period, other monitoring times, sampling instructions, and of their participation in the screening survey and pre-screen testing. The EPA will inform systems of their inclusion in the representative sample if the State chooses not to enter into an MOA for the State Plan. This approach ensures a nationally representative set of systems and allows a State flexibility to modify EPA's "initial plan" with minimal burden. EPA will develop and provide initial plans to States and Tribes in the first half of year 2000 to allow sufficient time for State/Tribal review and modification, and for informing systems selected for the State Plans.

Statistical Approach. Under today's action, the representative sample of small public water systems will be composed of a subset of systems which, in the aggregate, represent the public water systems of the three small system size categories within the United States. Within a State, public water systems will need to be selected so that the proportion of persons served by the systems sampled is as close as possible to the proportion of persons served by that system size category within each water source type for that State. The portion of the national representative sample within a State's boundaries will become that State's Monitoring Plan, after review and possible adjustment by the State, and then EPA review.

For the small systems considered, a representative sample size of approximately 800 systems will provide a confidence level of 99 percent with an allowable error of plus or minus 1 percent. This number of systems is statistically derived to allow population weighting for exposure assessment. Because of population weighting in the selection of the representative sample, systems are a surrogate for the number of people being monitored for unregulated contaminants in their drinking water. Since population exposure assessment is the principal use of the data in the regulation development process, the quantity of interest is the fraction of people exposed, rather than the fraction of systems affected. However, the law requires measuring contaminant occurrence at systems and it is more efficient to measure at systems. So the population weighted plan allows EPA to recognize systems providing drinking water to their service population as a surrogate for people. When the goal is exposure assessment, then a population weighted sampling plan for systems is optimal. The results can also be used to

estimate the number of systems affected, although the selected population weighted plan is not optimal for this purpose.

The results will also be useful for analysis of contaminant occurrence at small systems in national analyses by water source and system size categories or strata, with a confidence level of 95 percent and a one percent margin of error. EPA will allocate systems to each State, water source type and system size category by: (1) estimating the population served by all small CWSs in each State, (2) dividing this population into the population served in each water source type-system size combination to derive a percentage, and (3) multiplying the percentage by the number of small systems in the State, with the result being the number of systems allocated to each water source-system size category. This allocation is a statistical stratification of systems by water source type and system size category. The approach ensures that each State has systems allocated to it for its State Plan. To accomplish this allocation of systems to each State, EPA will add a sufficient number of small CWSs and NTNCWSs to the statistically derived number for the representative sample to allow each State to have a plan that will then fit into the national representative sample, with each State having at least two systems. Once monitored, the results of the representative sample of small systems will then be combined with large system results in an overall national analysis of contaminant occurrence in systems. EPA believes that this sample size will provide an adequate level of confidence, considering size, type (community and non-transient non-community water systems), geographic location (State), and water source. EPA also believes that this approach provides sufficient information for the decision processes drawing on UCMR monitoring data for systems serving 10,000 or fewer persons, while keeping testing costs at a manageable level. This number of systems should be sufficient to statistically evaluate whether a contaminant occurs in a specified proportion, such as 2 or 3 percent of the population (using systems as a surrogate). This number of systems, confidence level and allowable error will enable EPA to: (1) evaluate the statistical significance of contaminant occurrence with low frequency and (2) compute the percent of systems for occurrence nationally, combining the results of both small and large systems.

Further rationale for using a small number of systems and small allowable error (confidence interval) in calculating the number of systems to be included in the representative sample is provided in the monitoring results from previous unregulated contaminant monitoring under the existing program. EPA has results from over 28,000 systems from the unregulated contaminant monitoring activities of 1988 to 1992 (the first round of unregulated contaminant monitoring under the existing program) that indicate that of the 34 contaminants required to be monitored at that time, 30 occurred at less than 2 percent of systems and, of those, 27 occurred at less than 1 percent of systems. Ten of these contaminants were selected for the Contaminant Candidate List "Regulatory Priorities" (see 64 FR 23403) and all of the ten contaminants occurred at less than 2 percent of systems and eight, at less than 1 percent. Of the eight contaminants occurring at less than one percent of systems, four have health effects values within the concentration range of contaminant occurrence (bromomethane [a pesticide], 1,3-dichloropropene [a pesticide], hexachlorobutadiene [a solvent], and 1,1,2,2-tetrachloroethane [a solvent]), and consequently may be considered for future regulation. These data point at the need to focus at the low end of occurrence. Using a small allowable error minimizes the chance of EPA incorrectly deciding whether or not to regulate a contaminant based on occurrence. Once EPA evaluates health effects data, contaminant occurrence among States and systems, contaminant sources, treatment technologies, and other relevant information, the small allowable error allows EPA to make regulatory determinations with a high degree of confidence.

If, based on prior information (e.g., from a Screening Survey or Pre-screen Testing), EPA determines that the listed contaminants occur in a different percent of systems at a different statistical confidence level and/or allowable error providing scientifically defensible monitoring results, then EPA may apply a different likely percent of systems, confidence level, and/or allowable error to determine a smaller representative sample size. The statistical approach for specifying the number of systems by water source type (ground water, surface water or ground water under the direct influence of surface water) and systems size is as follows:

The number of systems, n, required in the representative sample is determined by the allowable error ($\pm d$) around the estimate for p, the proportion of systems (a population-weighted surrogate for people) which exceed a criteria (e.g., detection level) of interest. Based on the binomial distribution in statistics, the number of systems n which must be sampled for a likely proportion p of people (systems as a surrogate) with contaminant occurrence within the allowable error d with confidence $(1 - a)$ is approximately:

$$n = \frac{z^2_{(a/2)} p(1-p)}{d^2} \qquad (1)$$

The number of systems to be sampled, n, does not depend on the total number of systems available. The number from the standard normal distribution, z, is obtained from a table of the standard normal distribution, representing a collection of data following a "bell-shaped curve" which have a (standardized) mean of zero and standard deviation of one. The significance level, a, is the chance of the statistical interval of interest not containing the true value of the number being estimated, which, in this case, is the percent of systems where contaminants of concern on the UCMR List occur. The true value for the percentage of systems where contaminants of concern occur can only be known if all systems are sampled, which is not a possibility since Section 1445(a)(2)(A) requires that only a representative subset of small systems be required to monitor for unregulated contaminants. Using this equation (1), the matrix below presents the required sample sizes for several values of allowable error margins and confidence levels. For the national representative sample, an allowable error of ±0.01 at a confidence level of 99 percent and a likely proportion of systems with contaminant occurrence of 1 percent was chosen. The possibilities for sample size, confidence level and allowable error considered in developing this approach are:

SAMPLE SIZES FROM A UNIVERSE OF 65,600 SYSTEMS BASED ON: CONFIDENCE LEVEL

Confidence Level (1-*a*)	*d*, Allowable Error			
	.03	.02	.01	.005
90%	30	67	266	1,065
95%	42	95	380	1,521
99%	73	165	659	2,636

EPA believes that a representative sample size of 659 systems to be sufficient to draw conclusions about contaminant occurrence for small systems, based on 99 percent (.99) confidence level, ± a 1 percent (.01) allowable margin of error (confidence interval), and target percent of contaminant occurrence in 1 percent of systems. EPA chose a confidence level of 99 percent because it wanted high confidence that the true proportion was included in its sample results. A 5 percent chance that the window of error did not include the true proportion was considered too large, given the amount of money invested in monitoring and regulatory decisions. Based on the monitoring program, a 1 percent risk (100 − 99 percent confidence) that EPA missed the target was more acceptable.

A small allowable error (narrow confidence interval), such as ±1 percent (±0.01), is important for evaluating the expected low percentages of contaminant occurrence in systems because EPA wants to be able to determine when the monitoring results show that the percent of systems is distinguishable from zero or some other small value close to zero. Determining this outcome will help EPA decide which contaminants should receive primary focus for possible regulation after the results are evaluated with health effects data.

To further consider the implications of the table above, suppose that after sampling these 659 systems, the proportion *p* which equaled or exceeded a detection level was 4 percent (0.04). The estimate of the true (unknown) proportion will be 0.04±0.02, or 4 to 6 percent. This interval has a 99 percent likelihood of containing the true proportion of systems having an occurrence of the contaminant of concern. There is a 1 percent (0.01) chance (*a*) that the true proportion is outside this estimated interval. A larger allowable error, *d*, (e.g., 3 percent) results in a wider estimate window. Knowing only that the proportion is somewhere within a window of 6 percent (e.g., between 1 and 7 percent) was too large a window of error if the percent of systems having occurrence of the UCMR (1999) List contaminants is less than 3 percent, which may be possible based on information from previous unregulated contaminant monitoring. In such a situation, it will be difficult to determine whether the percent of systems with contaminant occurrence was significantly different than zero or some small number.

For the purposes of data interpretation in the future, EPA has determined that, rather than using the normal approximation to the binomial distribution, the Agency should use the Wilson score interval method (Newcombe, 1998) which results in a confidence interval around the estimate of the percent of systems with contaminant occurrence which is narrower on the left or "zero" side of the estimate and wider on the right side of the estimate. One advantage to this interval is that it does not include zero whenever the estimated exposure is non-zero.

Additionally, EPA will increase the representative sample size of CWSs to 721 to increase the statistical power of the smallest system category. EPA will also add 79 systems to the NTNCWS sample size (using the same approach of applying the percentage of population served by NTNCWSs in each State to derive the number of systems allocated to each State). A total of 800 CWSs and NTNCWSs are included as the national representative sample. This allocation facilitates assigning systems to each State in the representative sample, allowing each State to have at least two systems.

Technical peer review of the statistical approach found it to be sound for the purposes of estimating contaminant occurrence to assess population exposure to the contaminants from Assessment Monitoring. Both internal and external peer review indicated the possibility of using another statistical method (such as the Poisson approximation to the binomial distribution or Wilson score interval method) to derive the number of systems in the national representative sample and to interpret the data at a given confidence level and error once they are reported. Additionally, the public commenters supported the statistical approach for deriving and implementing the national representative sample of small systems.

The representative sample of 721 small CWSs and 79 NTNCWSs will be disaggregated to the State level, and stratified by water source type (ground water or surface water) and system size (the three size categories of 25–500, 501–3,300, and 3,301–10,000 persons). The stratification by State, water source type and system size is described in the following example.

Example. To determine the number of PWSs (CWSs and NTNCWSs) randomly selected for unregulated contaminant monitoring as part of the national representative sample, the following figures are used as the starting point and are approximations for the purposes of example only:

US population: 265,000,000

US population served by small PWSs serving ≤ 10,000 persons: 50,000,000

State A's population served by small PWSs serving 10,000 or fewer persons equals 1,251,340 persons, which divided by 50,000,000 persons served nationally by small water systems equals 2.5 percent, or the percent of State A's population served by small systems of the national population served by small systems. Multiplying 2.5 percent (0.025) times the 659 systems nationally equals 16.48, rounded to 16, which is the number of small systems allocated to State A for its representative sample. Mathematically, this can be expressed as:

$$\frac{1{,}251{,}340 \text{ persons in State A}}{50{,}000{,}000 \text{ persons in U.S.}} \times 659 \text{ systems in sample for U.S.} = 16 \text{ systems in State A's sample}$$

State A's population served by small PWSs supplied by surface water (SW) or ground water under the direct influence of surface water (GWUDI) equals 449,920 persons.

State A's population served by small PWSs supplied by ground water (GW) equals 801,420 persons.

For each water source type (surface or ground water), the population served by small systems is further divided into the size category. The next step is to divide the population in each size category by the population served by small systems in State A (1,251,340 persons), and then multiply that result by the number of small systems allocated to State A (18 systems), to obtain the number of systems in that size category for the water source type that will be in the State Plan (identified below as "State Plan Allocation"). For each water source type, the example results for State A are:

SW/GWUDI SYSTEMS IN STATE A

[Numbers of systems rounded to nearest whole number]

System size (persons served)	Population served by size category		Number of persons served in state A		Systems allocated to state A		State plan allocation
10,000–3,301	281,200 persons	÷	1,251,340	×	16	=	4
3,300–501	154,660 persons	÷	1,251,340	×	16	=	2
500–25	14,060 persons	÷	1,251,340	×	16	=	0
Total							6 systems

GW SYSTEMS IN STATE A

[Numbers of systems rounded to nearest whole number]

System size (persons served)	Population served by size category		Number of persons served in state A		Systems allocated to state A		State plan allocation
10,000–3,301	421,800 persons	÷	1,251,340	×	16	=	5
3,300–500	239,020 persons	÷	1,251,340	×	16	=	3
500–25	140,600 persons	÷	1,251,340	×	16	=	2
Total							10 systems

The total of 6 surface water and 10 ground water systems equals 16 systems, the number to State A's Plan. The replacement list of systems will also be developed and provided at this level of detail.

Sampling Plan. The sampling plan that EPA is considering is outlined here. As shown in the first matrix of confidence levels, the overall confidence level is established at 99 percent (0.99). The small water systems were allocated on the basis of population served, except in the very small strata, which EPA supplemented to bring the statistical inferential ability up to 95 percent in all cells of the confidence level matrix.

System Size Category	Desired Confidence Levels by Source Type		
	Ground Water	Surface Water	All Sources
Very Small (25–500 persons)	0.95	0.95	0.95
Small (501–3,300 persons)	0.95	0.95	0.95
Medium (3,300–10,000 persons)	0.95	0.95	0.95
All System Categories	0.95	0.95	0.99

SAMPLING PLAN

System Size Category	Planned national water system allocation by source type		
	Ground water	Surface water	All sources
Very Small (25–500 persons)	67	64	131
Small (501–3,300 persons)	186	74	260
Medium (3,300–10,000 persons)	189	141	330
All System Categories Subtotal	442	279	721
NTNCWS Subtotal			79
Total			800

Both the very small ground water and surface water systems categories contained too few systems to have a confidence level of 95 percent. The very small ground water category needed 6 additional systems and the very small surface water category needed 56 systems to bring them up to the 95 percent confidence level. These numbers of systems will be allocated to each State based on the number of persons served in each subcategory within the State. (Note that the example presented above did not reflect an additional allocation to the "very small" strata for surface or ground water systems for State A. Such an outcome would result because State A had a low number of people in this category relative to other States and would not be allocated an additional system in this plan.)

EPA has prepared a background document titled "National Representative Sample of Small Public Water Systems: Statistical Design and State Plans for the Unregulated Contaminant Monitoring Regulation" to describe in more detail this selection process and its relation to the State Plans. The background document is available by calling the EPA Safe Drinking Water Hotline at (800) 426-4791, or by viewing it on EPA's Internet Homepage for the Office of Ground Water and Drinking Water (www.epa.gov/safewater).

EPA asked for public comment on whether it should consider using a targeted approach for selecting systems in the national representative sample based on prior knowledge of contaminant use or occurrence, system operation or other locational information, rather than this stratified random selection approach. Internal and external peer reviewers and public commenters agreed that a targeted approach would bias the national results.

Several aspects of potential bias are of concern to EPA: (1) prior information on targeted use of a contaminant may not be perfect which may lead to missing the target zone; (2) targeting leads to biased results that would be expected to have a larger percentage of detections, potentially overstating occurrence of the contaminant; (3) targeting areas of known or expected contaminant use or occurrence for monitoring does not provide a representative national picture of occurrence, because both detections and nondetections of contaminants are equally important in determining national occurrence in the decision process of whether or not to regulate a contaminant; and (4) targeting areas of known or expected use or occurrence does not take into account that surface waters can carry the contaminant out of the targeted area.

The State Monitoring Plans will also include a representative sample of small systems that will be combined with a set of randomly selected large systems for Screening Survey monitoring of UCMR (1999) List 2 contaminants. The number of small systems, selected through the same statistical process from the systems used to conduct Assessment Monitoring, will be smaller (perhaps 150 to 200 systems out of a total number of about 300 small and large systems) because the purpose of the Screening Survey is to test for contaminant presence in systems rather than testing for concentrations in an established percentage (such as 2 or 3 percent) of systems, as is the case for Assessment Monitoring. If a contaminant occurs in a small percent (e.g., 0.5 percent) of systems, then the contaminant will be considered to occur at a level that will indicate that it should be included in the next round of Assessment Monitoring.

EPA needs to balance the number of systems included in the national representative sample required for statistical validity with the cost of paying for the testing. EPA believes that the final rule's approach balances the number of systems to be tested with the cost and also balances a nationally representative sample with the allowance for State plans. The final approach also relieves States from having to develop the statistical design and specify the systems to be monitored.

(b) Systems Selected for Pre-Screen Testing

If a State enters into an MOA with EPA, it can participate in the Pre-Screen Testing program. States must specify from 5 up to 25 systems as the systems most vulnerable to the contaminants on UCMR (1999) List 3. EPA will determine the number of systems to be selected in any State based on the population served by CWSs and NTNCWSs in a State. The States must modify their State Plans to identify the small systems selected for Pre-Screen Testing and notify the EPA of their addition to those Plans.

(c) Tribal Water Systems

Public water systems serving less than 10,000 persons that are located on Tribal lands in Indian country will be treated as an individual stratum for the representative sample. The stratified random selection process described previously allocates systems within water source and size category by population served. A PWS in Indian country will have the same probability of being selected as any other water system in another State based on the proportion of the population served by water source and system size category. Because no State has jurisdiction over such systems, EPA will consult with the appropriate tribal government concerning whether any initially selected system should be replaced due to merger, closure, or purchase of water from another system. The resulting set of systems will be the "State Plan" for Indian country.

Public comments relative to Tribal water systems requested that Tribal systems be specified through a stratified random selection process like the other systems in the national representative sample to avoid biasing the results. EPA agrees and plans to identify Tribal systems through the same stratified random selection process that is applied to the other systems.

(d) "Index" Systems

EPA generally has less information about systems serving 10,000 or fewer persons than about systems serving more than 10,000 persons. This lack of information on these systems and their operation affects EPA's ability to tailor regulations to systems of this size. To provide an improved understanding of small systems, EPA will select up to 30 small public water systems as "Index" systems and EPA will conduct Assessment Monitoring at these systems during each of the five years for which the UCMR List and national representative sample must be established. EPA is requiring more frequent monitoring from these systems than the systems selected for Assessment Monitoring. Index systems must be selected from the systems designated in State Monitoring Plans using a random number generator. EPA will pay for this monitoring, including provision of sample equipment, shipment of samples, testing, and reporting. EPA will help Index systems collect samples by sending a field technician to each Index system to obtain the samples. Index system sampling is being conducted to: ensure sample collection quality for the 30 systems; provide information of temporal variation encountered during the monitoring cycle; and better understand the needs of small public water systems in future regulations. The Index system sampling program is designed to ensure that future regulations better reflect the conditions under which small systems operate. 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. The monitoring results for the Index systems will be used to characterize the UCMR results to other small systems in the national representative sample with this frequency and for this additional information. EPA or its representative will also collect information on precipitation, land use and other environmental factors (e.g., soils and geology) to provide the Agency with information on other conditions potentially affecting drinking water quality of small systems. This Index system monitoring will facilitate extrapolation of Assessment Monitoring results nationally for systems of this size. A description of the selection process for Index systems using a random number generator will be presented in the background document, noted above, titled "National Representative Sample of Small Public Water Systems: Statistical Design and State Plans for the Unregulated Contaminant Monitoring Regulation."

Public comments received concerning Index systems were generally supportive of the approach to provide additional information to tailor future regulations to small systems.

(e) Other State Data

Some States may sample and test additional systems beyond those included in the State Monitoring Plan. Any additional systems sampled by States should not be combined with those of the State Monitoring Plan for the purpose of computing national estimates of contamination. While providing useful information for protecting the health of persons using drinking water from these systems, this additional data will bias the results of the national representative sample if included. However, if the State wants to report the results of such monitoring, EPA could receive the data through the Safe Drinking Water Information System (SDWIS) for input to the NCOD. EPA plans to develop acceptance criteria to allow such data to be placed in the NCOD. Public comments supported EPA's position that any data from additional systems not in the State Monitoring Plan should not be combined with data from the representative sample of small systems because it would bias the national results.

G. Reporting of Monitoring Results

Today's final regulation replaces the reporting requirements at 40 CFR 141.35 to make the reported occurrence results more useful for sound scientific analyses.

1. Reporting Requirements (Data Elements)

UCMR data are one of four types of data that will potentially be reported to the NCOD as required by Section 1445(g). The other types of data that may be included in the NCOD are: (1) regulated contaminant occurrence data below the maximum contaminant level (MCL) but above the minimum reporting level (MRL) (a regulation may be developed to obtain this data during 2000); (2) source water monitoring data; and (3) other data from special studies and research. Since these data will come from varying sources, they may have different reporting requirements. The PWS data from unregulated contaminant monitoring may have the smallest number of data elements to be reported because of the greater level of control over the quality of the data through the laboratory certification programs and the monitoring and quality control requirements in the final rule today.

EPA engaged in an extensive process of stakeholder and technical review when developing the NCOD to identify information reporting requirements that allow data from different sources to be adequately evaluated, compared, and interpreted. The NCOD information requirements process identified additional data elements that must be considered for UCMR reporting with unregulated contaminant sample test results. These data elements are especially important because many of the contaminants may not be routinely tested for and will need sample test data quality indicators to assist in interpreting the results. These additional data elements for the unregulated contaminants, and the reasons EPA adds them to the previous reporting requirements in this rule, are explained briefly in the following table. EPA requested public comment on these additional reporting requirements identified in Table 4, Final Additional Data Elements for the UCMR. The only comments EPA received, other than support for the additional data elements to be reported, were to clarify Minimum Reporting Level and Method Detection Level reporting and their difference from Instrument Detection Level and Estimated Detection Level and to use "presence/absence" for microbiological contaminants only. A technical peer reviewer also suggested that spiking concentration be added to the reporting requirements to allow evaluation of the methods being used, since the methods are still being refined. The reader is referred to the document titled, "Public Comment and Response Summary" for the Unregulated Contaminant Monitoring Regulation for a discussion of these comments. The complete list of data elements for the UCMR appears in the rule at § 141.35(d), Table 1.

TABLE 4.—FINAL ADDITIONAL DATA ELEMENTS FOR THE UCMR

Final data element	Definition	Reason for reporting
Public Water System Facility Identification Number—Source, Treatment Plant and Sampling Point.	An identification number established by the State, or, at the State's discretion, the PWS, that is unique to the system for an intake for each source of water, a treatment plant and a sampling point. Within each PWS, each intake, treatment plant and sampling point must receive a unique identification number, including, for intake; surface water intake, ground water well or wellfield centroid; and including, for sampling point; entry points to the distribution system, wellhead (or wellfield), intake, or locations within the distribution system. The same identification number must be used consistently throughout the history of unregulated contaminant monitoring to represent the facility.	Identify source water, treatment plant and sampling location for use in evaluating contaminant source controls in regulation development. The source intake/well identification number can be related to latitude and longitude for use in geographic analysis of land use, soils, geology and precipitation for alternative treatment and control analysis. Treatment plant identification number can be related to treatment information for that plant to use in analysis of alternative treatments. Sampling point identification number will allow the sample test result to be consistently associated with the same sample location over time for trend analysis.

TABLE 4.—FINAL ADDITIONAL DATA ELEMENTS FOR THE UCMR—Continued

Final data element	Definition	Reason for reporting
Sample Analysis Type	The type of sample collected. Permitted values include: (a) Field Sample—sample collected and submitted for analysis under this rule. (b) Batch Spike/Spike Duplicate Samples—Samples associated with a batch for calculating analytical precision and accuracy. A batch is a collection of 22 samples analyzed together, of which two are the spike and spike duplicate samples, that are tested for analyte concentrations.	Indicates field and spiked sample to ensure that the sample test result is used for the appropriate analysis (e.g., contaminant concentration trends, sample test performance, etc.).
Detection Level	"Detection level" refers to the detection limit applied to both the method and equipment. Detection limits are the lowest concentration of a target contaminant that a given method or piece of equipment can reliably ascertain and report as greater than zero (i.e., Instrument Detection Limit, Method Detection Limit, Estimated Detection Limit).	Indicates lowest quantifiable measurement level applied through the method to the sample to allow comparison with other sample test results.
Detection Level Unit of Measure	The unit of measure to express the concentration, count, or other value of a contaminant level for the detection level reported. (e.g., µg/L, colony forming units/mL (CFU/mL), etc.).	Indicates the reporting unit for the detection limit.
Batch Identification Number	A unique number assigned by the laboratory analyzing samples to a specific batch of samples. The number comprises 9 digits for the laboratory identification number, 4 digits for the year, 2 digits for the month, 2 digits for the day, and 2 digits for the batch of samples.	Allows calculation and comparison of precision and accuracy among batches of samples and association of precision and accuracy with each sample in a batch to sort results based on data quality.
Spiking Concentration	The concentration of method analytes added to a sample to be analyzed for calculating analytical precision and accuracy.	Allows calculation of precision and accuracy for a batch of samples and an evaluation of the method.
Analytical Precision	For purposes of the 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 RPD between spiked matrix duplicates using, RPD = $[(X_1 - X_2) / \{(X_1 + X_2)/2\}] \times 100$.	Indicates variability among laboratory results as measured by testing replicate field or duplicate spiked samples, and is a key measure of sample test performance.
Analytical Accuracy	For the purposes of the UCMR, 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.	Indicates whether test results are within a group of measurements corresponding to the true value of the results, and is a key measure of sample test performance.
Presence/Absence	*Chemicals:* Presence—a response was produced by the analysis (i.e., greater than or equal to the MDL but less than the MRL)/Absence—no response was produced by the analysis (i.e., less than the MDL). *Microbiologicals:* Presence—indicates a response was produced by the analysis/Absence—indicates no response was produced by the analysis.	Chemicals: Indicates results that do not have a quantifiable value and whether, for a positive result, the chemical concentration is between the MRL and the MDL to allow more thorough assessment of the method's capability to identify the contaminant. Microbiologicals: Allows measure under conditions and for microorganisms that are not able to be counted.

Note that EPA deleted "composite" from the proposed set of data elements since the final rule does not allow compositing. Since this program is designed to measure actual occurrence of contaminants, compositing (the combining of samples from several sampling points of a water system) will dilute concentrations of contaminants to be measured. Stakeholders supported the deletion of compositing, and believed it to be contrary to the objectives of the UCMR. No public comments were received on this subject.

Also note that "Public Water System Facility Source Intake Identification Number" must currently be reported under existing reporting requirements for SDWIS under 40 CFR 142.15(b)(1). The UCMR will expand this requirement to include the unique identification numbers for treatment plant and sampling point, which may not change over time. EPA is not requiring, through today's action, the reporting of treatment data (treatment objectives and processes) since these data are already required to be reported by January 1, 2000, for all systems. (Safe Drinking Water Information System

FACT SHEET, Revised Inventory Reporting Requirements, June 1998)

The rationale for including these data elements is that EPA needs the detailed information concerning the sample test, location, and treatment that will allow the results to be used in making a determination of whether or not to regulate the contaminant and to develop regulations. The specific reasons are identified in Table 4. To avoid duplicate and costly resampling efforts, EPA believes that systems should obtain and report the most complete information the first time a sample is tested.

The information requirements process for development of the NCOD identified technical questions that need to be answered in the regulatory process that the UCMR is to support. These data elements are associated with these questions. While the list of data elements will increase by five (from 12 to 17) in today's final UCMR (as compared to the existing UCMR), reporting them the first time precludes the need to obtain the information through another process. Because the 1996 SDWA Amendments expanded the determinations and types of analyses that need to be conducted to develop a rule, including these data elements is responsive to the new regulatory environment in which drinking water regulations must be developed.

These new data elements will not be a major burden for a PWS. Only four of the elements must be supplied by the PWS: the PWS ID; the Facility ID; the sample number; and sample collection date. All other elements can be supplied by the laboratory.

States commented that EPA should not require system inventory data if those data are required under another reporting arrangement in 40 CFR 142.15(b)(1). As a result, EPA modified this final rule eliminating inventory data elements that are required for other reporting. Today's rule requires that Public Water System Facility ID be reported. Coupled with the PWS ID, the facility ID can be linked to sampling site information and locational data necessary for thorough analyses of the data.

As explained earlier, EPA also requires owners/operators of Index systems that are part of State Plans for the national representative sample to provide data concerning well casing, screen depths and pumping rates at each well or intake at the time of monitoring. This reporting will allow EPA to tailor regulations to systems serving 10,000 or fewer persons by relating sample test results to conditions that affect capture of contaminants by ground water and surface water supplied systems.

2. Reporting to the Primacy Agency

Today's rule changes reporting relationships for unregulated contaminant monitoring data. The statute requires that the results be reported to the primary enforcement (or "primacy") authority for the system. Many States and systems raised questions about the necessity and utility of requiring State primacy for the UCMR. In response to these comments, EPA has decided to directly implement the UCMR, while allowing States to participate in State Plan review and implementation through MOAs rather than through State primacy. Some States noted that UCMR data will primarily be used by EPA to make regulatory determinations, and that such data are not required by the State to assess compliance for public health. The States however, need these data for their program records and implementation. In response to these comments, EPA is not requiring the State to report the data, but is requiring the PWS to report the data electronically to EPA, unless otherwise arranged, with a copy to the State. EPA will issue guidance on the process of reporting to EPA electronically or in other formats and providing a copy of the results to the State. Since EPA is paying for small systems' testing and reporting, the Agency will set up an electronic reporting system for these systems that are required to report. EPA will report the data to the States for these small systems. EPA will hold the data of small and large systems for 60 days to allow systems and States to review the data before placing the data in the NCOD, as required by SDWA. EPA encourages States to review the data as time allows because their review is critical to identifying drinking water quality issues that may not be obvious at the national level. This review provides an additional level of data quality control before EPA uses the data in regulatory decisions.

3. Timing of Reporting

In response to public comments from States and systems requesting more time to report these data, EPA modified the rule at § 141.35(c) to require large PWSs to report their monitoring results within thirty days, rather than ten days, after the month in which they receive the results from the laboratory. This requirement provides additional time for systems to review the UCMR results before reporting them to EPA.

4. Method of Reporting

SDWA Section 1445 (a)(2)(D) states that each PWS that monitors for unregulated contaminants must provide the monitoring results to the primacy authority for the system. Today's final rule requires electronic reporting by PWSs to EPA, while providing a copy of the results to the State (§ 141.35(e)). The rule also allows EPA to specify another method for reporting by a PWS, if necessary. Public commenters supported allowing an alternate reporting method for PWSs if they could not report electronically. Note that EPA will pay for the testing and laboratory analysis of samples for small systems in State Monitoring Plans. Since EPA plans to establish electronic recordkeeping of the results from systems in State Plans, electronic reporting for these systems will be done through the assistance of EPA. EPA might consider specifying another method for reporting when a system serving over 10,000 persons has not developed the capability to report electronic results. However, most laboratories have this capability and could probably provide this service for the PWS.

5. Public Notification of Availability of Results

SDWA Section 1445 (a)(2)(E) requires notification of the results of the UCMR program to be made available to persons served by the system. The results of UCMR monitoring for CWSs will be reported through annual Consumer Confidence Reports (CCR), as required by § 141.153 (d). For NTNCWSs, UCMR monitoring results will be reported according to requirements of the revised public notification rule as proposed May 13, 1999 at 64 FR 25963. Failure to monitor for unregulated contaminants required through the UCMR will also be reportable under the public notification rule.

The results that will be reported through the CCR and public notification rules should be based on the same monitoring data that the States will receive under the UCMR and will be required to be reported to the NCOD. Information in the NCOD will be available to the public.

VII. Section-by-Section Analysis of Public Comment and EPA Response

This portion of the preamble is devoted to highlighting major changes in the specific sections and paragraphs of the revisions to the Unregulated Contaminant Monitoring Regulation, including 40 CFR 141.35, 141.40, 142.15(c), and 142.16, in the order that they appear in the Code of Federal

Regulations and are promulgated here as a final rule today. The details of the peer review and public comments and EPA's responses can be found in two background documents: External Peer Reviews of the Unregulated Contaminant Monitoring Regulation, and Public Comment and Response Summary for the Unregulated Contaminant Monitoring Regulation.

A. Section 141.35—Reporting of Unregulated Contaminant Monitoring Results

1. Does this reporting apply to me?

This paragraph notes that § 141.35 applies to the owner or operator of any PWS required to monitor for unregulated contaminants under § 141.40. Exceptions to the reporting requirements are also noted. The majority of comments received on this topic suggested that water systems using purchased water should be required to monitor for contaminants occurring in distribution lines, such as microbiological contaminants. Like the proposed rule, today's final rule states that small systems serving 10,000 or fewer persons need not report their results to EPA because EPA will pay and arrange for testing and reporting of the results. To improve the logical flow of the rule, EPA moved this exception to this paragraph from the paragraph immediately below it.

In response to these comments, EPA has modified this section, noting that water systems that purchase all of their water will be included in the UCMR for contaminants having distribution system sampling points, including points of maximum residence time or points of lowest disinfectant residual.

A few commenters suggested it was inappropriate for only the small systems selected as part of the national representative sample to report UCMR results and not other small systems. In response, EPA notes that Section 1445(a)(2)(D) of the SDWA states that all systems required to conduct unregulated contaminant monitoring must report the results. Because only a nationally representative sample of small systems will be required to monitor under the UCMR, only those systems will have to report the results.

2. To whom must I report?

This section explains the reporting requirements for systems that will monitor for unregulated contaminants.

Under today's rule, a system must report the results of unregulated contaminant monitoring to EPA and provide a copy to the State. This is a change from the proposal and is based on EPA's decision, in response to public comment, to implement this rule through MOAs with State agencies rather than through the primacy process. EPA will hold the data for 60 days to allow systems and States time to conduct a quality control review before entering the data into the NCOD. This is discussed in more detail in IX.A. Implementation of the Rule. The system also must notify the public of the monitoring results as provided in Subpart O (Consumer Confidence Reports) and proposed Subpart Q (Public Notification) of this part.

Even though small systems do not report their results because EPA will do that for them, small systems must still comply with the public notification requirements for these results.

3. When do I report monitoring results?

This section specifies that a PWS must report the results of unregulated contaminant monitoring within thirty days following the month in which they receive the results from the laboratory.

Today's final rule is slightly different from that of the proposed rule. Rather than reporting within 10 days of receiving monitoring results, it extends the deadline for reporting results to thirty days after the month in which the results are received from the laboratory. This change provides more time for the system to review the data before reporting. This is in response to comments received indicating that the requirement that systems report results within 10 days after receiving results from the laboratory is too short a period. Additionally, commenters were concerned with adequate time to review and understand the data before reporting them to EPA. Also, as noted previously, EPA will wait 60 days before placing the data in the National Drinking Water Contaminant Occurrence Database (NCOD) to allow additional time for systems, States and EPA to ensure quality control of the data.

Consistent with the decision to not require States to adopt this rule as part of primacy, EPA has also clarified that EPA, not the State primacy agency, will specify the required monitoring period.

A commenter was concerned with the costs associated with reporting UCMR results quarterly and requested that PWSs be allowed to report data in an annual batch. EPA is maintaining the requirement of quarterly reporting because EPA does not believe that annual reporting would allow EPA to use the data as input to the next round of the CCL and UCMR lists, which is a principal objective of the rule. Also, large PWSs already report quarterly. Additionally, EPA plans to evaluate the data early to determine whether modifications are needed in the analytical methods.

4. What information must I report?

This section lists and defines the data elements that must be reported. In addition to analytical results and quality control, EPA is requiring information on the PWS from which the analyzed sample was taken.

Today's rule modifies somewhat the unregulated contaminant monitoring reporting requirements in the proposed rule (Table 8 of "Revisions to the Unregulated Contaminant Monitoring Regulation for Public Water Systems," **Federal Register**, vol. 64, no. 83, April 30, 1999, pages 23426 to 23428) and reorders the sample data elements. For example, for microbiological monitoring, future requirements may specify either a sampling point in the distribution system that has the maximum residence time or, under today's rule, the lowest disinfectant residual, in response to comments concerning systems using disinfectant booster stations where the disinfectant residual is low. These sampling point types were added to the data element listing. Questions were raised as to how the UCMR would accommodate water systems that have mixed sources (i.e., use blended/mixed surface water and ground water). In response, the data element, Water Source Type, will be modified in the Safe Drinking Water Information System (SDWIS) Inventory Reporting Requirements to address this issue: the valid choices for this data element will include purchased/non-purchased blended/mixed water. See 40 CFR 141.35(d) Table 1 of the rule for more information.

Sample collection date must be reported as 4-digit year, 2-digit month, and 2-digit day under the final rule to ensure year 2000 compliance, and to refine date records, as suggested by peer reviewers. Also added to the sample data elements is a sample batch identification number, which is assigned by the laboratory to each batch of samples analyzed with the spike and spike duplicate sample at the spiking concentration to allow analysis of method performance. The list of permitted sample analysis types is reduced to field sample and batch spike/spike duplicate since these will be the only required sample types reported for unregulated contaminant monitoring.

During the public comment period, a comment was received suggesting that inventory data elements should be provided officially by the States through

the inventory data reporting process, rather than by systems with their sample results. EPA agrees that inventory data elements are already reported by a different mechanism. Therefore, EPA has removed the data elements that are or will be included in the Safe Drinking Water Information System (SDWIS) Inventory Reporting Requirements: sampling point type, water source type, public water system facility type, latitude of the public water system facility for source and treatment plant, and longitude of the public water system facility for source and treatment plant. This change in data elements under today's rule provides for the revision or addition in inventory data reporting for the data elements not included in the rule to address:

(A) for sampling point type, an expansion of allowable choices to include: raw/untreated water, finished water from treatment system, finished/treated water from entry point to the distribution system after treatment, finished/treated water from within the distribution system, finished/treated water from the distribution system at the location of maximum residence time or lowest disinfectant residual, finished/treated water from the distribution system at the location of lowest disinfectant residual, finished/treated water from household/drinking water tap, finished/treated water from unknown location, and other finished/treated water;

(B) for water source type, to include allowable choices of: surface water from a stream or purchased surface water from a stream, surface water from a lake or reservoir, or purchased surface water from a lake or reservoir, ground water under the direct influence of surface water or purchased ground water under the direct influence of surface water, ground water or purchased ground water, and blended/mixed surface water and ground water, or purchased blended/mixed surface water and ground water;

(C) for public water system facility type, to include, for the purposes of UCMR, the allowable choices of: intake (for surface water sources), well or wellfield (for ground water sources), treatment plant, sampling point, entry point to distribution system, reservoir, booster station, and unknown;

(D) latitude of the public water system facility for source and treatment plant; and

(E) longitude of the public water system facility for source and treatment plant. Additionally, the SDWIS inventory reporting requirements will address associating the PWS facility identification number of any sampling point with the PWS facility identification number of its respective treatment plant. Furthermore, the reason that the latitude and longitude of the treatment plant should be reported is to allow the association of other data, such as health effects information, with a point closest to the affected population, since the ultimate use of the UCMR data is for input to exposure assessment in determining whether or not to regulate a contaminant.

Comments were received suggesting that EPA include the maximum reporting level (MRL) in the data elements. It is not necessary to include the MRL in the data elements because the MRL is specified in the rule in § 141.40(a)(3) Table 1. The rule wording is clarified so that a particular laboratory having the capability for reliable lower detection may report concentrations below the MRL.

Some commenters had concerns about the inclusion of a presence/absence data element. For microbiological contaminants, this data element may be needed because analytical methods do not always allow for quantification of the target organism in the sample and may only allow for a qualitative response, i.e., presence or absence. For chemical contaminants it can be used for reporting the detection of chemical contaminants below the MRL but above the MDL.

5. How must I report this information?

This section explains that the unregulated contaminant monitoring results must be reported in electronic or in another format specified by EPA, such as a template on paper that can be scanned and entered into the NCOD electronically.

A question was raised as to how EPA will be able to accept electronic data from diverse laboratory information systems at the many laboratories that may be reporting data. It was also suggested that EPA work with States and water suppliers to develop formats to make electronic submission easier. EPA is considering the development of software that may be downloaded from the EPA website to enable systems and their laboratories to electronically report data. This may be the same electronic data form that allows PWSs to report data to NCOD/SDWIS.

Some commenters indicated that the State should have the option to specify an alternate reporting method, particularly with respect to small systems. It was also suggested that EPA should write the rule so as not to preclude reporting directly to States and EPA from the laboratories for small systems, as well as for large systems. The laboratory, whether EPA-approved or an EPA-designated (i.e., contract) laboratory, could report to systems, States, and EPA. As noted previously, EPA will report the data for small systems.

As noted, the final rule is modified to require systems to report to EPA. EPA will require electronic reporting, unless some other format must be used for a particular system. This situation may be established in consultation with the State and described in subsequent guidance that EPA will prepare on the UCMR reporting process.

One commenter also expressed the need for an electronic legal equivalency of a signed hard copy of a laboratory report. Since there is no requirement for electronic reporting of a signed laboratory report, EPA will not require an electronic legal equivalency. Systems may want a signed hard copy for their own records.

6. Can the laboratory to which I send samples report the results for me?

This section states that a laboratory can report the sample results, so long as it provides the system with a copy for review and record keeping.

The Agency was asked to clarify that it is the responsibility of the PWS owner/operator to report data to EPA, even if the laboratory reports the results. In response to comments, the rule wording has been clarified to stress that the PWS is responsible for reporting information and ensuring that the laboratory provides the results to EPA and the State.

7. Can I report previously collected data to meet the testing and reporting requirements for the contaminants in § 141.40(a)(3)?

This paragraph was added in response to many comments received requesting a provision for systems to report relevant unregulated contaminant data collected before implementation of today's rule, in lieu of allowing only UCMR data collected after the rule's effective date. The general consensus was that some large systems may already have monitored for or want to monitor before 2001 for these contaminants, especially if it fits within their monitoring cycle. This paragraph specifies that, as long as systems meet the requirements specified in § 141.40(a)(3), (4), (5) and Appendix A for monitoring and in § 141.35 (d) for reporting, the data collected before the effective date of this rule can be submitted to meet the testing and reporting requirements for the contaminants in § 141.40(a)(3).

B. Section 141.40—Monitoring Requirements for Unregulated Contaminants

1. Requirements for Owners and Operators of Public Water Systems

(a) Do I have to monitor for unregulated contaminants?

This section eliminates unregulated contaminant monitoring requirements for owners and operators of transient, non-community water systems. It also specifies the monitoring requirements for large systems that do and do not purchase their entire water supply from another system and for small systems selected for the program that do and do not purchase their entire water supply from other systems.

Today's rule describes specific monitoring requirements for large and small systems that purchase their entire water supply from other systems. This is in response to the many commenters who indicated that PWSs using purchased water should be included in the UCMR for microbiological contaminants, or other contaminants that may arise in the distribution system. As a result, EPA modified the rule to require that water systems that purchase all of their water will be included in the UCMR for contaminants having distribution system sampling points.

(b) How would I be selected for the monitoring under the State Monitoring Plan, the screening survey, or the pre-screen testing?

This section is basically unchanged from the proposed rule since commenters broadly supported the 3-tier approach to the monitoring program. It explains that only a representative sample of small systems, randomly selected by EPA, will be required to conduct assessment monitoring for unregulated contaminants as part of a State Monitoring Plan. A subset of these systems will be randomly selected as Index systems and required to submit additional information. Each State will have the opportunity to modify the list of selected systems.

(c) For which contaminants must I monitor?

The Unregulated Contaminant Monitoring List is presented in this section. It comprises List 1, the chemical contaminants to be monitored under Assessment Monitoring; List 2, the chemical and microbiological contaminants to be monitored under the Screening Survey; and List 3, the chemical and microbiological contaminants to be monitored under Pre-Screen Testing.

In response to many comments, today's rule makes changes in the contaminant lists as presented in the proposed rule. For List 1, the chemicals perchlorate and acetochlor are added and the microbiological contaminant *Aeromonas* is removed and moved to List 2. The analytical methods for perchlorate and acetochlor are reserved. The methods are expected to be ready in the near future, at which time, a rule revision will be published for comment and promulgated to ensure these contaminants can be monitored on or before January 2001. Nitrobenzene, also on List 1, has an approved method, but it requires careful implementation. Acetochlor (now on List 1) is removed from List 2, and RDX and the radionuclide polonium-210 are added to List 2. The sampling locations for List 1 and 2 contaminants are Entry Points to the Distribution System (EPTDS), except for *Aeromonas* and polonium-210, for which the sampling points are reserved until the methods are further validated and promulgated. The radionuclide lead-210 is added to List 3. Sampling locations for the radionuclides and microogranisms are reserved, as are the dates for the period during which monitoring must be completed. These dates will be determined at a later time. To activate monitoring for the contaminants on Lists 2 and 3, the methods and related sampling requirements must be specified in future rulemaking revising this regulation.

Many commenters indicated that it would be premature to include *Aeromonas* on List 1 since the specified method has not been sufficiently field tested. It was also suggested that the rule should be clear about its focus on *Aeromonas* the genus, not the species *A. hydrophila*.

In response, EPA has moved Aeromonas to List 2. The CCL specifies *Aeromonas hydrophila*; however, the proposed analytical method identifies to the level of the *Aeromonas hydrophila* complex, which is a group of about 7 to 12 *Aeromonas* species. To identify to the species level would increase the cost and complexity of the analysis and, given funding considerations, would limit the size of the *Aeromonas* monitoring program that could be done. Given the cost of the analyses and how frequently *Aeromonas* has been found in previous finished water surveys, a panel of EPA scientists (CCL Microbiology Meeting, Cincinnati, OH, July 9, 1998) agreed that identifying to the *Aeromonas hydrophila* complex (rather than the species) level was adequate for the purpose of the UCMR. A final method has not yet been written for *Aeromonas*. The current draft analytical method for *Aeromonas*, draft EPA Method 1602, does not include verification tests since a final decision on the inclusion of verification tests into the method will be made after method validation studies. Since the method validation studies have not been completed, EPA has placed *Aeromonas* on List 2, to be monitored after the method is ready.

In response to over 100 public comments and peer review considerations addressing the inclusion of perchlorate in the UCMR, EPA has added it to List 1. EPA did not originally propose monitoring for perchlorate under this portion of the regulation based on three general concerns: its apparent local/regional, rather than nationwide, occurrence at the time EPA assembled the monitoring list; current analytical methods do not adequately address potential interferences from chloride, sulfate or other dissolved solids; and no laboratories are certified for performing analyses using the methods for perchlorate. Based on many comments that showed perchlorate occurrence in many locations around the nation, EPA placed perchlorate on List 1. The analytical method for perchlorate is listed as "reserved" in the UCMR pending imminent conclusion of EPA refinement and review of the analytical method. Since EPA did not initially include a perchlorate analytical method in the proposal to this regulation, it will be necessary for EPA to issue an additional regulation to formally propose and promulgate a perchlorate analytical method prior to initiating monitoring for perchlorate under the UCMR.

Therefore, following promulgation of the UCMR (including the "reserved" perchlorate method reference), EPA will be proposing a new regulation specifying both the approved analytical method for the analyses of perchlorate, and the implementation of a laboratory approval system, where labs are certified to test for perchlorate. EPA is currently conducting analytical methods development to support the analyses of perchlorate. This new method will be based on the currently available ion chromatography methods, but will include a criteria detailing when a laboratory must perform a sample clean-up procedure to minimize the impact of elevated concentrations of chloride, sulfate or other dissolved solids. The laboratory approval system will be based upon previous certification of the laboratory for the analyses of compliance monitoring samples using

either EPA Method 300.0 or 300.1, and the successful analyses of a perchlorate performance evaluation sample.

EPA asked for comment on and a few commenters recommended the addition of RDX (hexahydro-1,3,5-trinitro-1,3,5-triazine) to the UCMR. In response, EPA has placed RDX on List 2, as its method needs further refinement. EPA will propose and promulgate an analytical method for RDX prior to requiring monitoring for RDX under the UCMR.

EPA also received comments suggesting that it move acetochlor, 2,4-dichlorophenol and 2,4,6-trichlorophenol from List 2 to List 1, and require systems to use EPA Method 525.2 to analyze for acetochlor and either a new SPE/GC/MS method modified for EPA Method 525.2 or a modified EPA Method 552 to analyze for the phenols. EPA has moved acetochlor to List 1, since the analysis of acetochlor using EPA Method 525.2 is expected to be approved prior to UCMR implementation. The evaluation of the use of EPA Method 525.2 will be finalized after acetochlor preservation studies have been completed. EPA will propose and promulgate an analytical method, likely EPA Method 525.2, for acetochlor prior to requiring monitoring for acetochlor under the UCMR.

EPA did not move 2,4-dichlorophenol and 2,4,6-trichlorophenol to List 1 since the progress of method development for these contaminants is not equivalent to that of acetochlor. EPA has determined that the phenols are not compatible with EPA Method 525.2 and expects to require a separate SPE/GC/MS method currently under development. A modification to EPA Method 552 was also suggested. The suggested diazomethane modification to EPA Method 552 is not an option permitted in Method 552 as an EPA approved method and must be evaluated, reviewed and approved before allowing it to be used as an EPA method.

As noted in this comment, dichlorophenol and 2,4,6-trichlorophenol can only be analyzed using method 552, when the diazomethane used is sufficiently strong. This does not lead to the type of reproducibility needed to approve this method in a variety of analytical laboratories that may produce diazomethane of varying strengths. If the diazomethane is not as strong as that indicated in this comment, the recovery of dichlorophenol can drop to 10%. In addition, 2,4,6-trichlorophenol is subject to interferences caused by the derivatization product of 2,4-dichlorophenol, regardless of the strength of the diazomethane. Method 552 is not approved for the analyses of any other UCMR analytes. Therefore, use of Method 552 for these 2 compounds would then require the laboratory to use a separate method for the analyses of the other phenols included in the UCMR. Instead of requiring 2 methods for these analyses, EPA is currently conducting the method development necessary to provide a solid phase extraction GC/MS method, that does not require derivatization, for the analyses of all of the phenols included in the UCMR as well as other phenols not currently listed. This will provide a single solid phase extraction, GC/MS method for the analyses of all of the phenols included in the UCMR. Therefore, 2,4-dichlorophenol and 2,4,6-trichlorophenol will remain on List 2.

As suggested by several commenters, EPA has added polonium-210 and lead-210 to the UCMR Lists. New information indicates that methods for these contaminants may be easier to conduct than originally envisioned. However, EPA research and an external expert reviewer with experience with radionuclides note that the currently available methods for lead-210 and polonium-210 may be very time consuming and will require an experienced analyst. There are also significant laboratory capacity and capability concerns. Few, if any, laboratories currently performing compliance drinking water radiochemistry have any experience with polonium-210 or particularly lead-210. The method for lead-210, in particular, needs further refinement. Therefore, EPA has added polonium-210 to List 2 and lead-210 to List 3. Before requiring monitoring for these contaminants, EPA will need to address issues related to radionuclide laboratory capacity and certification.

The recommendation was also made that the Agency add EPA Method 502.2 for the measurement of MTBE. Several public comments suggested that EPA Method 502.2 was reliable, and that if it is not added, then there could be added burden on PWSs using GC methods. EPA considered the commenters concerns; however, the Agency is not allowing the use of EPA Method 502.2 for MTBE. MTBE is not included in EPA Method 502.2 because MTBE cannot be reliably measured by either of the detectors used in the method, and its stability has not been tested using the preservatives listed in that method.

Some commenters also suggested the use of EPA 525.2 for nitrobenzene since they have problems using the methods listed in this regulation. Nitrobenzene will remain on List 1 with EPA Method 524.2, and voluntary consensus standard methods D5790-95 and SM6210D being approved for its analysis. However, the commenters are correct that some laboratories have had problems measuring nitrobenzene using these methods. When laboratories do not use the three stage trap listed in the method, nitrobenzene cannot be detected at reasonable concentrations in either standards or samples. Since they will therefore clearly fail the quality control requirements of the method, data will only be generated by laboratories that can provide useful data based on full method implementation. While the data provided by a commenter and confirmed by current EPA methods development research demonstrate that nitrobenzene can be analyzed using EPA Method 525.2, the preservation of nitrobenzene using Method 525.2 conditions has not been demonstrated. The methods development research needed to determine that nitrobenzene can be preserved using the sampling procedures specified in EPA Method 525.2 is currently being conducted. If nitrobenzene is compatible with this method's preservation requirements, then EPA will propose and promulgate an analytical method for nitrobenzene prior to requiring monitoring for nitrobenzene.

As for the use of EPA Method 525.2 for the analyses of nitrobenzene, research recently conducted in the OGWDW laboratory clearly indicated that nitrobenzene cannot be accurately analyzed using Method 525.2. Recoveries of nitrobenzene were less then 10% when samples were extracted using the conditions specified in method 525.2. In conversations with the laboratory submitting this comment, EPA was informed that the data submitted in this comment was not developed using the procedures specified in EPA Method 525.2. In addition, no analyte stability data is available for the storage of nitrobenzene in samples preserved as specified in method 525.2 or in extracts generated using method 525.2. Therefore, EPA Method 525.2 will not be approved for the analyses of nitrobenzene.

One commenter suggested that EPA Method 632 is a simple method with adequate sensitivity for measuring diuron and linuron. EPA Method 632 is a modification of the National Pesticide Survey Method 4, which EPA has found is not reliable for diuron and linuron.

One commenter requested that an HPLC method that can measure each of the two DCPA acid degradates separately be approved for their analyses. However, this method was published in a journal not by EPA or

any of the consensus methods organizations. This method, to the best of EPA's knowledge, is only being used in a limited number of laboratories and therefore has not had the level of validation necessary for use in this type of occurrence data gathering effort. In addition, since the methods that were approved measure the two DCPA degradates as a single analyte, approving a method that measures them differently would cause concern about data reporting and interpretation.

(d) What general monitoring requirements must I follow for List 1 monitoring?

This section specifies what is generally required of all systems participating in Assessment Monitoring. It also details additional monitoring requirements unique to large and to small systems.

Several commenters expressed support for collecting routine water quality parameters (WQPs) and agreed that WQPs provide useful information and a solid framework within which to explain and understand monitoring results, especially for microbiological contaminants. Several did not believe that reporting or testing of WQPs is necessary, noting that WQPs are not routinely collected for all systems, and expressing particular concern that small ground water systems without treatment do not collect information on chlorine residuals.

Water quality parameters are important for microbiological contaminants and may affect degradation of chemical contaminants. However, EPA is limiting the set of additional parameters, in response to comments. EPA is requiring reporting of additional parameters, as appropriate to the contaminant type, including pH, turbidity, temperature, and free and total disinfectant residuals. In addition, today's rule specifies the contaminant type and EPA Method, Standard Method, or other voluntary consensus standard that may be used to measure these parameters. Small ground water systems that do not disinfect would have no residuals to measure or report, so this will not be a burden. Furthermore, for small systems serving 10,000 or fewer persons, EPA will pay for the testing of these water quality parameters as part of the testing program for unregulated contaminants.

The monitoring requirements for large systems remain unchanged from the proposed rule. Text covering small systems has been clarified (1) to indicate that the State may inform small systems of sampling arrangements other than those listed in this section, (2) that EPA-designated laboratories will provide sampling equipment, and (3) the EPA will specify sample collection times.

It was suggested that the Agency use total trihalomethane (TTHM) monitoring sites for the microbiological contaminants. In general, commenters requested that more explicit designations be given for microbiological sampling sites. EPA has noted that it expects that system specific sites of normal and maximum residence time and normal and lowest chlorine residual will be designated when revisions to this final rule are made for contaminants of concern in distribution systems. These sites have been designated for other rules, related to total coliform and total trihalomethane/disinfectant byproduct sampling. Further, EPA will propose and promulgate appropriate monitoring sites for microbiological contaminants prior to requiring monitoring for *Aeromonas* and other contaminants of interest in distribution systems. The TTHM monitoring sites may be appropriate and, if so, will be included in the future rulemaking.

(e) What specific sampling and quality control requirements must I follow for monitoring of List 1 contaminants?

This section details the requirements for all systems, including sample collection, shipping time and reviewing and reporting results. It also prohibits compositing samples. Also provided in this section are requirements unique to large and small PWSs that are part of the State Monitoring Plan.

Today's text has been clarified to indicate that the State or EPA may inform all systems of sampling arrangements other than those specified in the rule. Other changes from the proposed rule related to large systems include clarifications on the frequency of sampling for chemical and microbiological contaminants conducted by surface water and ground water systems, as well as expanded information on sampling locations.

Regarding small systems that are part of a State Monitoring Plan, today's rule notes that the State or EPA may inform the system of sampling arrangements other than those specified in the proposed rule. It also notes that EPA's laboratory will send additional instructions for sampling if the first sampling event was not properly conducted.

(i) All systems

Overall requirements for all systems relative to (A) sample collection and shipping time, (B) no compositing of samples, and (C) review and reporting of results were not changed from the proposed to final rule.

(ii) Large systems

Specific sampling requirements for large systems are in this section.

(A) Timeframe

One commenter indicated that EPA should adapt the UCMR process to the 3-year compliance monitoring cycle. The rule already states that coordination with the 3-year compliance monitoring cycle is appropriate.

(B) Frequency

Many commenters were concerned that requiring ground water samples 6 months apart was not flexible enough to accommodate other monitoring schedules. Several commenters also suggested that systems using groundwater only be required to collect one sample per year because ground water systems do not vary much in water quality.

EPA has modified the rule to provide flexibility to the system to pick one of the three months in the vulnerable time and then one of three months 5 to 7 months earlier or later than the vulnerable time. This schedule should preserve the longer time between ground water samples desired for calculating an average annual concentration for exposure assessment.

EPA will maintain the two samples for ground water systems. Ground water systems encompass a wide range of conditions and many utilize unconfined settings that do exhibit temporal variability. To assess exposure from a one-year sampling activity, most experts EPA consulted and most stakeholders agreed that the program must try to capture the range of contaminant concentrations that occur to ensure representativeness of the results over time nationally. Two samples are the minimum to estimate an average exposure; one sample will be targeted toward the season of elevated concentrations (the vulnerable monitoring time). Many experts and reviewers suggested more frequent sampling, but the current design was deemed a reasonable compromise between data needs and burden. The UCMR frequency adds one additional sample over five years for a ground water site, not one every year. While some systems may not exhibit much variability, and some deep systems may not exhibit any synthetic contaminants, the UCMR must include the full range of water system conditions to develop an accurate estimate of national occurrence and exposure. Additionally, with the UCMR monitoring being

coordinated with compliance monitoring (to the extent possible), approximately one-third of systems affected by the rule will monitor each year. Therefore, UCMR Assessment Monitoring is expected to be conducted over a range of hydrologic patterns.

This wide range of ground water conditions also effects the nature of vulnerable periods. Some ground water systems show clear seasonal patterns, some show different scale of variability, and some show no variations (for some types of contaminants). For these new contaminants, EPA set a default vulnerable period (May, June, or July) that would fit the majority of vulnerable seasonal patterns around the United States. Expert technical reviewers and stakeholders concurred with this period. However, the State can specify a different period, based on their knowledge of local conditions. EPA decided not to allow systems to establish vulnerable periods because of the need for national consistency to support a sound statistical approach. Allowing each system to establish a vulnerable time would introduce significant variability in the program implementation, contrary to the consistency basis of the statistical approach for an unbiased sample. EPA decided that flexibility at the State level to select an alternate vulnerable monitoring time was the maximum allowable variability that should be incorporated into the implementation of the program.

(C) Location

A few commenters suggested that EPA allow source water monitoring, particularly in States where source water monitoring is used as a more stringent location for compliance monitoring. In related comments, the Agency was asked to provide further information about entry points to the distribution system (EPTDS), particularly with respect to groundwater systems with multiple wellhead and/or using multiple aquifers, suggesting that representative samples might be collected instead of from every entry point.

The sampling location for chemical contaminants is given on List 1 as the EPTDS and is now further defined to include the compliance monitoring point specified by the State or EPA under 40 CFR Part 141. In implementing compliance monitoring, the States and EPA have made determinations of where representative samples are collected, and this rule will incorporate these determinations and be consistent with ongoing monitoring. However, if the compliance monitoring point specified by the State is a source (raw) water site, and a UCMR contaminant is detected, then sampling must be conducted at the EPTDS unless the State or EPA determines that no treatment or processing was in place that would affect the measurement of the contaminants. In that case, the additional sampling at the EPTDS would not be required.

(D) Sampling instructions

This section did not change and EPA did not receive any comments on it.

(E) Testing and analytical methods

Several commenters raised questions about the process for laboratory certification under the rule. As noted in the rule, laboratories are automatically certified for the analysis of UCMR chemicals if they are already certified to conduct compliance monitoring for a chemical included in the same method being approved for UCMR analysis. Since the Standard Methods, ASTM, and AOAC methods approved in the UCMR use the same technology as the EPA method listed for the same analyte, laboratories certified for compliance monitoring using the EPA method may also use any of these methods approved for the same analyte. As the method to be used for the analysis of perchlorate will be based upon the currently available single analyte methods for the analysis of perchlorate, EPA will need to conduct a performance evaluation study of labs to approve them for perchlorate monitoring before January 2001. Details of this approval system will be included in a public notice and comment period prior to conducting approval for perchlorate analysis.

(F) Sampling deviations

This section did not change and EPA did not receive any comments on it.

(G) Testing

This section did not change and EPA did not receive any comments on it.

(iii) Small systems that are part of the State Monitoring Plan

In the Preamble of the proposed rule, EPA asked for public comment on whether a random selection of small systems across the nation was appropriate for a representative sample of small systems or a targeted sampling approach based on prior information about contaminant occurrence or use should be applied. Most commenters, and particularly expert technical reviewers, addressing this issue supported the random selection of systems as an unbiased, scientifically sound approach.

EPA determined after consulting statisticians inside and outside EPA that a targeted approach would increase sampling errors unless the sample size is increased. A random sample is necessary to provide small system data roughly equivalent to large system data. Further stratification could introduce non-random sampling errors unless the sample size is increased. Targeted monitoring may also miss the target area if little is known about the actual location of use of a contaminant or if the contaminant is used beyond the specified target area. Additionally, surface waters will carry contaminants beyond the target area to surface water supplied drinking water systems downstream that need to be considered for UCMR monitoring. Also, targeting would be very difficult with the number of contaminants the UCMR is designed to measure. Finally, stratified sampling also requires extensive knowledge about a variety of factors beyond the fate and transport of a contaminant in the environment.

(A) Frequency

Comments and EPA response were addressed under (ii) Large Systems, above.

(B) Location

Comments and EPA response were addressed under (ii) Large Systems, above.

(C) Sampling deviations

State commenters asked about resampling if sampling errors occurred. EPA modified this paragraph to include provisions for resampling using additional instructions from the State or EPA.

(D) Sample kits

No comments were received on this section. It is unchanged.

(E) Sampling instructions

States indicated that some flexibility was needed within a month's timeframe to accommodate changes in sampling schedules that could not be accounted for up-front. In response, EPA changed the specifications. The State Plan will specify the year and day, plus or minus 2 weeks, to allow flexibility and/or to account for changes related to the State's determination of an alternate vulnerable sampling period. The State may pick another year and day to coincide with compliance monitoring.

(F) Duplicate samples

No comments were received on this section. It is unchanged.

(G) Sampling forms

No comments were received on this section. It is unchanged.

(H) Sample submission

At least ten States expressed concerns about the ability of small system owner/operators to properly collect samples for UCMR requirements, which would, therefore, affect the quality of the UCMR results. These States suggested that they could collect UCMR samples for systems in the State Monitoring Plans since, in most States, the number of small systems would be limited, and some of them already conduct compliance field sampling for small systems.

The rule allows for States to sample. States can address field sampling in their Memorandum of Agreement between the State and EPA. EPA would welcome the assistance of States in collecting samples from small systems to ensure high quality data for future decisions concerning whether or not to regulate unregulated contaminants.

(f) What additional requirements must I follow if my system is selected as an Index system?

This section explains that systems selected as Index systems must help EPA or the State identify appropriate sampling locations and provide information on the wells and intakes that are in use at the time of sampling, on well casing and screen depths (if known) for those wells, and the pumping rate of each well or intake at the time of sampling. However, EPA will provide field technical support to collect samples at index systems and assist the systems with compilation of this information, as well as reporting these data.

Comments were supportive and no substantive changes were made to this section.

(g) What must I do if my system is selected for the Screening Survey or Pre-Screen Testing?

This section explains what is required of large and small systems selected to participate in the Screening Survey or in Pre-Screen Testing. Today's rule notes that large systems must report test results to States and EPA. EPA will be developing guidance for this reporting process.

(h) What is a violation of this rule?

EPA added a new § 141.40(a)(8) that clarifies violations of this rule. This clarification will help public water systems understand the consequences of a failure to monitor. The changes state that any failure to monitor or report will be a monitoring or reporting violation.

2. Requirements for State and Tribal Participation

(a) How can I as the director of a State or Tribal drinking water program participate in unregulated contaminant monitoring, including the State Monitoring Plan for small systems, and the Screening Survey and Pre-Screen Testing of all systems?

Today's final rule incorporates a variety of changes from the proposed rule in response to public comments. Many comments were received requesting that EPA directly implement the UCMR, rather than require States to obtain primacy. In response to these comments, adoption of this rule is no longer a condition of maintaining PWS primacy. EPA will proceed with direct implementation. However, EPA recognizes the important role of the States in this program and has modified the rule to encourage States and EPA to enter into Memoranda of Agreement (MOA) to facilitate State participation and implementation. EPA also recognizes that, in the absence of the option for an MOA, the three-tier monitoring approach of the UCMR would require States to apply for primacy revisions under this program three separate times (separately for each of the three lists) over five years; moreover, the primacy application period extends beyond the start of monitoring for each of the three tiers. Through the MOA, EPA and the State may also address other aspects of this final rule's implementation, including compliance tracking and enforcement.

This section explains that the director of a State or Tribal drinking water program can complete an MOA with EPA that describes the State's or Tribe's activities in accepting or modifying the initial monitoring plan, determining an alternative vulnerable time for sampling, modifying the timing of monitoring, identifying sampling points for small systems, notifying large and small systems of their monitoring responsibilities, providing instructions to systems that are part of the State Monitoring Plan, and participating in the Screening Survey and Pre-Screen Testing.

Regarding the initial plan, EPA will specify the small systems, rather than just their number, and the year and day plus or minus two weeks—rather than the week, month, and year in the proposed rule—that each small system must monitor for List 1 contaminants. A State can request that a system which purchases all its water from another system, as clarified in today's rule, be removed from the initial monitoring list, except if it is required to monitor for contaminants in the distribution system.

Public comments also suggested that States be allowed to remove systems from the monitoring list for justifiable and compelling reasons. States may remove systems from the plan if the systems have closed, merged, or purchase all of their water from another system. However, in response to comments, purchased water systems may be selected to monitor contaminants in the distribution system, since purchased water systems tend to have locations furthest from the treatment plant. In these cases, they would be added to the plan as sampling points in the distribution system for the systems first selected. In a change from the proposed rule, States may now remove systems from the list for other reasons, subject to review by EPA, as long as the decision to remove systems from the list is not based on contaminant occurrence, non-occurrence, or potential vulnerability of a system to a contaminant. Not removing systems based on prior or presumed information about contaminants preserves the statistical principle of an unbiased sample.

A State must explain in the State Plan sent to EPA why it believes a system should be removed, but the final decision rests with EPA, as EPA is responsible for ensuring the integrity of the national representative sample.

Systems are expected to monitor between May 1 and July 31, as the default vulnerable period, but today's rule allows a State to determine if there is a different period when any of the small systems in the initial plan, or any of the large systems that must monitor, are more vulnerable to contamination. If so, a State must notify the affected systems of when they are to take samples. If a State changes the vulnerable time for monitoring, the rule now indicates, in response to comments, that the State should also consider that the effects on modifying the timing of monitoring. The States would notify EPA of their determination through the submission of their revised Plan to EPA.

The proposed rule required States to provide EPA with plans for notifying each PWS selected in the initial or modified monitoring plan of their responsibilities and to provide them with instructions for monitoring. Under today's rule, establishing the State role of informing systems of their responsibilities is part of the State-EPA MOA.

As was the case under the proposed rule, a State entering an MOA with EPA must provide instructions to systems that are part of the State Monitoring Plan implementation; EPA will provide guidance on the instructions. Today's final rule adds new language requiring a State to inform EPA at least 6 months before the first monitoring is to occur if the State plans to do the sampling or to make alternative arrangements for the sampling at systems in the plan. The State also must address the alternative monitoring arrangements in the MOA with EPA. These alternative monitoring arrangements could include the State sampling at small systems, a change from, but not precluded in, the proposed rule.

Today's rule enables States, through a State-EPA MOA, to participate in Screening Survey monitoring by small systems as well as large systems. To participate, a State must review its State Monitoring Plan to ensure that no systems have closed, merged, or purchase water from other systems (unless the system is to conduct microbiological monitoring) and then make any necessary changes. States also must notify selected systems of the Screening Survey requirements.

Under today's rule, States may participate in Pre-Screen Testing in two ways. First, within 60 days of receiving EPA's letter concerning the initiation of Pre-Screen Testing for specific contaminants, a participating State must identify between 5 and 25 systems determined to be representative of the systems most vulnerable to the List 3 contaminants. Second, if Pre-Screen Testing is part of the MOA, a State now must notify each selected system's owner or operator of the Pre-Screen Testing requirements.

Today's rule also notes that if a State decides not to prepare an MOA with EPA to develop the State Monitoring Plan for small systems, the initial plan provided by EPA will become the State Monitoring Plan for a State or Tribe. Under the proposed rule, the initial plan became the State plan if a State did not accept the initial plan or submit a request to EPA to modify the initial plan within 60 days.

A commenter raised concerns about whether Tribal systems would be selected in a random manner to avoid bias toward selecting vulnerable systems. EPA will select Tribal systems at random. The rule treats Tribal systems the same as other systems with equal probability of selection.

A commenter was concerned about who would inform systems of their responsibility to monitor. As noted above, the State still plays a critical role in the successful implementation of the program, including informing the systems. If the State elects not to enter into an MOA, EPA will inform systems of their responsibilities.

Several commenters asked whether States should review List 2 systems in the representative sample at a later date to check the status of the systems prior to the Screening Survey. A provision has been made for later State review of List 2 systems in the State Plan to check system status that may have changed since the initial review.

(b) What if I decide not to enter into an MOA?

This is a new section not included in the proposed rule, although it responds to the previous recognition in the proposed rule that a State may not desire to engage in the process of preparing a State Monitoring Plan. This section indicates that EPA will carry out the functions that the State could have conducted.

(c) Can I add contaminants to the Unregulated Contaminant Monitoring List?

This section explains how seven or more State governors can petition the EPA Administrator to add one or more contaminants to the Unregulated Contaminant Monitoring List.

Except for the numbering of this subsection, it is unchanged from the proposed rule.

(d) Can I waive monitoring requirements?

This section explains that monitoring requirements can be waived only with EPA approval and only under very limited conditions.

Except for the numbering of this subsection, it is unchanged from the proposed rule.

A few commenters inquired as to whether EPA would allow individual systems to be waived from monitoring. The statute only provides for State-wide waivers.

C. Appendix A—Quality Control Requirements for Testing All Samples Collected Under § 141.40

This appendix specifies the requirements that a system must follow to control the quality of samples collected and submitted under § 141.40. Areas covered are sample collection/preservation, method detection limit, calibration, reagent blank analysis, quality control sample, matrix spike and duplicate, internal standard calibration, method performance test, detection confirmation, and reporting.

In response to public comments, a few minor technical modifications have been made to the Appendix, modifying specifications for calibration, matrix spikes and matrix spike duplicates, and the number of significant digits specified for MRLs.

D. Section 142.15—Reports by States

Section 142.15(c)(3) is replaced in its entirety by the term "Reserved" in today's final regulation because States will not go through a primacy revision process but may be reviewing the data for quality control purposes before EPA places them in the NCOD. The wording in the proposed rule is, therefore, not included.

E. Section 142.16—Special Primacy Requirements

Section 142.16(e) is revised to delete references to § 141.40 that are no longer relevant.

VIII. General Issues From Public Comment and EPA Response

Several additional issues were raised during the technical peer review and public comment processes. They are summarized and addressed next.

A. Data Quality

One commenter indicated that data quality objectives should determine confidence bounds for occurrence and exposure estimates and that resulting DQOs should be maintained for all system sizes. Many data quality specifications, such as confidence levels for the representative sample, are presented in F., Representative sample of systems serving 10,000 persons or fewer. EPA will publish other Data Quality Objectives for the UCMR in the Quality Assurance Project Plan for the program.

Commenters indicated that EPA should give balanced attention to both false negatives and false positives in establishing analytical methods and quality control procedures for the contaminants on the UCMR List. The Agency has evaluated analytical methods developed by both EPA and other voluntary consensus standards organizations that publish analytical methods, such as Standard Methods and the American Society for Testing and Materials. The Agency has not approved analytical methods published only in analytical journals or methods that use techniques that cannot routinely be used by all drinking water analysis laboratories (e.g., acid, base/neutral fractionation, or packed column gas chromatography). Because control of "false negatives" is essential to the quality of the data collected under this

final regulation, documentation of the contaminants' stability under the sample and extract holding conditions specified in the analytical method were also evaluated.

B. EPA Funding for Small System Testing

Commenters were concerned about small system testing for which EPA is to pay the costs. They suggested that if there is reduced funding, then EPA should reduce the list, sampling frequency or number of systems sampled. EPA currently has sufficient funds for this rule. If for some reason, funds are reduced, EPA will consider a range of options to respond to this circumstance, but in all cases would ensure that the rule would not impose a significant economic impact on small entities.

C. Lab Certification

Commenters were concerned that EPA needs to identify steps and procedures necessary to maintain certification for unregulated contaminant analysis and clarify how States are to certify laboratories in time for implementation of the rule. EPA will maintain the process for laboratory certification as it is. The rule provides an automatic certification of laboratories that are certified for the same methods applied to at least one other contaminant. No separate certification is required under the current UCMR.

D. Research

Commenters indicated that EPA should commit research funds for Aeromonas and preservation process studies. EPA is developing a detailed research agenda with its Office of Research and Development in support of the contaminants on the CCL.

E. Regulation Format

Some State commenters indicated that they may not be able to incorporate this regulation by reference because it is in question-and-answer format. EPA is no longer requiring States to have primacy to implement the UCMR, so the States will not have to incorporate the UCMR into their regulations. However, States will still be able to participate in the State Monitoring Plan as specified in a Memorandum of Agreement between the State and EPA.

F. Voluntary Data Submittal

One commenter indicated that EPA should encourage voluntary source water data if standardized methods were utilized to substantiate treatment needs. EPA will pursue obtaining data from other reliable sources since additional data will help inform decision processes. Source water data are available from other agencies.

IX. Other Changes Related to the Regulation

A. Implementation of the Rule

Implementation issues addressed in today's final rule include setting an effective date, instituting a memorandum of agreement (MOA) process with interested States; establishing the laboratory testing program; continuing research on methods development; determining the representative national sample and associated State Plans; conducting the sampling, analysis, and reporting; and allowing previously collected monitoring data. The UCMR program, as revised by today's final rule, is illustrated in Figure 1, "Unregulated Contaminant Monitoring Approach." A critical part of this program is funding the testing of samples from the national representative sample of small systems.

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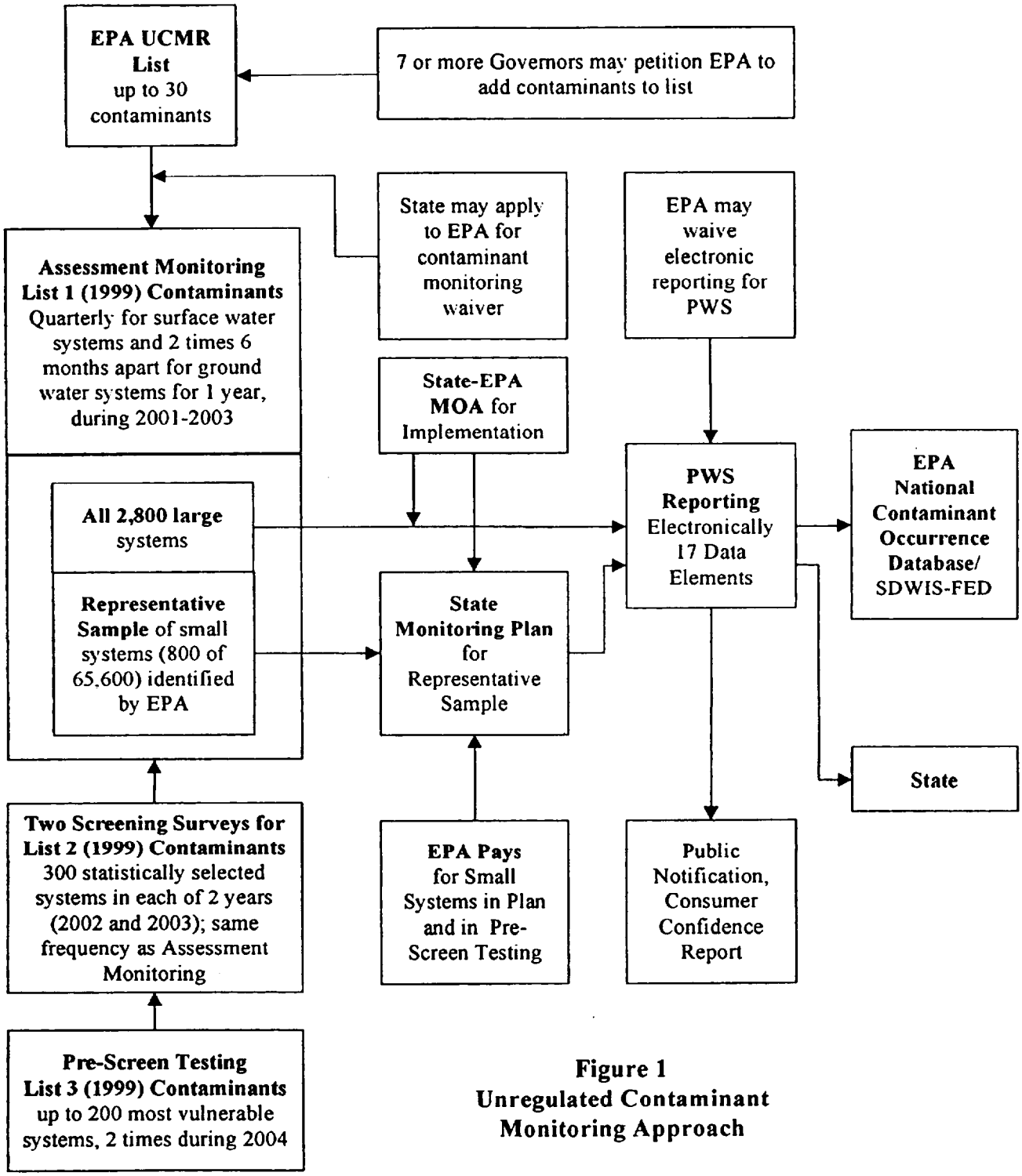

Figure 1
Unregulated Contaminant Monitoring Approach

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1. Setting an Effective Date

EPA has testing methods which are expected to give reliable and reproducible results for 10 of the contaminants on the UCMR Monitoring List to be tested for under Assessment Monitoring. These methods are widely used in the drinking water industry, although not necessarily for the listed contaminants. Testing for these contaminants, and other information about them, will help EPA determine whether to regulate them. Results of the UCMR testing should be available before the next revision of the CCL, in February 2003. Additionally, prior to initiation of the monitoring resulting from this rule, EPA must establish laboratory analysis contracts with laboratories that will do the testing and associated activities (including setting up a database and electronic reporting process) establish Memoranda of Agreement with States to implement the rule, and develop the national representative sample and send each State its allocation for review. Therefore, EPA has set January 1, 2001, as the effective date of the UCMR program, approximately16 months from the promulgation of this final rule. Shortly after this rule is promulgated, EPA will issue another rulemaking for public comment to add methods for perchlorate and acetochlor which were not previously on List 1. This action will allow these contaminants to be tested in 2001 and may allow data collected prior to the effective date to be used to meet the requirements of this final rule.

The 16-month period will enable States to enter into MOAs with EPA to provide support for the implementation of this final rule, to review the initial State Monitoring Plans, and to inform small PWSs of their selection and their responsibilities for monitoring. EPA will use this time to establish its laboratory program to test samples from small systems. Analytical methods are already in use for the contaminants to be tested for under Assessment Monitoring, so 16 months should be sufficient for laboratories that serve large systems to organize and implement the testing program, especially given the assistance provided by the methods and quality control manual. EPA is working to ensure that the manual and the contaminant occurrence reporting guidance documents are available to allow the program's implementation at that time. The requirements for small systems and the sampling and quality control procedures for all systems are specified in § 141.40(a)(3), (4), and (5) and in Appendix A. Figure 2 shows the timing of the major components and activities supporting the UCMR program.

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40 CFR Parts 9, 141 and 142
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ENVIRONMENTAL PROTECTION AGENCY

40 CFR Parts 9, 141 and 142

[FRL-6433-1]

RIN 2040-AD15

Revisions to the Unregulated Contaminant Monitoring Regulation for Public Water Systems

AGENCY: Environmental Protection Agency.

ACTION: Final rule.

SUMMARY: The Safe Drinking Water Act (SDWA), as amended in 1996, requires the U.S. Environmental Protection Agency (EPA) to establish criteria for a program to monitor unregulated contaminants and, by August 6, 1999, to publish a list of contaminants to be monitored. To conform to the Amendments, today EPA is promulgating the Unregulated Contaminant Monitoring Regulation (UCMR) for Public Water Systems (PWSs), which revises substantially the existing regulations for unregulated contaminant monitoring.

This final rule includes a list of contaminants to be monitored, procedures for selecting a representative nationwide sample of small PWSs that will be required to monitor, the frequency and schedule for monitoring, the sampling points, the approved analytical methods to be used, and procedures for entering the monitoring data in the National Drinking Water Contaminant Occurrence Database (NCOD), as required under section 1445 of SDWA, as amended. The data in the database will be used to identify contaminants on the Drinking Water Contaminant Candidate List (CCL), to support the Administrator's determination of whether or not to develop drinking water standards for a particular contaminant, and to develop standards for the contaminants that the Administrator selects.

DATES: *Effective Date*: The final rule is effective January 1, 2001.

For purposes of judicial review, this final rule is promulgated as on 1 p.m. Eastern time on October 1, 1999 as provided in 40 CFR 23.7.

The incorporation by reference of the publications listed in today's rule is approved by the Director of the **Federal Register** as of January 1, 2001.

ADDRESSES: Documents relevant to this action are available for inspection from 9 a.m. to 4 p.m. Monday through Friday, excluding legal holidays, at the Water Docket, East Tower Basement, U.S. EPA, 401 M Street, SW, Washington DC. For access to docket (Docket No. W-98-02) materials, please call (202) 260-3027 between 9 a.m. and 3:30 p.m. Eastern Time, Monday through Friday, to schedule an appointment. A reasonable fee may be charged for copying.

FOR FURTHER INFORMATION CONTACT: Charles Job, Standards and Risk Management Division, Office of Ground Water and Drinking Water (MC-4607), U.S. Environmental Protection Agency, 401 M Street, SW, Washington, D.C. 20460, (202) 260-7084. General information may also be obtained from the EPA Safe Drinking Water Hotline. Callers within the United States may reach the Hotline at (800) 426-4791. The Hotline is open Monday through Friday, excluding federal holidays, from 9:00 a.m. to 5:30 p.m. Eastern Time.

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Abbreviations and Acronyms Used in the Preamble and Final Rule

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
Alachlor ESA—alachlor ethanesulfonic acid, a degradation product of alachlor
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
BGM—Buffalo Green Monkey cells, a specific cell line used to grow viruses
CAS—Chemical Abstract Service
CASRN—Chemical Abstract Service Registry Number
CCL—Contaminant Candidate List
CCR—Consumer Confidence Reports
CERCLA—Comprehensive Environmental Response, Compensation & Liability Act
CFR—Code of Federal Regulations
CFU—colony forming unit
CFU/mL—colony forming units per milliliter
CWS—community water system
DCPA—dimethyl tetrachloroterephthalate, chemical name of the herbicide dacthal
DCPA mono- and di-acid degradates—degradation products of DCPA
DDE—dichloro dichlorophenyl ethylene, a degradation product of DDT
DDT—dichloro diphenyl trichloroethane, a general insecticide
DNA—deoxyribonucleic acid
EDL—estimated detection limit
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
FACA—Federal Advisory Committee Act
FTE—full-time equivalent
GC—gas chromatography, a laboratory method
GLI method—Great Lakes Instruments method
GW—ground water
GWUDI—ground water under the direct influence (of surface water)
HPLC—high performance liquid chromatography, a laboratory method
ICR—Information Collection Request/Rule
IRFA—initial regulatory flexibility analysis
IMS—immunomagnetic separation
IRIS—Integrated Risk Information System
IS—internal standard
LLE—liquid/liquid extraction, a laboratory method
MAC—*Mycobacterium avium* complex
MOA—Memorandum of Agreement
MCL—maximum contaminant level
MDL—method detection limit
MRL—minimum reporting level
MS—mass spectrometry, a laboratory method
MSD—sample matrix spike duplicate
MTBE—methyl-tertiary-butyl-ether, a gasoline additive
NAWQA—National Water Quality Assessment Program
NCOD—National Drinking Water Contaminant Occurrence Database
NDWAC—National Drinking Water Advisory Council
NERL—National Environmental Research Laboratory
NPS—National Pesticide Survey
NTIS—National Technical Information Service
NTNCWS—non-transient non-community water system
NTTAA—National Technology Transfer and Advancement Act
OGWDW—Office of Ground Water and Drinking Water
OMB—Office of Management and Budget
PAH—Poly-aromatic hydrocarbon
PB—particle beam
PBMS—Performance-Based Measurement System
pCi/L—picocuries per liter
PCR—polymerase chain reaction

^{210}Pb—Lead-210 (also Pb-210), a lead isotope and radionuclide; part of the uranium decay series
^{210}Po—Polonium-210 (also Po-210), a polonium isotope and radionuclide; part of the uranium decay series
PWS—Public Water System
PWSF—Public Water System Facility
QA—quality assurance
QC—quality control
RDX—royal demolition explosive, hexahydro-1,3,5-trinitro-1,3,5-triazine
RFA—Regulatory Flexibility Act
RPD—relative percent difference
RSD—relative standard deviation
SBREFA—Small Business Regulatory Enforcement Fairness Act
SD—standard deviation
SDWA—Safe Drinking Water Act
SDWIS—Safe Drinking Water Information System
SDWIS FED—the Federal Safe Drinking Water Information System
SM—Standard Methods
SMF—Standard Compliance Monitoring Framework
SMS—sample matrix spike
SOC—synthetic organic compound
SPE—solid phase extraction, a laboratory method
SRF—State Revolving Fund
STORET—Storage and Retrieval System
SW—surface water
TBD—to be determined
TNCWS—transient non-community water system
UCMR—Unregulated Contaminant Monitoring Regulation/Rule
UCM—Unregulated Contaminant Monitoring
UMRA—Unfunded Mandates Reform Act of 1995
USEPA—United States Environmental Protection Agency
UV—ultraviolet
VOC—volatile organic compound
µg/L—micrograms per liter

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Potentially Regulated Entities

The regulated entities are public water systems. All large community and non-transient non-community water systems serving more than 10,000 persons are required to monitor. A community water system (CWS) means a public water system which serves at least 15 service connections used by year-round residents or regularly serves at least 25 year-round residents. Non-transient non-community water system (NTNCWS) means a public water system that is not a community water system and that regularly serves at least 25 of the same persons over 6 months per year. Only a national representative sample of community and non-transient non-community systems serving 10,000 or fewer persons would be required to monitor. Transient non-community systems (i.e., systems that do not regularly serve at least 25 of the same persons over six months per year) would not be required to monitor. States, Territories, and Tribes, with primacy to administer the regulatory program for public water systems under the Safe Drinking Water Act sometimes conduct analyses to measure for contaminants in water samples and are regulated by this action. Categories and entities potentially regulated by this action include the following:

Category	Examples of potentially regulated entities	SIC
State, Territorial and Tribal Governments	States, Territories, and Tribes that analyze water samples on behalf of public water systems required to conduct such analysis; States, Territories, and Tribes that themselves operate community and non-transient non-community water systems required to monitor.	9511
Industry	Private operators of community and non-transient non-community water systems required to monitor.	4941
Municipalities	Municipal operators of community and non-transient non-community water systems required to monitor.	9511

This table is not intended to be exhaustive, but rather provides a guide for readers regarding entities likely to be regulated by this action. This table lists the types of entities that EPA is now aware of that could potentially be regulated by this action. Other types of entities not listed in the table could also be regulated. If you have questions regarding the applicability of this action to a particular entity, consult the person listed in the preceding **FOR FURTHER INFORMATION CONTACT** section.

I. Statutory Authority

SDWA section 1445(a)(2), as amended in 1996, requires EPA to establish criteria for a program to monitor unregulated contaminants and to publish, by August 6, 1999, a list of contaminants to be monitored. To meet these requirements, today's rule EPA substantially revises the existing Unregulated Contaminant Monitoring (UCM) Program, which is codified at 40 CFR 141.40. This final rule revises the regulations at 40 CFR 9.1, 141.35, 141.40, 142.16 and deletes and reserves 142.15(c)(3). The rule covers: (1) the frequency and schedule for monitoring, based on PWS size, water source, and likelihood of finding contaminants; (2) a new, shorter list of contaminants for which systems will monitor; (3) procedures for selecting and monitoring a nationally representative sample of small PWSs (those serving 10,000 or fewer persons), and; (4) procedures for entering the monitoring data in the National Drinking Water Contaminant Occurrence Data Base (NCOD), as required under section 1445.

II. Major Program Revisions

Since its inception in 1988, the UCM Program has collected occurrence data to help EPA determine which contaminants EPA should regulate based on contaminant concentrations in PWSs and the contaminants' adverse health effects levels. Today's rule is designed to improve and enhance this program in several important ways:

(1) A statistical approach to select only 800 representative systems for monitoring from the national total of 65,600 small systems reduces the monitoring burden of the water supply industry; the burden on small systems is significantly further reduced in that EPA will pay for virtually all of the costs associated with monitoring for the small systems that are part of the representative sample;

(2) A smaller number of contaminants to be monitored also reduces the testing and reporting burden of the water industry overall;

(3) The required information to be reported about each contaminant has been refined to improve the data quality for regulatory decisions; and

(4) Direct reporting of data for regulatory determination and development from systems to EPA reduces State reporting burden, and the opportunity for electronic reporting reduces the potential for data entry and submission.

A three-tier monitoring approach allows monitoring to start promptly for contaminants with approved analytical methods, while accommodating the need to delay implementation for contaminants needing further methods development. The rule also allows use of a State-EPA Memorandum of

Agreement, providing direct implementation in each State rather than implementation through primacy revisions, to address the three-tiered approach of the UCMR.

This program is a cornerstone of the "sound science" approach to future drinking water regulations, which is a goal of the 1996 SDWA Amendments. Data generated by this final rule will be used to: (1) evaluate and prioritize contaminants on the Contaminant Candidate List (CCL) and refine the CCL; (2) support the Administrator's determination of whether to regulate a contaminant under the drinking water program; and, (3) support the development of drinking water regulations.

In a related, cost-savings action, EPA published a Direct Final Rule (64 FR 1494) on January 8, 1999, suspending the monitoring requirements in effect for small systems serving 10,000 or fewer persons. The third round of monitoring by small systems under the existing list of unregulated contaminants would have overlapped with the monitoring required under this final rule. The Direct Final Rule saved small systems and States the cost of unnecessary monitoring. EPA believes it obtained sufficient data from the previous monitoring rounds to make decisions concerning the occurrence of the unregulated contaminants on its prior monitoring list for these systems. Large systems were not included in this Direct Final Rule since they had already begun the third round of monitoring in January 1998. This large system monitoring will provide confirming information on the occurrence of those contaminants. However, this final regulation cancels further monitoring by large systems for the existing list of contaminants effective January 1, 2001. Until that date, large systems must continue to monitor for the 48 contaminants listed in 40 CFR 141.40 (and also listed in Table 1 of "Revisions to the Unregulated Contaminant Monitoring Regulation for Public Water Systems," **Federal Register**, vol. 64, no. 83, April 30, 1999, p. 23401 (64 FR 23401)).

III. Regulatory Background

The requirements for unregulated contaminant monitoring were first established by the 1986 SDWA Amendments. Under this law, EPA implemented the drinking water standards in phases, with each phase having a set of contaminants for which maximum contaminant levels in drinking water were established. The phases also included unregulated contaminants for which more information was needed before decisions could be made regarding regulation of the contaminants. EPA included unregulated contaminant monitoring requirements in the Phase I chemical regulation, under 40 CFR 141.40(a)–(c). The Phase II regulation later superceded the Phase I rule, and some of the Phase I unregulated contaminants became regulated under Phase II. Additional contaminants were also added to the list of unregulated contaminants. The Phase V chemical regulation further modified the list of contaminants, as additional unregulated contaminants became regulated.

The basic monitoring and reporting requirements for unregulated contaminants were the same under the Phase I, Phase II, and Phase V regulations. PWSs were required to report their monitoring results to the primacy agencies (either the State or EPA), with States, in turn, reporting to EPA. Only systems serving fewer than 150 service connections were exempt from monitoring—provided they made their facilities available for monitoring by the States. Repeat monitoring was required every 5 years.

Section 125 of the 1996 SDWA Amendments substantially revised unregulated contaminant monitoring program. The new program includes: (1) a new list of contaminants (i.e., the Unregulated Contaminant Monitoring Regulation (UCMR) (1999) List; (2) a representative sample of PWSs serving 10,000 or fewer persons to monitor; (3) placement of the monitoring data in the NCOD, and; (4) notification of consumers that the monitoring results are available.

The 1996 amendments limit the number of contaminants to be monitored on the UCMR list to a maximum of 30. The amendments specify that only a representative sample of small systems are required to monitor, and that EPA must pay the reasonable costs of analyzing the samples taken by those systems. EPA will use the data generated by this monitoring effort in the development of future drinking water regulations.

Today's final rule will completely replace the requirements of the existing rule on the final rule's effective date of January 1, 2001. The existing requirements of 40 CFR 141.35 and 141.40 still apply to large systems serving more than 10,000 persons, (since their third round of monitoring had begun in January 1998) until January 1, 2001, as noted above in II. Major Program Revisions.

IV. Process of Preparing the Final Rule

EPA has been developing the final revisions to the Unregulated Contaminant Monitoring Regulation (UCMR) for public water systems since 1997. In December, 1997, EPA's UCMR development workgroup held a stakeholders meeting to obtain input from the public on major issues and options affecting the program and emanating from the Safe Drinking Water Act, as amended in 1996. EPA held a second stakeholders meeting in May 1998, on options under serious consideration for the UCMR. EPA engaged eleven external expert reviewers from March 1 through April 22, 1999 to examine and comment on the technical aspects of the proposed rule. These technical reviewers evaluated and commented on the chemical and microbiological contaminant analytical methods and reporting requirements, the statistical approach for the representative sample of small systems, and the sampling and monitoring approach. The comments of the technical reviewers were available to the public through the official docket and on the Internet through EPA's Office of Ground Water and Drinking Water electronic homepage.

EPA published the proposed rule in the **Federal Register** on April 30, 1999, for public comment. The comment period closed on June 14, with submissions from 39 commenters meeting the deadline and addressing all major aspects of the proposed regulation. EPA received one hundred sixteen comments after the public comment period closed, principally concerning the inclusion of perchlorate on the UCMR monitoring list. EPA considered and addressed all comments in the process of developing this final regulation.

V. Concise Description of Today's Action

A. Which Systems Must Monitor

Owners and operators of community and non-transient noncommunity water systems must monitor for unregulated contaminants if they serve more than 10,000 persons or if they are part of the representative sample of small systems serving 10,000 or fewer persons that will be randomly selected to monitor for these contaminants. Transient systems are not required to monitor for unregulated contaminants. Only purchased water systems that are identified by EPA or the State to sample at locations of low disinfectant residual or longest residence time are required to monitor for distribution system contaminants.

B. System Monitoring Requirements

The contaminants included in this action are: 2,4-dinitrotoluene, 2,6-dinitrotoluene, DCPA mono acid degradate, DCPA di acid degradate, 4,4'-DDE, EPTC, molinate, MTBE, nitrobenzene, terbacil, acetochlor, and perchlorate. Systems must also analyze for water quality parameters including, for chemical contaminants: pH; and for microbiological contaminants: pH, temperature, turbidity, free disinfectant residual and total disinfectant residual. Surface water systems must monitor during four consecutive quarters. Ground water systems must monitor two times five to seven months apart. One sampling event for surface and ground water systems must be during the vulnerable time of May 1 to July 31, or during an alternate vulnerable time selected by the State. Monitoring must be conducted at the entry point to the distribution system, or at other sampling locations previously specified by the State for compliance monitoring, for sampling points representative of each principal, non-emergency water source in use over the one year of monitoring. Large and small systems must monitor according to the quality control procedures described. Laboratories that are certified to use the indicated methods for the contaminants listed are automatically certified to analyze for unregulated contaminants. Small systems that are part of the representative sample which become part of State Monitoring Plans must follow instructions given them for unregulated contaminant sampling and shipment to the designated laboratory.

C. System Reporting Requirements

After testing for the contaminants on the monitoring list, the systems must report the results electronically to, or in an alternate format previously arranged with, EPA within 30 days following the month they receive the results. EPA will report the results for the small systems that are selected to be part of the State Monitoring Plans. EPA will hold the data for 60 days to allow for quality control review by systems and States before placing the data in the National Drinking Water Contaminant Occurrence Database.

Data required to be reported include: Public Water System (PWS) Identification Number; Sample Identification Number; Sample Collection Date; Contaminant/Parameter; Analytical Results—Sign; Analytical Result—Value; Analytical Result—Unit of Measure; Analytical Method Number; Public Water System Facility Identification Number—Source, Treatment Plant and Sampling Point; Sample Analysis Type; Detection Level; Detection Level Unit of Measure; Batch Identification Number; Spiking Concentration; Analytical Precision; Analytical Accuracy; Presence/Absence.

A system can have a laboratory report the results for it, but the system retains the responsibility for reporting. A system can report previously collected data as long as the data meet the requirements specified in 40 CFR 141.40(a) (3), (4), (5) and Appendix A and include the applicable water quality parameters and data listed previously that are required to be reported.

D. State and Tribal Participation

States and Tribes can enter into a Memorandum of Agreement (MOA) with the EPA concerning the implementation of the monitoring program. The MOA must address the following: accepting or modifying the State Monitoring Plan for small systems, determining an alternate vulnerable time, modifying the timing of monitoring, identifying sampling points for small systems, notifying small and large systems of their monitoring responsibilities, and providing instructions to systems. A State can remove a system from the State Monitoring Plan, after EPA review, as long as removal is not based on prior information on the occurrence or non-occurrence of contaminants at the system or the vulnerability of the system to the contaminants. States can decide not to participate in an MOA, in which case the EPA will establish a State Monitoring Plan. The governors of seven or more States can petition EPA to add contaminants to the monitoring list. States can apply to EPA to waive monitoring for large systems if they can demonstrate that the contaminants for which a monitoring waiver is sought have not occurred in the State in the past 15 years.

VI. Final Changes in the Unregulated Contaminant Monitoring Program

A. Revised List of Unregulated Contaminants To Be Monitored

1. Criteria for Selecting Contaminants for the UCMR

(a) Revising the UCMR (1999) List

Section 1445(a)(2)(B) requires EPA to list not more than 30 unregulated contaminants to be monitored by public water systems. EPA used the 1998 Contaminant Candidate List (CCL), established under section 1412(b)(1)(B) of SDWA, as the primary basis for selecting contaminants for future monitoring under the UCMR. Development of the CCL is discussed in the preamble to the proposed rule at 64 FR 23402. EPA believes, and nearly all public commenters addressing the use of the CCL as the basis for the UCMR List indicated, that the CCL process already uses the best available information on contaminants of concern and emerging contaminants that may need regulation. SDWA section 1445 (a)(2)(B)(ii) provides for the governors of seven or more States to petition the Agency to add contaminants to the UCMR List. This petition process allows for the flexibility to include contaminants that are emerging as concerns between the five-year listing cycles.

The CCL lists 26 chemical and 8 microbiological contaminants as occurrence priorities because additional data on their occurrence in drinking water are needed to help decide whether they should be regulated. The proposed rule did not address the two contaminants identified in the preparation of the CCL as highly localized in occurrence: perchlorate and RDX (hexahydro-1,3,5-trinitro-1,3,5-triazine). EPA now has information indicating that the occurrence of these contaminants is more widespread than originally thought. In response to this information, some of which was provided in public comments, EPA has added perchlorate and RDX to the final UCMR (1999) List. Perchlorate was added to the UCMR (1999) List because EPA feels that there is enough information on its occurrence in public water systems to warrant its inclusion in a national monitoring program. Since it was not included on the proposed UCMR (1999) List, EPA did not take comment on its analytical method, minimum reporting level, or sampling location. EPA is currently engaged in final validation of an analytical method for perchlorate. This validation is important because earlier analytical methods did not make adjustments for interferences from sulfate and chloride, thus reducing or eliminating detected concentrations. EPA feels that with this validation, the analytical method should be sufficiently ready for monitoring, and thus EPA has included perchlorate on the UCMR List 1. EPA plans to publish, for public comment, the analytical method, minimum reporting level, and sampling location for perchlorate shortly after the promulgation of this final rule. RDX now appears on UCMR (1999) List 2, indicating that additional information is available, and initial monitoring of occurrence in public water systems should occur but that its method needs further refinement.

Additionally, based on technical peer review and public comments, EPA moved Aeromonas from UCMR (1999) List 1 to UCMR (1999) List 2 in Table 1, because its analytical method is not expected to be validated until 2000 or 2001. Also, in response to public comments that the Agency include as many contaminants that could be tested under the same multi-analyte method as possible in Assessment Monitoring, EPA moved acetochlor to List 1 from List 2. This action is based on information that only minor refinements are needed in the method and those can be resolved before the effective date of today's rule. As a result, the analytical method is reserved until the details of the method are resolved. EPA plans to publish a revision to this final rule to approve an analytical method for acetochlor shortly after this rule's promulgation. EPA will likely publish a joint request for public comment on the analytical methods for perchlorate and acetochlor. EPA intends to approve and publish the methods as early as possible to allow monitoring to begin on January 1, 2001, and to allow for the reporting of any data obtained prior to January 1, 2001 to meet the requirements of this final Rule.

For the remaining contaminants on the CCL Occurrence Priorities List, EPA has evaluated the availability of analytical methods published by EPA or voluntary consensus standards organizations, such as the American Society for Testing and Materials (ASTM) and Standard Methods (SM). In addition, EPA prioritized analytical methods development activities for those compounds and microorganisms for which suitable analytical methods are not currently available. As listed in List 1 of Table 1, EPA identified 10 of the 12 listed chemical contaminants for which analytical methods are now available. UCMR (1999) List 1 contaminants are those for which monitoring is required under today's Rule, with the added note that analytical methods have yet to be approved for perchlorate and acetochlor. UCMR (1999) List 2 of Table 1 lists 16 contaminants for which analytical methods are being refined: 14 chemical contaminants, Aeromonas (a microorganism), and polonium-210 (discussed in Table 1). UCMR (1999) List 3 of Table 1 identifies seven microbiological contaminants and lead-210 for which analytical methods are being researched. Monitoring for contaminants on UCMR (1999) Lists 2 and 3 is not required until EPA promulgates revisions to this rule to specify analytical methods and related sampling requirements for them.

EPA requested comment on the addition to the UCMR (1999) List of two naturally occurring radionuclides with health concerns at low levels, lead-210 (pb-210), and polonium-210 (po-210). Both nuclides are in the uranium decay series, which also includes radium-226 and radon-222. Lead-210, with a half-life of 22 years, and one of its degradates, polonium-210, with a half-life of 138 days, have been found in drinking water. EPA is aware of the occurrence of these contaminants in shallow aquifers in Florida (Harada, et al., 1989; Upchurch, 1991), and in at least two other States. Because of potential occurrence, consequent health risks, and in response to public comments, EPA has added polonium-210 and lead-210 to the UCMR (1999) List and has placed them on Lists 2 and 3 respectively.

(b) Regulatory Approach for the UCMR (1999) List

EPA establishes in § 141.40(a)(3) that the contaminants listed in Lists 1–3 comprise the UCMR (1999) List, categorized based on the availability of analytical methods. UCMR (1999) List 1 is the basis for Assessment Monitoring. Assessment Monitoring will occur at all 2,774 large community and non-transient non-community public water systems serving more than 10,000 persons and at a representative sample of approximately 800 systems serving 10,000 or fewer persons identified in State Monitoring Plans. UCMR (1999) List 2 will be the basis for two Screening Surveys of approximately 300 systems each, statistically selected from those systems required to conduct Assessment Monitoring. UCMR (1999) List 3 will be used for Pre-Screen Testing at up to 200 systems selected because of their potential vulnerability to the specific contaminants. This monitoring approach is described in detail under Section VI.C, "Type of Monitoring Required of Public Water Systems Based on Listing Group." Assessment Monitoring (and associated "Index system" monitoring) is the only monitoring that would be required by today's action. This includes contaminants for which EPA expects to have developed analytical methods before implementation: perchlorate and acetochlor.

For contaminants on UCMR (1999) List 2 for which analytical methods are developed by the time of initial monitoring in 2001, EPA will amend this rule to require the first Screening Survey to be conducted at selected systems. For those contaminants on List 2 and List 3 that do not have well developed methods by the time of initial monitoring in 2001, EPA will issue a revision to this regulation to activate monitoring for them at the time when the methods are considered implementable, up to the limit of 30 contaminants to be monitored within the five-year contaminant listing cycle. Monitoring for those contaminants will then begin at a date specified in that prospective regulation. Therefore, monitoring of contaminants on UCMR (1999) Lists 2 and 3 is not required by today's action. Monitoring of these contaminants will only occur when EPA publishes a revision to this regulation specifying the analytical methods to be used and the period during which monitoring is to be completed.

(c) Analytical Methods Applicable to the UCMR (1999) List

The UCMR (1999) List development process focuses primarily on the availability of analytical methods for the listed contaminants and the level of information available for them at the time of its development. The discussion below highlights analytical method considerations in listing the contaminants for monitoring. Only the contaminants identified on UCMR (1999) List 1, will be monitored as a result of today's action, with the exceptions of perchlorate and acetochlor, for which analytical methods have yet to be approved. Contaminants on UCMR (1999) Lists 2 and 3 are included on the final UCMR (1999) List, but will not be activated for monitoring until EPA proposes and promulgates analytical methods that can be used to reliably measure their occurrence in drinking water. At that time, EPA will propose regulations for the monitoring of UCMR (1999) List 2 and 3 contaminants.

(i) Chemical Analytical Methods

The ability to correctly identify a chemical contaminant is directly related to the type of chemical and the analytical method used. Compounds such as disinfection byproducts are far less likely to be misidentified than pesticides because they are typically present at relatively high concentrations in disinfected waters, while pesticides are much less likely to occur, or occur at lower concentrations. The analytical method selected will determine the accuracy of the qualitative identification. In general, the most reliable qualitative identifications will come from methods that use mass spectral data for contaminant identification. However, these methods are typically less sensitive than methods that rely on less selective detectors.

Before EPA establishes a Maximum Contaminant Level (MCL), the Agency relies on an analytical method suitable for routine monitoring. It is likely that analytical methods in general use by laboratories performing drinking water analyses may not exist for some of the final compounds to be measured in the UCMR program. Complex analytical methods or methods requiring special handling often require more experienced laboratories than the laboratories performing routine compliance monitoring. Even when analytical methods that are in general use by analytical laboratories are available, limiting the analyses to a small number of laboratories operating under strict quality control requirements improves the precision and accuracy of the analyses, thereby increasing the usefulness of the data.

The option favored by many stakeholders for conducting the chemical laboratory analyses and made final today by EPA is the following:

For PWSs serving more than 10,000 people, the PWS is responsible for sample collection and analyses for Assessment Monitoring. This monitoring may be conducted at the same time as the required compliance monitoring, to the extent possible. For Assessment Monitoring, however, EPA requires in § 141.40(a)(3) and § 141.40 Appendix A, quality control procedures for both sampling and testing to ensure that the data collected under this regulation are of sufficient quality to meet the requirements of the related regulatory decisions. Thus, today's action specifies the analytical methods and procedures to be used in obtaining these data. The sampling and associated quality control requirements cover time frame, frequency, sample collection and submission, and review and reporting of results. The laboratory analytical quality control requirements address the use of a certified laboratory, sample collection/preservation, analytical methods, method detection limits, calibration, quality control samples, method performance tests, detection confirmation, and reporting. PWSs serving 10,000 or fewer persons must send their Assessment Monitoring samples to laboratories designated by EPA, since the Agency must pay for the reasonable costs of testing.

The purpose of the quality control requirements is to ensure that, since EPA will only be able to obtain results from 3,574 systems (2,774 large systems and a representative sample of 800 systems from 65,600 systems serving 10,000 or fewer persons), the Agency obtains the most reliable data possible. EPA is specifying the use of certain analytical methods that are currently available for monitoring (see Table 3. UCMR (1999) List, column 3). While these methods are routinely used by commercial and public water system laboratories (including some that are currently used for compliance monitoring), they have not been routinely used for the contaminants on the UCMR (1999) List. Note that, as shown in § 141.40(a)(3), Table 1, 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 Appendix A.

For the compounds included in this regulation, the following summary, Table 1, Status of Analytical Methods for Chemical Contaminants on the UCMR (1999) List, presents a brief overview of methods availability for each chemical contaminant.

TABLE 1.—STATUS OF ANALYTICAL METHODS FOR CHEMICAL CONTAMINANTS ON THE UCMR (1999) LIST

	CAS No.	Analytical methods	Status of availability
UCMR (1999) List 1—Chemical Contaminant			
2,4-dinitrotoluene	121-14-2	EPA 525.2	Method is adequate for monitoring.
2,6-dinitrotoluene	606-20-2	EPA 525.2	Method is adequate for monitoring.
4,4'-DDE	72-55-9	EPA 508	Methods are adequate for monitoring.
		EPA 508.1	
		EPA 525.2	
		D5812-96	
		AOAC 990.06	
Acetochlor	34256-82-1	In validation process	EPA anticipates that this compound can be added to the scope of EPA Method 525.2.
DCPA di acid degradate	2136-79-0	EPA 515.1	No method is available to measure the mono and di acid forms separately. All of the approved methods identify total mono and di acid forms.
		EPA 515.2	
		D5317-93	
		AOAC 992.32	
DCPA mono acid degradate	887-54-7	EPA 515.1	No method is available to measure the mono and di acid forms separately. All of the approved methods identify total mono and di acid forms.
		EPA 515.2	
		D5317-93	
		AOAC 992.32	
EPTC	759-94-4	EPA 507	Methods are adequate for monitoring.
		EPA 525.2	
		D5475-93	
		AOAC 991.07	
Molinate	2212-67-1	EPA 507	Methods are adequate for monitoring.
		EPA 525.2	
		D5475-93	
		AOAC 991.07	
MTBE	1634-04-4	EPA 524.2	Methods are adequate for monitoring.
		D5790-95	
		SM6210D	
		SM6200B	
Nitrobenzene	98-95-3	EPA 524.2	Methods are adequate for monitoring.
		D5790-95	
		SM6210D	
		SM6200B	

TABLE 1.—STATUS OF ANALYTICAL METHODS FOR CHEMICAL CONTAMINANTS ON THE UCMR (1999) LIST—Continued

	CAS No.	Analytical methods	Status of availability
Perchlorate	14797–73–0	In validation process	EPA is currently conducting analytical methods development to support the analyses of perchlorate. This new method will be based on the currently available ion chromatography methods, but will include a criteria detailing when a laboratory must perform a sample clean-up procedure to minimize the impact of elevated concentrations of chloride, sulfate or other dissolved solids.
Terbacil	5902–51–2	EPA 507 EPA 525.2 D5475–93 AOAC 991.07	Methods are adequate for monitoring.
UCMR (1999) List 2—Chemical Contaminant			
1,2-diphenylhydrazine	122–66–7	In development	Some methods evaluated but inadequate for monitoring. Priority for analytical method development. EPA anticipates that contaminant will be added to the scope of EPA Method 525.2.
2,4,6-trichlorophenol	88–06–2	In development	EPA Method 552 evaluated but subject to false positives from interferences of the derivitized byproduct of the contaminant. EPA anticipates that contaminant will be included in a new SPE/GC/MS method currently under development.
2,4-dichlorophenol	120–83–2	In development	EPA Method 552 evaluated but subject to quantitative uncertainty due to inadequate derivatization of the contaminant. EPA anticipates that contaminant will be included in a new SPE/GC/MS method currently under development.
2,4-dinitrophenol	51–28–5	In development	Some methods evaluated but inadequate for monitoring. EPA anticipates that contaminant will be included in a new SPE/GC/MS method currently under development.
2-methylphenol	95–48–7	In development	Some methods evaluated but inadequate for monitoring. EPA anticipates that contaminant will be included in a new SPE/GC/MS method currently under development.
Alachlor ESA and degradation byproducts of acetanilide pesticides.		To be determined	EPA is evaluating which specific contaminants will be included within this group of compounds. Analytical methods will be determined for the targeted contaminants.
Diazinon	333–41–5	In development	Diazinon is listed as a contaminant in several EPA and voluntary consensus standard organization methods but it is subject to rapid aqueous degradation. Preservation research currently being conducted to develop a preservation technique that would permit adding this compound to EPA Method 525.2.
Disulfoton	298–04–4	In development	Disulfoton is listed as a contaminant in several EPA and voluntary consensus standard organization methods but it is subject to rapid aqueous degradation. Preservation research currently being conducted to develop a preservation technique that would permit adding this compound to EPA Method 525.2.
Diuron	330–54–1	In development	While this compound is included in the scope of NPS Method 4 (LLE/HLPC/UV) and EPA Method 553 (SPE/HPLC/MS), these methods are not adequate for this monitoring. EPA anticipates that this compound can be included in a new SPE/HPLC/UV method currently being developed.
Fonofos	944–22–9	In development	Fonofos is listed as a contaminant in several EPA and voluntary consensus standard organization methods but it is subject to rapid aqueous degradation. Preservation research is currently being conducted to develop a preservation technique that would permit adding this compound to EPA Method 525.2.
Linuron	330–55–2	In development	While this compound is included in the scope of NPS Method 4 (LLE/HLPC/UV) and EPA Method 553 (SPE/HPLC/MS), these methods are not adequate for this monitoring. EPA anticipates that this compound can be included in a new SPE/HPLC/UV method currently being developed.
Polonium-210 (^{210}Po)	13981–52–7	In development	Radiochemistry laboratory capacity is limited.

TABLE 1.—STATUS OF ANALYTICAL METHODS FOR CHEMICAL CONTAMINANTS ON THE UCMR (1999) LIST—Continued

	CAS No.	Analytical methods	Status of availability
Prometon	1610–18–0	In development	Prometon is listed as a contaminant in several EPA and voluntary consensus standard organization methods but it is subject to rapid aqueous degradation in non-acidified samples and is not readily extracted in acidified samples. Preservation research is currently being conducted to add neutralizing the pH of acidified samples just prior to extraction. This would permit adding this compound to EPA Method 525.2.
RDX	121–82–4	In development	No EPA or consensus methods organization analytical methods for the analysis of RDX in water are currently available.
Terbufos	13071–79–9	In development	Terbufos is listed as a contaminant in several EPA and voluntary consensus standard organization methods but it is subject to rapid aqueous degradation. Preservation research is currently being conducted to develop a preservation technique that would permit adding this compound to EPA Method 525.2.
UCMR (1999) List 3—Chemical Contaminant			
Lead-210 (^{210}Pb)	14255–04–0	In development	Method is time-consuming and expensive. Radiochemistry laboratory capacity is limited.

(ii) Microbiological Analytical Methods

The discussion of data quality for chemical analytical methods also applies to microbiological testing when analytical methods are developed for CCL microorganisms. When microorganisms were proposed for the CCL, EPA recognized that analytical methods were not well developed for the majority of them. Because of the lack of available analytical methods, some of the CCL microorganisms were grouped either into one category where information was available about methodologies indicating a need to further refine them, or another category where more research, including research on detection methods and occurrence, was needed. At the present time, and based on technical peer review and public comment, *Aeromonas* is the only one of the microorganisms for which more occurrence data are needed that also has an analytical method likely to be sufficiently developed for monitoring in time for implementation of the Screening Surveys. Three other microorganisms have methods available, but are in need of further methods development. These microorganisms (Cyanobacteria, Echoviruses, and Coxsackieviruses) may be candidates for the Screening Surveys if methods development proceeds expeditiously (§ 141.40(a)(3), Table 1, List 2), but are currently identified for Pre-Screen Testing (Table 1, List 3). The remaining four microorganisms currently lack satisfactory methods and will be evaluated for Pre-Screen Testing.

Several microorganisms on the CCL are actually groups of microorganism taxa. In some cases, the taxa have so many members that, given the limited resources available for UCMR monitoring, EPA may have to prioritize which strains, species, or serotypes are the most important to consider and target those for monitoring or further study. Decisions will have to be made on the basis of health risk, disinfection resistance, occurrence in water, and other factors. To address the need to prioritize which microorganisms should be targeted for monitoring, EPA's Office of Research and Development is assisting the Office of Ground Water and Drinking Water in establishing a research program for health effects, treatment, and analytical methods.

TABLE 2.—STATUS OF ANALYTICAL METHODS FOR MICROBIOLOGICAL CONTAMINANTS ON THE UCMR (1999) LIST

	Availability of analytical method	Status of availability
List 2—Microbiological Contaminant		
Aeromonas	Analytical method likely to be available for monitoring.	Current modification and evaluation of a published membrane filtration method (Havelaar et al., 1987) indicates that this method will be suitable for the monitoring program.
List 3—Microbiological Contaminant		
Cyanobacteria (blue-green algae, other freshwater algae and their toxins).	Methods available but not standardized.	Methods are available for counting cyanobacteria but new, standardized methods are needed for direct counts of targeted species with filtration methods or a counting chamber. Standardized analytical methods are also needed to detect the more important cyanobacterial toxins.
Echoviruses	Methods available but not standardized.	Echoviruses can be cultured on BGM cells and detected by the ICR method but require supplemental methods such as serological typing to distinguish echoviruses from other viruses. Cost of cell culture assays plus serotyping can be high. RT/PCR methods are subject to interferences and do not demonstrate infectivity. Combined cell culture and PCR, which demonstrates infectivity, may be considered.

TABLE 2.—STATUS OF ANALYTICAL METHODS FOR MICROBIOLOGICAL CONTAMINANTS ON THE UCMR (1999) LIST—Continued

	Availability of analytical method	Status of availability
Coxsackieviruses	Methods available but not standardized.	Group B coxsackieviruses are easy to grow in tissue culture but group A coxsackievirus detection in cell culture is variable. Culturable coxsackieviruses can be detected with the ICR method but serological typing is needed to distinguish coxsackieviruses from other viruses. RT/PCR methods are subject to interferences and do not demonstrate infectivity. New, standardized methods are needed. Combined cell culture and PCR methods may be considered.
Helicobacter pylori	No suitable method currently available.	*Helicobacter pylori* is difficult to cultivate because of its slow growth rate and the need for a low oxygen environment. No selective medium exists that will discriminate H. pylori from background bacteria. A culture-based method that demonstrates viability is preferred. Methods are needed for selective growth and identification. IMS has been used to concentrate *Helicobacter pylori*. Methods using PCR alone have been used but have not been validated by EPA. In general, PCR methods are not preferred due to interferences and their inability to demonstrate viability. A combined cultural and molecular method may be considered.
Microsporidia	No suitable method currently available.	No methods are available for the monitoring of the two species of human microsporidia which may have a waterborne route of transmission [*Enterocytozoon bienuesi* and *Encephalitozoon* (formerly *Septata*) *intestinalis*]. Spores could possibly be detected by methods similar to those being developed for *Cryptosporidium parvum*. Potential methods may utilize water filtration, clean-up with IMS, and detection using microscopy with either fluorescent antibody or gene probe procedures. Provided that procedures are validated by EPA, reverse-transcriptase (RT)—PCR techniques may be considered for monitoring, although PCR methods in general are not preferred at this time due to interferences and their inability to demonstrate viability. Due to the small size of microsporidia, problems could be encountered during filtration.
Adenoviruses	No suitable method currently available.	Adenoviruses serotypes 1 to 39 and 42 to 47 can be grown in tissue culture but enteric adenoviruses 40 to 41 are difficult to grow. Several selective tissue culture methods and detection methods have been reported. A selective, standardized method is needed for monitoring. PCR methods are not preferred, as they are subject to interferences and do not demonstrate infectivity. A combined cell culture and PCR method may be considered.
Caliciviruses	No suitable method currently available.	No tissue culture methods exist for the two genogroups of caliciviruses on the CCL (the Norwalk-like and the Snow Mountain-like agents). No sensitive or fully developed detection methods exist. PCR methods are not preferred, as they are subject to interferences and do not demonstrate infectivity. A combined cell culture and PCR method may be considered if a suitable cell line is found.

2. List of Contaminants To Be Monitored

(a) Final UCMR (1999) List

Section 141.40 (a)(3) Table 1, Unregulated Contaminant Monitoring Regulation (1999) List, presents EPA's list of unregulated contaminants for monitoring under Section 1445(a)(2)(B)(i) of the 1996 Amendments for the first five-year listing cycle. The monitoring program for these contaminants is a three-tiered approach based on the availability of information about each contaminant and the availability of analytical methods for each contaminant. This approach is described in Section C., Type of Monitoring Required of Public Water Systems Based on Listing Group. The final monitoring program divides the listed unregulated contaminants into three lists: List 1, for which Assessment Monitoring will be required, List 2, designated for the Screening Surveys; and List 3, designated for Pre-Screen Testing. Today's final regulation only requires Assessment Monitoring for UCMR (1999) List 1 contaminants beginning on January 1, 2001, with the exceptions of perchlorate and acetochlor, for which analytical methods have not yet been approved (but are planned to have monitoring begin on that date, also, after rulemaking to specify their analytical methods). The monitoring for contaminants on Lists 2 and 3 will only be required after EPA promulgates further rules.

Technical peer review and public comments strongly supported the three-tier approach of the UCMR program. As a result, EPA requires in today's action Assessment Monitoring for the contaminants on UCMR (1999) List 1, because analytical methods for these contaminants currently exist or will shortly be validated. EPA will shortly publish a request for public comment on a revision to this final rule to implement the analytical methods and other sampling requirements for perchlorate and acetochlor. Also, by future rulemaking, EPA plans to implement the Screening Survey (List 2) monitoring in groups of contaminants, rather than one contaminant at a time, to minimize sampling and testing costs since some of the contaminants may be tested by the

same method. EPA intends to take a similar approach with the contaminants on List 3, the Pre-Screen Testing. EPA plans to require, through future rulemaking, Pre-Screen Testing for contaminants for which EPA determines that new analytical methods can measure their existence in locations where they are most likely to be found. All analytical methods for contaminants on Lists 2 and 3 would be peer reviewed, following EPA's policy for peer review, before the Agency proposes regulations which would require public water systems to monitor for them.

In § 141.40 (a)(3), Table 1, UCMR (1999) List 1 contaminants, for Assessment Monitoring, are chemical contaminants for which analytical methods capable of generating the quantity and quality of data required under the UCMR are currently available, or expected to be available shortly after today's final rule. Monitoring for these contaminants is required under today's final UCMR, with the exceptions of perchlorate and acetochlor, as noted.

UCMR (1999) List 2 contaminants (14 organic chemicals, one radiochemical and one microorganism), for the Screening Surveys, are those for which EPA is currently refining analytical methods. Development of these methods should be sufficient for Screening Surveys to be conducted in the first three years of the listing cycle, but may occur in the later years of the cycle. These contaminants are characterized in today's final rule at § 141.40(a)(3), Table 1, Unregulated Contaminant Monitoring Regulation (1999) List, List 2.

UCMR (1999) List 3 contaminants (seven microbiological contaminants or contaminant groups and one inorganic chemical), for Pre-Screen Testing, are those for which EPA has begun or shortly will begin analytical methods development, but completion of those efforts is not expected prior to the Assessment Monitoring required under implementation of this regulation. Instead, these contaminants will be tested for in Pre-Screen Testing. These contaminants are listed in today's final rule at § 141.40(a)(3) as Table 1, Unregulated Contaminant Monitoring List, List 3.

Tables 3 and 4, in IV.A.1.(c), Analytical Methods Applicable to the UCMR (1999) List, present a summary of the status of the methods for all the contaminants on this list.

EPA believes that this three-tiered approach to the UCMR, which was recommended by stakeholders, reflects a balance between the implementability of current analytical methods and the need to obtain data in time frames that are useful for responding to concerns about the contaminants identified.

(b) Number of Contaminants on the UCMR (1999) List

Thirty-six contaminants are on today's final UCMR (1999) List. SDWA Section 1445 (a)(2)(B)(i) states that in August 1999 and every five years thereafter "the Administrator shall issue a list of * * * not more than 30 unregulated contaminants to be monitored by public water systems and to be included in the national drinking water occurrence data base * * *" EPA interprets this to mean that the UCMR list may contain more than 30 contaminants, as long as monitoring is not required for more than 30 contaminants during a five-year listing cycle. Public comments were split on whether the monitoring list should have more than 30 contaminants. EPA believes that maintaining a monitoring list with more than 30 contaminants, while requiring monitoring for no more than 30, is responsive to public concerns about contaminants in drinking water. This interpretation and approach also supports EPA's efforts to respond to and encourage analytical methods development for emerging contaminants.

Any PWS may voluntarily submit data to EPA, including data for contaminants that a PWS may monitor that are on the UCMR (1999) List of 36 contaminants, but that are not on the final list of 30 contaminants actually required for UCMR monitoring. EPA is preparing a guidance document specifying the procedures for future voluntary submission of such data to the National Drinking Water Contaminant Occurrence Database (NCOD).

B. Public Water Systems Subject to the UCMR

The monitoring in this final rule focuses ultimately on determination of, on a national basis, the occurrence or likely occurrence of contaminants in drinking water delivered by community water systems (CWS) and non-transient non-community water systems (NTNCWS). For regulatory purposes, public water systems are categorized as "community water systems," or "non-community water systems." Community water systems (CWSs) are specifically defined as "public water systems which serve at least 15 service connections used by year-round residents or regularly serve at least 25 year-round residents." (40 CFR 141.2) A "non-community water system" means any other public water system. Non-community water systems include nontranisent non-community water systems (NTNCWSs) and transient non-community water systems. Non-community water systems are available to serve the public, but are not used on a year-round basis in most cases. Non-transient systems regularly serve at least 25 of the same persons over six months per year (e.g., schools). Transient systems do not regularly serve at least 25 of the same persons over six months per year. Additionally, some community water systems purchase all or part of their water supply from other water systems. Purchased water systems may be at the end of a distribution system from the water system selling the water.

One of the factors considered in establishing the UCMR program is the number of persons served by a system. With respect to size, about 2,774 large systems (each serving more than 10,000 persons) provide drinking water to about 80 percent of the U.S. population served by public water systems. Under today's final regulation, all large systems will be required to monitor the unregulated contaminants specified in § 141.40(a)(3), List 1 of Table 1, UCMR (1999) List, with the exception of perchlorate and acetochlor for which analytical methods have not been promulgated. In response to public comment on purchased water systems representing the end of a distribution system, purchased water systems are also included in this monitoring requirement for microbiological contaminants that occur primarily in distribution systems with maximum residence times or low disinfectant residuals which may allow microorganisms that have human health effects to survive and reproduce.

Section 1445(a)(2)(A) requires that the UCMR ensure that only a representative sample of systems serving 10,000 or fewer persons (small systems) monitor for unregulated contaminants. Small community water systems and small non-transient, non-community water systems total 65,636 systems. From this total number of small systems, EPA will select a national representative sample of 800 small systems. EPA is excluding transient non-community systems from UCMR requirements. The variation in the 97,000 transient systems would be difficult to reflect in a national representative sample and would be very costly to monitor. Furthermore, projecting contaminant exposure results from such systems would be complex and inconclusive because of the transient nature of the population that uses them. The results from the very small community and non-transient non-community systems (NTNCWS) can be extrapolated to the transient non-community systems. Public comments

supported not including these systems in the representative sample. One commenter suggested that transient systems be the subject of a special survey since they may be a pathway of exposure for a specific segment of the population. At this time, EPA is not planning any special surveys of transient systems because they are such a large and diffuse category and it is difficult to compile and evaluate population exposure information for this category of water systems.

EPA will pay for the reasonable costs of monitoring by the small systems selected for the representative sample, as long as the systems are part of a State Monitoring Plan. The EPA will select systems to monitor through the use of a random number generator according to a national representative sample selection plan developed primarily on the basis of population served by PWSs in each State. This detailed selection plan is necessary to ensure that the sample is statistically valid and representative of all small water systems nationally. This plan is also necessary because EPA typically has the least information about these systems and needs a consistent base of data for regulation development. EPA will use a national sample of approximately 800 systems serving 10,000 or fewer persons which the EPA will statistically draw from all small CWSs and NTNCWSs nationally. Section F, "Representative Sample of Systems Serving 10,000 or Fewer Persons," provides the details of the sample selection plan, including the sample size. The number of systems selected within each size category of systems will be based on the proportion of population served by that size category. System selection will be further allocated across water source type and distributed across all states.

The State-based component of this national representative sample, called a State Monitoring Plan (or State Plan), will include the list of systems statistically selected for UCMR monitoring. Other state responsibilities will be defined in the Memorandum of Agreement issued between the States and EPA. The State can review, and modify if necessary, the list of systems in the State Plan. The resulting State Plans will then be part of a national sample framework, providing the representative national sample requisite to drawing national conclusions for contaminant exposure.

To provide a more capable understanding of contaminants and conditions affecting small systems, and to provide additional quality assurance, EPA will randomly select up to 30 small public water systems from the systems in State Monitoring Plans as "Index" systems. Index systems must monitor every year during the five year UCMR listing cycle. These systems will also be required to report information on system operating conditions (such as water source, pumping rates, and environmental setting). This information will assist EPA in more fully evaluating small system operations and future regulations of small systems. EPA will conduct the sampling and testing for Index systems. At the time of sampling, EPA will also gather other 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).

Also, up to 150 additional small systems might be selected for the Pre-Screen Testing. The systems for the Pre-Screen Testing will be selected on the basis of their representativeness of systems most vulnerable to the particular UCMR (1999) List 3 contaminants for which methods have been refined. The statistical selection of the 800 systems for the national representative sample may not include the systems determined to be most vulnerable to these contaminants, hence; the States and EPA may need to select additional systems for this targeted testing.

External expert peer review and public comments supported the statistical approach described to select small systems for the national representative sample and State Monitoring Plans.

C. Type of Monitoring Required of Public Water Systems Based on Listing Group

At the UCMR Stakeholders Meeting on June 3–4, 1998, a diverse group of stakeholders suggested that the UCMR Program be developed through a progression of monitoring levels based on contaminant group characteristics. These characteristics reflect current information about both the occurrence of and method availability for the contaminants. Occurrence information and methods availability will determine which phase, or tier, of monitoring the contaminants will be placed. Both EPA and stakeholders are also concerned about contaminants that may be "emerging" as contaminants of concern. These emerging contaminants have not been monitored before, but have the potential to be found near or in drinking water supplies or recently have been identified as potential health problems. It is not likely that there exists approved EPA analytical methods for the "emerging contaminants of concern". Typically, "research" analytical methods are used to detect such emerging contaminants and may be expensive. EPA will have to either develop an approved method for inclusion in a regulatory approach, or perhaps substitute a regulatory approach with a study using a single laboratory and a "research" analytical method. The resources needed to develop an approved analytical method will face competing resource demands for other contaminants on the CCL that also require analytical method development. In recognition of these considerations, as described above, the final rule incorporates an approach with three monitoring levels, or tiers, referred to as "Assessment Monitoring," "Screening Survey," and "Pre-Screen Testing".

1. Assessment Monitoring

The first type of monitoring in the three-tiered monitoring program of today's rule pertains to the group of contaminants for which analytical methods are currently available and are specified in § 141.40(a)(3), Table 1, UCMR (1999) List 1, Assessment Monitoring Importantly, these contaminants are ones for which initial data for PWSs indicate that the contaminants occur in at least two States or ten public water systems and should be monitored to assess national occurrence through the UCMR. Based on today's rule, all contaminants in § 141.40(a)(3), Table 1, List 1 must be monitored in the Assessment Monitoring tier of the UCMR Program, except perchlorate and acetochlor, for which analytical methods are soon to be finalized.

In § 141.40, EPA indicates that each system must conduct UCMR "Assessment Monitoring" of List 1 contaminants for a twelve-month period in the first three years (i.e., 2001 through 2003) of a five-year UCMR contaminant listing cycle (i.e., 2001 through 2005). Large systems must complete this monitoring in any twelve-month period within the years 2001 to 2003. Small systems in State Monitoring Plans must complete the monitoring according to the scheduled monitoring identified in those plans within the period of 2001 to 2003. Section F, "Representative Sample of Systems Serving 10,000 or fewer persons," describes in detail the selection of the subset of small systems required to monitor. The State could specify in the State Monitoring Plans a schedule that would correlate with compliance monitoring. This arrangement should enable systems to complete UCMR

sampling coincident with their compliance monitoring for regulated contaminants during one of the years when compliance monitoring is required. However, EPA recognizes that some large systems may not be required to monitor for any regulated contaminants during the five-year UCMR listing cycle. In that case, such large systems could monitor for the unregulated contaminants during any twelve-month period within the three years they choose. This approach, as originally proposed, is responsive to public comments that UCMR monitoring be able to be conducted in conjunction with compliance monitoring.

EPA is requiring that surface water systems monitor for four consecutive quarters in the designated, or, in the case of large systems, selected, monitoring year, and that ground water systems monitor two times approximately five to seven months apart in their monitoring year. Under Assessment Monitoring, systems serving more than 10,000 persons must conduct and pay for their own sample collection and testing. Small systems included in State Monitoring Plans must collect the samples with EPA-supplied equipment and send the samples to EPA-specified laboratories. EPA will pay for the testing and reporting. Although the laboratory may report the information directly to EPA and provide a copy to the State, the system still has final reporting responsibility to ensure that results are reported to EPA and copied to the State. Frequency and location of monitoring are discussed in section D, "Monitoring Requirements under the Final UCMR."

2. Screening Surveys

The contaminants that EPA is considering for the Screening Survey are listed in § 141.40(a)(3), Table 1, List 2. These contaminants are those for which analytical methods are under development and for which EPA has less occurrence data than for the contaminants on List 1. The purpose of the Screening Survey is to analyze for contaminants where the use of newly developed, non-routine analytical methods are required. To do this and still maintain adequate quality of the occurrence data, EPA will use only a select, controlled group of laboratories. In addition, the Screening Survey approach might allow EPA to maximize scientifically-defensible occurrence data for emerging contaminants of concern more quickly than could be obtained through a more standard unregulated contaminant monitoring effort. The Screening Survey could, for example, be useful where questions concerning whether a contaminant of concern is in fact occurring in drinking water and the range of concentration of that occurrence. The Screening Survey is also intended to allow EPA to screen contaminants to see if they occur at high frequencies or concentrations that justify inclusion in future unregulated contaminant Assessment Monitoring or at sufficiently low frequencies that do not require further monitoring, but allow the Agency to evaluate standard development.

The contaminants in UCMR (1999) List 2 will be monitored by a smaller, statistically selected sample from all (large and small) community and non-transient non-community water systems (about 300 systems total). These systems will be selected through a random number generator. Systems will not have to initiate Screening Surveys until after EPA promulgates requirements for Screening Surveys. The sample size needed for estimating frequencies of contaminant occurrence are smaller if the actual occurrence frequencies are close to 0 or to 100 percent. When a contaminant is consistently present or consistently absent it requires fewer samples to determine its frequency with adequate statistical confidence than if it occurs about half the time. Only 300 PWSs are needed to determine if a contaminant is present 5 percent of the time or less frequently, at a 99 percent confidence level and with a 3 percent margin of error. (The same criteria require 1,844 samples when the frequency could be any number.) If the contaminant occurrence findings are above the thresholds established for the Screening Survey, EPA will include the contaminant in the next Assessment Monitoring round (projected to begin in 2006) of the UCMR Program. The statistical threshold for positive results from this monitoring to determine if further monitoring is warranted might be 1 to 2 percent of systems with detections. If the contaminant occurrence were under the threshold, then no further testing would be required, and the contaminant may be removed from the list in a future UCM rulemaking. EPA requested public comment on whether the statistical threshold of 1 to 2 percent of systems is adequate to make a determination that further Assessment Monitoring should be conducted to determine the extent of contaminant occurrence, and, if not, what percent should be used as the threshold for such a determination. One commenter suggested that EPA should use a threshold of 3 to 5 percent, but did not provide any rationale. EPA believes that 1 to 2 percent is consistent with the approach that this monitoring is a Screening Survey to determine whether the contaminant(s) are occurring in any public water system. One to 2 percent occurrence is equal to 3 to 6 systems for the sample, but statistically this can be extrapolated to 600 to 1,200 systems out of all small systems that may have an occurrence of the contaminants. For a sample size of 300, occurrence of a contaminant on the monitoring list in any system would indicate that the contaminant occurs at a frequency greater than 0 (zero). Therefore, EPA should give further consideration to the occurrence and concentration of such a contaminant and may evaluate the extent of its occurrence nationally. EPA considers this extent of occurrence to be significant and to warrant more extensive monitoring, perhaps even through Assessment Monitoring. Another commenter indicated that EPA should evaluate other factors and not just the extent of occurrence before deciding to regulate a contaminant. EPA agrees with this comment and will continue to evaluate other factors.

The anticipated analytical methods that might be used for Screening Surveys are identified in § 141.40(a)(3), Table 1, List 2, as "Analytical Methods." These methods are being refined for the particular contaminants on List 2 and are not expected to be ready for use in an Assessment Monitoring program. Therefore, as analytical methods are developed for groups of contaminants on List 2, EPA will propose a rule modification for public comment and will promulgate analytical methods, minimum reporting levels and the location and timeframe for sampling for each contaminant.

Additionally, EPA requested public comment on two potential outcomes from the Screening Survey: (1) if the contaminant is observed at very few or no PWSs (i.e., less than the threshold of 1 to 2 percent of systems), then the contaminant may be dropped from the UCMR (1999) List 2 and no further monitoring for it will occur; and, (2) if the contaminant is observed extensively (i.e., in a higher percentage of PWSs, such as 5 to 10 percent) and EPA has health effects data for the contaminant that indicate a significant concern, then that specific contaminant may move directly to the regulation development stage. In these cases, there may be no Assessment Monitoring tier of monitoring activity to provide additional occurrence data for that contaminant. One commenter expressed concern that EPA would move directly to regulation development after obtaining results from Screening Surveys for a contaminant and stated

that EPA should move the contaminant up to Assessment Monitoring before taking any action. EPA believes that an occurrence of a contaminant in 5 or 10 percent of systems, for example, in the screening survey may be sufficient to determine whether or not to initiate regulation development. EPA may decide that it needs more information, in which case, EPA could move the contaminant to Assessment Monitoring (List 1) for more extensive monitoring to inform the regulatory process, but this may not always be necessary.

With respect to funding the Screening Survey, EPA will pay for the testing and reporting (as described in Preamble section V.G., Reporting of Monitoring Results) for systems serving 10,000 or fewer persons. Systems serving 10,000 or fewer persons will be responsible for sample collection and preparing the samples for shipment. EPA will pay for the shipment of these samples to an EPA-designated laboratory for testing and for reporting of monitoring results to EPA, with a copy to the State.

For large systems serving more than 10,000 persons, EPA requested public comment on whether it should set performance standards and allow systems to conduct their own laboratory analyses in compliance with the standards, or should approve a limited but sufficient number of laboratories to do lab analyses for large systems, providing for quality control across a manageable number of laboratories while allowing competitive pricing of services. Most commenters, including water system operators, favored EPA approval of a limited number of laboratories, but noted that a sufficient number of laboratories were needed so that competitive pricing would be available.

EPA expects the Screening Surveys will occur one or two times during the five-year listing cycle of 2001 through 2005. EPA expects that this Screening Survey monitoring will occur for groups of contaminants, rather than for one contaminant at a time, depending on when the different methods are promulgated and the timing of their promulgation. Systems selected for the Screening Surveys will monitor at the same frequency as for contaminants under Assessment Monitoring. Should approval and implementation of the analytical method for a particular contaminant become delayed, the contaminant might be moved into the category of Pre-Screen Testing, described next.

3. Pre-Screen Testing

The third tier of the final monitoring program is "Pre-Screen Testing", which will be conducted for contaminants with analytical methods that are in an early stage of development and at systems that are determined to be most vulnerable to the occurrence of contaminants on the Pre-Screen Testing list. Pre-Screen Testing means sampling, testing, and reporting of the listed contaminants that 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 performed to determine whether a listed contaminant occurs in sufficient frequency in the most vulnerable systems or sampling locations to warrant its being included in future Assessment Monitoring or Screening Surveys. Pre-Screen Testing will only be required after additional rulemaking.

EPA will select a limited number of systems (up to 200) to conduct Pre-Screen Testing, possibly using a random number generator, selected from up to 25 of the most vulnerable systems identified by each State, or by EPA if a State decides not to participate in the Pre-Screen Testing system selection process. Up to 200 systems, a smaller sample size than under the Screening Survey or Assessment Monitoring, are considered sufficient for this type of monitoring because monitoring will occur at systems determined to be vulnerable to occurrence of the contaminants, based on the characteristics of the contaminants, system operation, climatic conditions, and land and water resource use. This monitoring is to determine whether the contaminant can be found in any public water system under most likely occurrence conditions specific to the contaminant. This tier of monitoring is not designed to determine the extent of occurrence. A portion (e.g., 100 to 150) of these 200 systems may be a different subset of small systems serving 10,000 or fewer persons than those selected for the national representative sample. The reason for this different subset is that States should identify the systems that are representative of the most vulnerable conditions for the contaminants specified for Pre-Screen Testing. These most vulnerable systems may not be those conducting Assessment Monitoring or the Screening Survey. It is possible, though, that some overlap of systems doing Assessment Monitoring and those selected for Pre-Screen Testing could occur.

Under Pre-Screen Testing, EPA will designate or approve a laboratory or laboratories to conduct sample analysis. The reason for this testing approach is that the analytical methods expected to be used will be emerging from research development, and most laboratories will not have any experience with them. For these laboratories to utilize the new methods could involve extensive investment in equipment and training. Rather than requiring this investment for contaminants which have uncertain occurrence in public water systems, EPA will develop and promulgate appropriate methods. EPA will also require that these methods be used by designated or approved laboratories. Pre-Screen Testing analysis is conducted at systems most likely to have the contaminants to determine whether further action is warranted and additional method development is needed.

Under this approach, once EPA has developed methods and promulgated the rule to test for List 3 contaminants, it will request States to identify at least 5 and not more than 25 systems (based on the population served by PWSs in each State) most vulnerable to the listed contaminants. States will select these systems from all community and non-transient non-community systems of all sizes. Selection criteria for these systems include States' determination of systems most vulnerable to the specified contaminants and numbers of systems per State based on the population served in each size category of system. The States will send the list of systems, any modification of their State Monitoring Plans, and the reasons for their list and modifications (considering the characteristics of the contaminants, precipitation, system operation, and environmental conditions) to the EPA. EPA will select up to 200 PWSs nationwide, from the pool of State-identified vulnerable systems, that must submit samples of the specified contaminants. Some small systems selected may not be part of the national representative sample of 800 small systems selected for Assessment Monitoring. Hence, some small systems may only be required to sample for Pre-Screen Testing. States or EPA will provide instructions to the systems for the necessary sampling and subsequent shipping to the EPA laboratory. At this time, EPA believes that the contaminants for which Pre-Screen Testing will likely be required are those listed in the final rule at § 141.40(a)(3) Table 1, List 3. Sampling and testing done for Pre-Screen Testing will most likely be required in the later years of the five-year UCMR listing cycle. This approach will assist EPA in refining the methods for these contaminants. If EPA finds any substantial frequency of occurrence of Pre-Screen Testing contaminants, the contaminants could

become part of either the Screening Survey or part of Assessment Monitoring in future UCMR lists. Since the methods for these contaminants will have to be applied under highly controlled analytical conditions, EPA will pay for the shipping and analyses of these samples for small systems selected to participate. Large systems will pay for the shipping and testing of samples at EPA approved laboratories.

Public comments requested that EPA provide guidance on the selection of "most vulnerable" systems and on reporting requirements for Pre-Screen Testing. EPA plans to provide this guidance during the years 2001 and 2002, and obtain public comment before the guidance is final.

D. Monitoring Requirements Under the Final UCMR

1. Monitoring Frequency

(a) Systems Serving More Than 10,000 Persons

(i) Chemical Contaminants.

The number of persons served affects exposure to contaminants and resources necessary to monitor. The final UCMR program requires large systems serving more than 10,000 persons to monitor at each entry point to the distribution system, or other representative compliance monitoring location specified by the State, whether or not the system applies treatment. If a system applies treatment, then it must monitor after treatment. In response to public comment, EPA modified the rule to allow alternative sampling points to be used: sampling points identified by the State for compliance monitoring under 40 CFR 141.24(f)(1), (2), and (3), and/or source (raw) water sampling points, if the State uses source water monitoring as a more stringent monitoring requirement. If monitoring at source (raw) water sampling points indicates detection of any of the contaminants on the monitoring list, then the system in most cases will be required to shift its unregulated contaminant monitoring to the entry point to the distribution system. These flexibilities in the sampling location should enable systems and States to coordinate compliance and unregulated contaminant monitoring more extensively.

The law requires EPA to consider the source of water relative to unregulated contaminant monitoring requirements (SDWA Section 1445(a)(2)(A)). Over the twelve-month period of monitoring, the regulation requires that systems sample from all entry points to the distribution system, or other sampling points specified, representing all principal, non-emergency sources of water used over the monitoring period. Surface water-supplied systems will monitor each of these points every three months for a twelve-month period and ground water-supplied systems will monitor each of these points two times five to seven months apart within a twelve-month period. Today's final monitoring frequency for surface water systems is the same as in the previous program. For ground water systems, the two sampling events must be approximately six months apart, increasing the frequency from one sample in five years under the previous program to two. The reasons for this increase are that while ground water typically moves slowly, one sample is insufficient to characterize water quality at any particular location and will not provide evidence of any changes over a longer period of time. Furthermore, some ground water environments transmit water more rapidly, potentially resulting in changes in water quality over shorter timeframes. From a statistical standpoint, one sample is not representative and will not allow the data to be used for exposure assessment which uses an average annual value. This frequency applied to the average of 6.2 entry points to the distribution system for systems serving more than 10,000 persons will provide sufficient data for an adequate statistical analysis of the varied conditions in which these systems are located.

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 rationale for this approach is that it provides data representing potential variation in contaminant concentration over the course of a year. This potential variation in concentration is necessary to evaluate exposure related to contaminant occurrence. Some systems perform compliance monitoring on a quarterly basis and can collect UCMR samples coincident with their compliance samples, and therefore provide data on the range of variation. Other systems may only conduct compliance monitoring once every third year and will therefore have to collect additional samples under the UCMR. While one UCMR sample could be collected coincident with this compliance sample, EPA is requiring for ground water-supplied systems to take a second sample five to seven months later. This requirement will provide the necessary data on seasonal variation over a year to allow consistent exposure assessments to be done with a range of concentrations. Stakeholders supported this option. EPA originally proposed that the second sample be collected exactly six months later. State commenters indicated a need to provide flexibility to accommodate changes in monitoring schedules. Therefore, EPA modified the regulation to allow monitoring five to seven months before or after the initial vulnerable period sampling event.

(ii) Microbiological Contaminants

For microbiological contaminants, the sampling frequency will be two times within one year, with samples collected each time at two different locations after treatment in the distribution system: a site representative of water in the distribution system received by the general population that the system serves and a site in the distribution system representing the maximum residence time or lowest disinfectant residual, depending on the contaminant. The frequency should capture the most vulnerable time as well as a time five to seven months later to provide an average exposure. Furthermore, precipitation patterns may be a major factor in contaminant occurrence. Thus, frequency of sampling should be tailored to the most vulnerable times because increased seasonal precipitation may carry these contaminants at higher concentrations than other times during the year.

(b) Systems Serving 10,000 or Fewer Persons

The final rule states that approximately one third of the small systems (serving 10,000 or fewer persons) selected through the representative sample, be sampled each year over a three-year period at the frequencies indicated in Section D, "Monitoring Requirements Under the Final UCMR" (1)(a) above. This allows a relatively even submission of samples to be managed and tested by the EPA laboratory. EPA will pay for the reasonable costs of monitoring (i.e., containers, shipping, testing and reporting) for this representative sample of systems, including Assessment Monitoring, Screening Survey, and Pre-Screen Testing, and will conduct the analyses at its designated laboratories. EPA, therefore will need to be able to manage the number of samples being received at any time to closely correspond to the analytical capacity of its laboratories. Some public commenters suggested that sampling for microbiological contaminants not occur at the maximum residence time in the distribution system, but at the point of lowest disinfectant residual, since the

monitoring of concern is for effectiveness of treatment and booster disinfection stations that may be in use in long distribution lines. In response, EPA added another sampling point at the "lowest disinfectant residual" in the distribution system. However, EPA maintained the original sampling point location of "maximum residence time" because, given potential chemical degradation over long periods of time in a distribution system, such as for disinfection byproducts, the location of maximum residence time can often be the location of lowest disinfectant residual and, therefore, highest likelihood of microbiological contaminants.

Public comments also addressed the flexibility in monitoring schedules to allow for unforeseen events or factors in field sampling. Specifically, States asked that system sampling schedules allow for sampling over a month within a quarter, rather than exactly three months later. EPA modified the final rule to allow sampling by small and large surface water systems to occur within the same month in each quarter and for small and large ground water systems, to occur any time five to seven months before or after the initially selected month within the vulnerable time.

2. Monitoring Time for Vulnerable Period

Water quality studies and monitoring throughout the United States have clearly shown that contaminant occurrence and/or concentration vary over time, both seasonally as well as from year to year. The seasonality of occurrence, or period of peak concentration of contaminants, commonly varies with seasonal changes in the hydrologic cycle in relation to the source of contaminants and their fate and transport characteristics. Particularly for land-applied or land-disposed contaminants, the increased flux of water mobilizes the contaminants and moves them into surface or ground water flow systems. For the most vulnerable of water systems, such as surface waters, unconfined shallow ground water and karst flow systems, for example, higher levels of contaminant concentrations typically occur during annual runoff and recharge periods. For much of the United States, east of the Rocky Mountains, many studies have shown that the season of greatest vulnerability for contaminant occurrence is the late-spring, early-summer runoff-recharge period, particularly for contaminants such as pesticides and nitrate (e.g., Larson et al., 1997; Barbash and Resek, 1996; Hallberg, 1989a,b). For deeper, more confined ground water systems, defining vulnerable periods is much more difficult. The exact flow path and time of travel are much greater and more complex and are dependent upon many factors unique to a particular well and aquifer setting (e.g., Hallberg and Keeney, 1993). There is no generality that can be applied to these latter settings.

Because occurrence may vary seasonally, it is important to try to capture these vulnerable periods in a one-time survey of contaminant occurrence such as the UCMR. Statistical studies of sampling strategies in surface water (e.g., Battaglin and Hay, 1996) have shown that incorporating sampling during spring and early summer runoff periods provides a more accurate representation of annual occurrence than random quarterly sampling (that can avoid these months). Ground water studies (e.g., Pinsky et al., 1997) suggest that the more vulnerable ground water settings also show peaks during these periods. The default vulnerable period for sampling for the UCMR has been designated to coincide with this period of peak vulnerability for much of the United States: one sample must be collected during May, June, or July, unless the State has better information to designate another period. Also, for surface waters, three additional samples will be collected throughout the year, and for ground water systems, one additional sample will be collected five to seven months before or after the vulnerable time. This additional sampling will also capture the winter recharge and runoff period that may be more vulnerable in the western coastal regions or warmer southern climates for some contaminants. In the case of some deeper ground water systems, States or systems may have additional knowledge of seasonal vulnerability patterns, in which case the State can designate an alternative period for sampling.

Public comments generally supported monitoring in a vulnerable time, but desired flexibility in establishing the time and frequency. The rule already provided flexibility in selecting a time within the May to July period for a sampling event. However, because the statistical approach requires consistency, today's rule enables a State to determine the alternate vulnerable time for monitoring, rather than each system using its own criteria for choosing a vulnerable time. With respect to frequency, the statistical approach requires that systems monitor with the same frequency so that a national frequency distribution can be developed. This precludes the State or a system from establishing its own monitoring frequency.

Two commenters indicated that pumping rate and not hydrologic factors accounted for variations in contaminant concentration, with higher pumping rates coinciding with higher concentrations. No specific data were offered in support of these comments. EPA believes that many factors may account for higher contaminant concentrations during certain seasons. While pumping rate may be a factor, hydrologic factors are documented as having a significant influence in concentrations of pesticides and other contaminants, as noted previously. A State may use pumping rates as a basis for designating an alternative vulnerable time if determined appropriate.

3. Monitoring Location

In § 141.40(a)(3), today's action identifies entry points to the distribution system (EPTDS) after any treatment, or the sampling points specified by the State for compliance monitoring under 40 CFR 141.24(f)(1), (2), and (3), representative of each principal, non-emergency water source in use over the twelve-month period of Assessment Monitoring, as the sampling locations for List 1 contaminants. Also, two sites in the distribution system (a site representative of water in the distribution system received by the general population that the system serves and a site in the distribution system representing the maximum residence time or the lowest disinfectant residual) are designated for microbiological or distribution system contaminants. Sampling at entry points to the distribution system after any treatment follows the existing regulatory approach for currently regulated contaminants and provides data for exposure assessment.

(a) Chemical Contaminants

The chemicals in this final rule (UCMR (1999) List 1) are all compounds that can enter a public water supply from the external environment (in contrast to disinfection byproducts, for example). The monitoring location is at the entry point to the distribution system after treatment, representative of each principal non-emergency source of water in use over the twelve-month monitoring period, which will ensure a nationally consistent data set and will provide consistent data for exposure assessment. In response to State and water system commenters, EPA also provided flexibility in the final rule to allow sampling of source (raw) water sampling points. However, if a listed contaminant is detected through source

water sampling and testing, then the monitoring location must be shifted to the entry point to the distribution system (unless there is no treatment) and follow the monitoring frequency specified in the rule for the contaminant and water source type.

(b) Microbiological Contaminants

The sampling locations for microbiological contaminants are different from those for chemical contaminants because the most likely locations with microbiological contaminants may be in the distribution system, or, for some systems, in source water. Two sampling locations were considered in the development of this regulation and are included in the reporting requirements under 40 CFR 141.35(d). No microbiological contaminant is on List 1 for Assessment Monitoring so the two sampling points are not now required. When microbiological contaminant monitoring is required, one of the samples will be at the site below a representative entry point to the distribution system that is used for taking total coliform samples; this sample will represent general exposure. The second sample will be in the distribution system that has the maximum residence time or lowest disinfectant residual, representing the extreme exposure of the population at this point in the distribution system. These sampling points were suggested by stakeholders. EPA will consider activating these sampling points for microbiological contaminants when their analytical methods are determined to be ready for Assessment Monitoring, Screening Survey or Pre-Screen Testing through separate rulemaking. Over the twelve-month period of monitoring, systems would sample at locations representing each principal, non-emergency source of water used over the monitoring period, to the extent possible. One commenter suggested that distribution system samples be taken at sites used for sampling total trihalomethanes (TTHMs). EPA will consider TTHM sites when it proposes methods for microbiological contaminants or other contaminants likely to occur in distribution systems.

Currently, it is not possible to assess whether or not all of the microbiological contaminants (including those on List 3) are likely to be found at any one sampling location, or that one sampling location is best to potentially identify all microbiological contaminants. The occurrence data needs may differ for different contaminants. Different portions of the water supply and distribution system may be more likely locations of particular microbiological contaminants/occurrences. Therefore, the sampling location for each microbiological contaminant may need to be contaminant-specific and related to the likelihood of occurrence.

As a result, for the microbiological contaminants on Lists 2 and 3 of the rule today, EPA has not identified a sampling location or locations. For some of the microbiological contaminants, source water may be the most appropriate sampling location. EPA will specify sampling locations at the time public comment is requested on the specific monitoring requirements for microbiological contaminants.

4. Quality Control Procedures for Sampling and Testing

To assure that the data collected under this final regulation are of sufficient quality to meet the requirements of its intended uses, EPA is requiring the use of the analytical methods and procedures in § 141.40(a)(3), (4), and (5) and Appendix A for monitoring. Also, additional guidance for quality control and analytical confirmation are specified in the "UCMR Analytical Methods and Quality Control Manual", available by the time this rule is published. This final regulation covers quality control steps for all sampling and testing under this program. Today's final rule requires that all monitored systems follow these methods and procedures in organizing and conducting their UCMR sampling and testing. Systems must also ensure that the laboratories they use to analyze samples use these approved methods and procedures. The specific quality control requirements addressed in § 141.40(a)(3), (4) and (5) and Appendix A of the final rule include: sample collection/preservation; sample transport; sample and sample extract holding time and storage; sample analyses/quality control requirements, including quality control (QC) requirements, calibration, calibration verification, laboratory reagent (method) blank, quality control sample, laboratory duplicates, sample matrix spike and matrix spike duplicate, internal standard, surrogate standard, method detection limit determination, minimum reporting level; confirmation; and reporting requirements. EPA believes that specifying the quality control requirements for UCMR sampling and testing will enable the Agency to have a high degree of confidence in determining the extent and range of concentrations for the contaminants on the UCMR (1999) List, since they are not regularly tested for nationally.

5. Monitoring of Routinely Tested Water Quality Parameters

In addition to the contaminants to be monitored, several chemical and physical parameters are important indicators of water quality and may contribute to the likelihood of contaminants being found in drinking water. EPA requested public comment on whether it should require the monitoring and reporting of these routinely tested parameters, usually associated with water quality analyses, to provide for a more thorough scientific understanding of the occurrence of unregulated contaminants. These chemical and physical parameters are not added to the UCMR (1999) List because they are not contaminants, but rather they provide supplementary data about the sample results which will facilitate their interpretation and use in regulatory decisions. Public comments indicated that for some systems and States, these chemical and physical parameters are routinely tested for, and in others, they are not. One commenter stated that temperature and pH were important for chemical contaminant occurrence and degradation. Another commenter indicated that analyzing for these water quality parameters is essential to managing his system's water. In response, EPA has revised the rule to require that for organic and inorganic chemical samples, pH be reported for the sampling event of each sampling point. Since no supporting information was provided, EPA determined that while temperature may be important for microorganisms, it is not expected to affect the results for chemical contaminants because the storage and transit temperature requirements in the approved methods will minimize the loss of target contaminants due to any physical, chemical or biological processes. For microbiological contaminants, temperature, pH, free disinfectant residual, and total disinfectant residual must be reported. These required water quality parameters are listed in § 141.40 (a)(4)(i) Table 2, Water Quality Parameters To Be Monitored With UCMR Contaminants. These water quality parameters must be reported as analytical results along with other results and data elements.

6. Relation to Compliance Monitoring Requirements

Currently, compliance monitoring for regulated contaminants is coordinated on a three-year cycle. All public water systems that are required to monitor for specific contaminants a minimum of one year out of every three, six, or nine

years, depending on the contaminant and its occurrence in the system. The existing unregulated contaminant monitoring requirements and the final revised UCMR require monitoring during one year out of every five years. EPA provides flexibility in this final UCMR so that public water systems: (a) only have to monitor for unregulated contaminants during one twelve-month period every five years (unless the State, at its discretion, determines that PWSs should conduct more frequent monitoring); (b) can use previously State-specified compliance sampling points, including source water sampling points; and (c) choose a sampling time within quarters or three-month periods specified in the rule. Hence, the compliance monitoring and the UCMR monitoring can be coordinated, to the extent practical, by conducting UCMR monitoring during a coincident year during which compliance monitoring is required. The years within which the unregulated contaminant monitoring are required to occur are specified in § 141.40(a)(3), Table 1, Unregulated Contaminant Monitoring List, column 6.

7. Previous Monitoring of the Contaminants on the Final UCMR (1999) List

Some PWSs may already have monitored for or want to monitor before the rule's effective date of January 1, 2001, for some of the contaminants identified on the final UCMR (1999) List because of local or State concerns about the possibility of those contaminants occurring in drinking water. At the time of proposal, EPA was concerned about allowing systems to report monitoring results for samples taken and tested prior to promulgation of the UCMR. EPA was concerned that such results might not be comparable to results obtained under this revised UCMR Program because of differences in sampling and analytical protocols, as well as the sampling schedule. Other factors thought to compound the problem of comparability included: (1) monitoring methods may have changed or improved; (2) water quality changes over time; and, (3) today's action requires reporting of a net increase of seven additional data elements, which will allow various, consistent comparisons to be made and data to be aggregated nationally based on current sound-science and quality assurance/quality control consistency. However, EPA received comments recommending that previously collected data should be accepted for the unregulated contaminants on the monitoring list as long as they meet all the requirements of this final rule. In response, EPA reevaluated the circumstances under which previously collected (also referred to as "grandfathered" or "grandparented") data could be accepted, given the statistical and quality assurance/quality control requirements of the UCMR Program. EPA has modified the regulation to allow previously collected data to be reported, as long as the data meet the sampling, testing and reporting requirements specified in 40 CFR 141.35(d) and 141.40(a)(3), (4), (5) and Appendix A. This change will allow for early monitoring and reporting for MTBE, as long as it meets the requirements of the UCMR. By doing so, EPA is responding to one of the recommendations of the Blue Ribbon Panel on Oxygenates in Gasoline, a panel appointed by EPA Administrator Browner, to evaluate the issues posed by the use of MTBE in gasoline. This recommendation consisted of accelerating the implementation of the UCMR, by allowing systems to sample for MTBE prior to the implementation date of January 1, 2001.

E. Waivers

1. Waivers for Systems Serving More Than 10,000 Persons

Section 1445(a)(2)(F) of SDWA allows a State to obtain a waiver of UCMR monitoring for specific contaminants if the State demonstrates that the UCMR listing criteria do not apply in that State. These criteria are:

(a) the criteria for listing a contaminant in the occurrence priorities list in the CCL or the regulatory process identifying contaminant occurrence in two or more States; and

(b) whether an analytical method exists for the contaminant.

When a State makes such a demonstration for a waiver of a specific contaminant on the monitoring list, EPA may waive monitoring for that contaminant in that State for large systems (serving more than 10,000 persons) only.

Stakeholders indicated that waiver requirements should be sufficiently stringent to obtain the most representative national data possible, including non-detections of contaminants on the UCMR (1999) List. Since only the UCMR listing criteria in (a) are relevant to a State-specific waiver and based on stakeholders' concern that the waiver be narrowly applied, EPA is requiring that this waiver be applied only where the State can demonstrate that the contaminant has not been used, applied, stored, disposed, released, or detected in the source waters or distribution systems in the State in the past 15 years and that the contaminant does not occur naturally (such as growth in a system or air deposition) in the State. Source Water Assessments provided for under Sections 1453 and 1428(b) of SDWA may be used as the basis for these waivers if the assessments specifically address the contaminant(s) on the UCMR List for which a waiver is sought. Table 3, Uses and Environmental Sources of Contaminants for the Monitoring List, presents the uses and sources of the contaminants included for the final UCMR (1999) List. A State can apply for a waiver from monitoring for specific contaminants, but must receive EPA approval to waive the monitoring.

While some chemical contaminants may only be discharged into the environment in regional or local areas, microbiological contaminants may be ubiquitous. However, previous monitoring results over time may provide information useful to waiver determinations for microbiological contaminants.

Public comments on system-specific waivers ranged from not allowing waivers for any systems to providing waiver procedures for individual systems. EPA decided that such waivers are not provided by the statute and would be generally inconsistent with the nature of a program that relies on nationally representative data. Detections and non-detections are equally important in deciding whether to regulate a contaminant. If waivers are given to systems not expected to have occurrence of a particular contaminant or group of contaminants, then the resulting data set will be biased toward systems having detections, potentially contributing to an incorrect conclusion about contaminant occurrence and regulation. EPA did not change the rule to allow other circumstances under which contaminant monitoring waivers could be given.

2. Waivers for Small Systems in State Plans

EPA is not allowing waivers to be granted for small systems serving 10,000 or fewer persons in State Plans for the national representative sample. Stakeholders also supported this position. The systems in State Plans will be statistically selected with the assumption that all systems in a particular size category and water source type have an equal probability of being selected. Non-detections are just as important as detections of contaminants for national analysis. Waiving contaminants to be monitored in certain States not expecting to have such contaminants biases the

representative sample toward detections. Selecting the small systems to be included in the State Monitoring Plans for the representative sample through a statistical process effectively waives ninety-seven percent of the systems from the final monitoring requirements (based on using 99 percent confidence level with three percent allowable error). Therefore, EPA rejected waivers for systems serving fewer than 10,000 persons because this approach is contradictory to obtaining a scientifically sound data set that provides the basis for a scientific statistical analysis. The rule was not changed in this regard.

TABLE 3.—USES AND ENVIRONMENTAL SOURCES OF CONTAMINANTS FOR THE MONITORING LIST

Contaminant name	CASRN	Use or environmental source
Proposed Chemical Contaminants		
1,2-diphenylhydrazine	122–66–7	Used in the production of benzidine and anti-inflammatory drugs.
2-methyl-phenol	95–48–7	Released in automobile and diesel exhaust, coal tar and petroleum refining, and wood pulping.
2,4-dichlorophenol	120–83–2	Chemical intermediate in herbicide production.
2,4-dinitrophenol	51–28–5	Released from mines, metal, and petroleum plants.
2,4-dinitrotoluene	121–14–2	Used in the production of isocyanate and explosives.
2,4,6-trichlorophenol	88–06–2	By-product of fossil fuel burning, used as bactericide and wood/glue preservative.
2,6-dinitrotoluene	606–20–2	Used as mixture with 2,4-DNT (similar uses).
Acetochlor	34256–82–1	Herbicide used with cabbage, citrus, coffee, and corn crops.
Alachlor ESA		Degradation product of alachlor, an herbicide used with corn, bean, peanut, and soybean crops to control grasses and weeds.
DCPA di-acid degradate	2136–79–0	Degradation product of DCPA, an herbicide used on grasses and weeds with fruit and vegetable crops.
DCPA mono-acid degradate	887–54–7	Degradation product of DCPA, an herbicide used on grasses and weeds with fruit and vegetable crops.
DDE	72–55–9	Degradation product of DDT, a general insecticide.
Diazinon	333–41–5	Insecticide used with rice, fruit, vineyards, and corn crops.
Disulfoton	298–04–4	Insecticide used with cereal, cotton, tobacco, and potato crops.
Diuron	330–54–1	Herbicide used on grasses in orchards and wheat crops.
EPTC	759–94–4	Herbicide used on annual grasses, weeds, in potatoes and corn.
Fonofos	944–22–9	Soil insecticide used on worms and centipedes.
Lead-210 (Pb-210)	14255–04–0	Part of the uranium decay series, naturally occurring.
Linuron	330–55–2	Herbicide used with corn, soybean, cotton, and wheat crops.
Molinate	2212–67–1	Selective herbicide used with rice, controls watergrass.
MTBE	1634–04–4	Octane enhancer in unleaded gasoline.
Nitrobenzene	98–95–3	Used in the production of aniline, which is used to make dyes, herbicides, and drugs.
Perchlorate	14797–73–0	Oxygen additive in solid fuel propellant for rockets, missiles, and fireworks.
Polonium-210 (Po-210)	13981–52–7	Part of the uranium decay series, naturally occurring.
Prometon	1610–18–0	Herbicide used on annual and perennial weeds and grasses.
RDX	121–82–4	Used in explosives; ammunition plants.
Terbacil	5902–51–2	Herbicide used with sugarcane, alfalfa, and some fruit, etc.
Terbufos	13071–79–9	Insecticide used with corn, sugar beet, and grain sorghum crops.
Microbiological Contaminants		
Adenoviruses	N/A	Fecal sources; hand to mouth transmission.
Aeromonas	N/A	Present in all freshwater and brackish water.
Cyanobacteria (Blue-green algae), other freshwater algae and their toxins.	N/A	Bloom in surface water bodies; produce toxins.
Caliciviruses	N/A	Contaminated food and water, raw shellfish.
Coxsackieviruses	N/A	Fecal sources; hand to mouth transmission.
Echoviruses	N/A	Fecal sources; hand to mouth transmission.
Helicobacter pylori	N/A	Fecal sources; hand to mouth transmission.
Microsporidia	N/A	Occur in rivers, ponds, lakes, and unfiltered water.

F. Representative Sample of Systems Serving 10,000 or Fewer Persons

As required by section 1445(a)(2)(A) and (C), the regulation requires that only a representative sample of public water systems serving 10,000 or fewer persons must monitor for unregulated contaminants. As previously explained, only community and non-transient non-community systems are required to monitor for unregulated contaminants under this action. Therefore, the representative sample will include only community and non-transient non-community systems serving 10,000 or fewer persons. The representative sample must be of sufficient size to gather the necessary information on occurrence of unregulated contaminants to determine whether or not to regulate them, while not burdening every water system with the expense of monitoring. The number of systems selected within each of three size ranges of small systems will be based on the proportion of the State's population served by systems in that size range. (An example appears in Section 5.(a), "State Plans for the Representative Sample".) The small systems in the national representative sample will be selected using a stratified random sampling process. This process will utilize a random number generator to choose a statistically determined number of systems in each State, considering the proportion of the population served by CWSs and NTNCWSs by water source type (i.e., ground or surface water) and system

size category (i.e., 25 to 500 persons, 501 to 3,300, and 3,301 to 10,000) within the water source type. The regulation stipulates that the national representative sample is the basis for the State Monitoring Plan in each state. The use of this statistical approach is designed to take into account different system sizes, types of systems, the source of supply, contaminants likely to be found, and geographic location. EPA believes that the statistical process for selecting systems to monitor must yield data that are sufficient to answer questions about occurrence of contaminants on a national scale for use in exposure assessments and technology evaluations of alternative treatments at a PWS and in its watershed. These data should also be sufficient to answer questions on a broad multi-state scale, such as systems classified by size or source of water, particularly when combined with data for the 2,774 large systems.

Under this action, small system monitoring will be too sparse to answer questions about occurrence at the scale of a single State. The number of systems required for evaluation of occurrence in a single State is far greater than, and thus more costly than, those needed for the broader national evaluations required under the Act to determine whether or not to regulate a contaminant and to assist in developing future drinking water regulations.

1. System Size

Based on statistics reported in the Safe Drinking Water Information System (SDWIS) database, the following numbers of systems (1997 data) by size will approximate the universe from which a representative sample of systems serving 10,000 or fewer people will be taken for the national representative sample plan. These system size categories are used in other statutory and regulatory characterizations of systems, and are applied under the existing rule for unregulated contaminant monitoring for the scheduling of sampling. The relevant system and population information (1997) for systems serving 10,000 or fewer persons is:

No. of people served in PWS size range	No. of PWSs in size range	Population served nationally	
		CWS	NTNCWS
25–500	48,100	5,249,577	2,379,034
501–3,300	14,126	19,918,106	2,724,728
3,301–10,000	3,410	25,236,059	401,579
Total	65,636	50,403,742	5,505,341

Considering all community water systems and nontransient non-community water systems that do not purchase their water supplies, 65,636 PWSs are in the size range for small systems as defined in Section 1445. In response to public comments that indicated the appropriateness of including purchased water systems, EPA revised this rule to cover systems purchasing water from other systems if their distribution systems are the locations of the maximum residence time or lowest disinfectant residual in relation to the combined water seller-purchaser distribution system. Purchased water systems will not be required to monitor for contaminants for which the sampling location is specified as the entry point to the distribution system because they could bias results by potentially causing double counting of contaminant occurrence.

2. System Type

(a) Public Water System Monitoring

Under today's action, all public water systems serving 10,000 or fewer persons, except transient non-community systems, will be considered for monitoring, but only a subset will be selected for the national representative sample. Purchased water systems will be excluded from UCMR monitoring for contaminants where the sampling point is identified as the entry point to the distribution system. Public water systems owned and/or operated on Tribal lands by Tribes will have the same probability of being selected for the national representative sample as any other system in its water source-system size category. EPA will identify the size of the representative sample and the specific systems required to monitor and send the list of systems to the States for review and inclusion in State Monitoring Plans (discussed in Section V. F. 5).

(b) Nontransient Non-Community Water Systems

Nontransient non-community water systems (NTNCWSs) represent schools, hospitals and other facilities in communities that serve the resident population but have their own water supply systems. Approximately 20,000 systems of this type exist in the United States. Today's final regulation at § 141.40(a)(1)(iii) includes NTNCWSs as a separate type of water system to be included in the representative sample for monitoring. Typically, these systems are closely associated with a local resident population and may be a significant source of water consumed by that population over a lifetime. The selection of NTNCWSs will use the same statistical process as for CWSs, with systems grouped within a State by water source type and size category. NTNCWSs are considered separately to avoid double-counting the population served when conducting exposure assessments of both small CWSs and NTNCWSs, while allowing weighting of lifetime water consumption by system type.

(c) Transient Non-Community Systems

Transient non-community water systems represent systems providing drinking water to transient populations such as at a restaurant in a rural location or a highway roadside rest area. About 97,000 of these systems exist in the United States; their location and type are highly variable. It will be difficult to extrapolate exposure from monitoring results, given the very short-term nature of the systems' use by individuals who may not be in the area for more than a few hours or days. Because of problems with implementation and cost for sampling such a large and highly variable set of typically very small systems, EPA has excluded transient systems from all unregulated contaminant monitoring requirements in this final rule. In this regard, this action is consistent with the current UCMR Program. Four of the five public commenters addressing transient systems supported exclusion of transient systems from requirements for unregulated contaminant monitoring.

3. Geographic Location

SDWA Section 1445 specifies that State plans should consider "geographic location" when selecting a representative sample. This is

accomplished at the broadest level by selecting systems from each State. However, within a State, the sources of water may not be evenly distributed across that State, especially surface waters. Cities transfer water across watershed boundaries, or move water from one State to another. To best represent water being consumed by individuals, EPA defines "geographic location" in the representative sample for the final rule today as the location of the source of water, rather than as an even distribution of points across the State. For example, if 40 percent of the people in a State obtain their water from one water source type (e.g., surface water), 40 percent of the systems selected for the representative state sample should be from that source type, even if this results in points unevenly distributed across the State. This distribution should be accommodated by allocating systems based on the population served nationally and in each State stratified by water source and system size category.

4. Likelihood of Finding Contaminants

Section 1445(a)(2)(A) requires that the UCMR Program take into account the likelihood of finding a contaminant in establishing variable monitoring requirements for systems. The final rule allows the UCMR Program to focus on monitoring for contaminants that are expected to be found nationally or within several regions of the United States. Therefore, the expectation of finding the contaminants nationally is fundamental to the approach of the representative sample and its statistical method of selection. The "likelihood of finding contaminants" factor is accommodated by the step-wise three-tiered approach of Pre-Screen Testing, Screening Survey and Assessment Monitoring.

5. State Plans for the Representative Sample

As discussed previously, Section 1445 (a)(2)(C) allows States to develop State Monitoring Plans (also referred to as "State Plans") to assess the occurrence of unregulated contaminants for small systems in the State. EPA believes that the development of State Plans is affected by two other considerations: (i) the State plans must fit together into a national representative sample so that it is, in fact, nationally "representative," and (ii) EPA will pay for the reasonable costs of testing and laboratory analysis necessary to carry out monitoring at State Plans, pursuant to Section 1445(a)(2)(C)(ii).

(a) Representative State Plans

To have representativeness at the national level while at the same time allowing each State to develop a "State Plan," the testing for which EPA will fund, the Agency will take the following approach. Based on a statistical random selection process applied to all CWSs and NTNCWSs nationally using the average population served by systems and water source type (surface or ground water to ensure geographic coverage) within service-size categories (25–500, 501–3,300, 3,301–10,000 persons), EPA will select at least twice as many CWSs and NTNCWSs as required for the national representative sample. EPA will use a random number generator to select these systems. These systems will be divided into an "initial plan" list and a "replacement list" to allow for replacement of systems on the list with systems from the replacement list, by States. The representative sample will be allocated on a State basis, and then stratified by water source type and then by service size category within each water source type. EPA will use the percentages of the populations served in each water source-system size category to further allocate the systems in each State. The "initial plan" list of systems will identify those systems tentatively selected by EPA for each State. To establish a State Plan for small system monitoring, a State may enter into a Memorandum of Agreement (MOA) with EPA to take a partnership role in the development and implementation of the State Plan. By agreeing to participate in the process for the State plan through the MOA, the State must accept the EPA-selected systems on the "initial plan" as its plan, or review the list to determine which systems should be removed from the list because of such factors as closure, merger, or water purchase arrangement and submit a modified plan. The State must replace the system(s) they remove from the list with the water system(s) from the "replacement list" in the order the systems are listed in the replacement list, thus creating a "modified plan." The State, in either case, must inform the EPA of the State's choice of plan (i.e., "initial" plan or "modified" plan) along with reasons for removing and replacing systems on the "initial plan" within 60 days of receiving the "initial plan." If the State decides not to enter into an MOA with EPA for the State Plan process, then the EPA will consult with the State before the State adopts the "initial plan" as its State Plan. In a State with an MOA, the State Plan will include a process for the State to inform the public water systems of their responsibility to monitor and report results, their vulnerable time period, other monitoring times, sampling instructions, and of their participation in the screening survey and pre-screen testing. The EPA will inform systems of their inclusion in the representative sample if the State chooses not to enter into an MOA for the State Plan. This approach ensures a nationally representative set of systems and allows a State flexibility to modify EPA's "initial plan" with minimal burden. EPA will develop and provide initial plans to States and Tribes in the first half of year 2000 to allow sufficient time for State/Tribal review and modification, and for informing systems selected for the State Plans.

Statistical Approach. Under today's action, the representative sample of small public water systems will be composed of a subset of systems which, in the aggregate, represent the public water systems of the three small system size categories within the United States. Within a State, public water systems will need to be selected so that the proportion of persons served by the systems sampled is as close as possible to the proportion of persons served by that system size category within each water source type for that State. The portion of the national representative sample within a State's boundaries will become that State's Monitoring Plan, after review and possible adjustment by the State, and then EPA review.

For the small systems considered, a representative sample size of approximately 800 systems will provide a confidence level of 99 percent with an allowable error of plus or minus 1 percent. This number of systems is statistically derived to allow population weighting for exposure assessment. Because of population weighting in the selection of the representative sample, systems are a surrogate for the number of people being monitored for unregulated contaminants in their drinking water. Since population exposure assessment is the principal use of the data in the regulation development process, the quantity of interest is the fraction of people exposed, rather than the fraction of systems affected. However, the law requires measuring contaminant occurrence at systems and it is more efficient to measure at systems. So the population weighted plan allows EPA to recognize systems providing drinking water to their service population as a surrogate for people. When the goal is exposure assessment, then a population weighted sampling plan for systems is optimal. The results can also be used to

estimate the number of systems affected, although the selected population weighted plan is not optimal for this purpose.

The results will also be useful for analysis of contaminant occurrence at small systems in national analyses by water source and system size categories or strata, with a confidence level of 95 percent and a one percent margin of error. EPA will allocate systems to each State, water source type and system size category by: (1) estimating the population served by all small CWSs in each State, (2) dividing this population into the population served in each water source type-system size combination to derive a percentage, and (3) multiplying the percentage by the number of small systems in the State, with the result being the number of systems allocated to each water source-system size category. This allocation is a statistical stratification of systems by water source type and system size category. The approach ensures that each State has systems allocated to it for its State Plan. To accomplish this allocation of systems to each State, EPA will add a sufficient number of small CWSs and NTNCWSs to the statistically derived number for the representative sample to allow each State to have a plan that will then fit into the national representative sample, with each State having at least two systems. Once monitored, the results of the representative sample of small systems will then be combined with large system results in an overall national analysis of contaminant occurrence in systems. EPA believes that this sample size will provide an adequate level of confidence, considering size, type (community and non-transient non-community water systems), geographic location (State), and water source. EPA also believes that this approach provides sufficient information for the decision processes drawing on UCMR monitoring data for systems serving 10,000 or fewer persons, while keeping testing costs at a manageable level. This number of systems should be sufficient to statistically evaluate whether a contaminant occurs in a specified proportion, such as 2 or 3 percent of the population (using systems as a surrogate). This number of systems, confidence level and allowable error will enable EPA to: (1) evaluate the statistical significance of contaminant occurrence with low frequency and (2) compute the percent of systems for occurrence nationally, combining the results of both small and large systems.

Further rationale for using a small number of systems and small allowable error (confidence interval) in calculating the number of systems to be included in the representative sample is provided in the monitoring results from previous unregulated contaminant monitoring under the existing program. EPA has results from over 28,000 systems from the unregulated contaminant monitoring activities of 1988 to 1992 (the first round of unregulated contaminant monitoring under the existing program) that indicate that of the 34 contaminants required to be monitored at that time, 30 occurred at less than 2 percent of systems and, of those, 27 occurred at less than 1 percent of systems. Ten of these contaminants were selected for the Contaminant Candidate List "Regulatory Priorities" (see 64 FR 23403) and all of the ten contaminants occurred at less than 2 percent of systems and eight, at less than 1 percent. Of the eight contaminants occurring at less than one percent of systems, four have health effects values within the concentration range of contaminant occurrence (bromomethane [a pesticide], 1,3-dichloropropene [a pesticide], hexachlorobutadiene [a solvent], and 1,1,2,2-tetrachloroethane [a solvent]), and consequently may be considered for future regulation. These data point at the need to focus at the low end of occurrence. Using a small allowable error minimizes the chance of EPA incorrectly deciding whether or not to regulate a contaminant based on occurrence. Once EPA evaluates health effects data, contaminant occurrence among States and systems, contaminant sources, treatment technologies, and other relevant information, the small allowable error allows EPA to make regulatory determinations with a high degree of confidence.

If, based on prior information (e.g., from a Screening Survey or Pre-screen Testing), EPA determines that the listed contaminants occur in a different percent of systems at a different statistical confidence level and/or allowable error providing scientifically defensible monitoring results, then EPA may apply a different likely percent of systems, confidence level, and/or allowable error to determine a smaller representative sample size. The statistical approach for specifying the number of systems by water source type (ground water, surface water or ground water under the direct influence of surface water) and systems size is as follows:

The number of systems, n, required in the representative sample is determined by the allowable error ($\pm d$) around the estimate for p, the proportion of systems (a population-weighted surrogate for people) which exceed a criteria (e.g., detection level) of interest. Based on the binomial distribution in statistics, the number of systems n which must be sampled for a likely proportion p of people (systems as a surrogate) with contaminant occurrence within the allowable error d with confidence $(1 - a)$ is approximately:

$$n = \frac{z^2_{(a/2)} p(1-p)}{d^2} \qquad (1)$$

The number of systems to be sampled, n, does not depend on the total number of systems available. The number from the standard normal distribution, z, is obtained from a table of the standard normal distribution, representing a collection of data following a "bell-shaped curve" which have a (standardized) mean of zero and standard deviation of one. The significance level, a, is the chance of the statistical interval of interest not containing the true value of the number being estimated, which, in this case, is the percent of systems where contaminants of concern on the UCMR List occur. The true value for the percentage of systems where contaminants of concern occur can only be known if all systems are sampled, which is not a possibility since Section 1445(a)(2)(A) requires that only a representative subset of small systems be required to monitor for unregulated contaminants. Using this equation (1), the matrix below presents the required sample sizes for several values of allowable error margins and confidence levels. For the national representative sample, an allowable error of ±0.01 at a confidence level of 99 percent and a likely proportion of systems with contaminant occurrence of 1 percent was chosen. The possibilities for sample size, confidence level and allowable error considered in developing this approach are:

SAMPLE SIZES FROM A UNIVERSE OF 65,600 SYSTEMS BASED ON: CONFIDENCE LEVEL

Confidence Level (1-*a*)	*d*, Allowable Error			
	.03	.02	.01	.005
90%	30	67	266	1,065
95%	42	95	380	1,521
99%	73	165	659	2,636

EPA believes that a representative sample size of 659 systems to be sufficient to draw conclusions about contaminant occurrence for small systems, based on 99 percent (.99) confidence level, ± a 1 percent (.01) allowable margin of error (confidence interval), and target percent of contaminant occurrence in 1 percent of systems. EPA chose a confidence level of 99 percent because it wanted high confidence that the true proportion was included in its sample results. A 5 percent chance that the window of error did not include the true proportion was considered too large, given the amount of money invested in monitoring and regulatory decisions. Based on the monitoring program, a 1 percent risk (100 − 99 percent confidence) that EPA missed the target was more acceptable.

A small allowable error (narrow confidence interval), such as ±1 percent (±0.01), is important for evaluating the expected low percentages of contaminant occurrence in systems because EPA wants to be able to determine when the monitoring results show that the percent of systems is distinguishable from zero or some other small value close to zero. Determining this outcome will help EPA decide which contaminants should receive primary focus for possible regulation after the results are evaluated with health effects data.

To further consider the implications of the table above, suppose that after sampling these 659 systems, the proportion *p* which equaled or exceeded a detection level was 4 percent (0.04). The estimate of the true (unknown) proportion will be 0.04±0.02, or 4 to 6 percent. This interval has a 99 percent likelihood of containing the true proportion of systems having an occurrence of the contaminant of concern. There is a 1 percent (0.01) chance (*a*) that the true proportion is outside this estimated interval. A larger allowable error, *d*, (e.g., 3 percent) results in a wider estimate window. Knowing only that the proportion is somewhere within a window of 6 percent (e.g., between 1 and 7 percent) was too large a window of error if the percent of systems having occurrence of the UCMR (1999) List contaminants is less than 3 percent, which may be possible based on information from previous unregulated contaminant monitoring. In such a situation, it will be difficult to determine whether the percent of systems with contaminant occurrence was significantly different than zero or some small number.

For the purposes of data interpretation in the future, EPA has determined that, rather than using the normal approximation to the binomial distribution, the Agency should use the Wilson score interval method (Newcombe, 1998) which results in a confidence interval around the estimate of the percent of systems with contaminant occurrence which is narrower on the left or "zero" side of the estimate and wider on the right side of the estimate. One advantage to this interval is that it does not include zero whenever the estimated exposure is non-zero.

Additionally, EPA will increase the representative sample size of CWSs to 721 to increase the statistical power of the smallest system category. EPA will also add 79 systems to the NTNCWS sample size (using the same approach of applying the percentage of population served by NTNCWSs in each State to derive the number of systems allocated to each State). A total of 800 CWSs and NTNCWSs are included as the national representative sample. This allocation facilitates assigning systems to each State in the representative sample, allowing each State to have at least two systems.

Technical peer review of the statistical approach found it to be sound for the purposes of estimating contaminant occurrence to assess population exposure to the contaminants from Assessment Monitoring. Both internal and external peer review indicated the possibility of using another statistical method (such as the Poisson approximation to the binomial distribution or Wilson score interval method) to derive the number of systems in the national representative sample and to interpret the data at a given confidence level and error once they are reported. Additionally, the public commenters supported the statistical approach for deriving and implementing the national representative sample of small systems.

The representative sample of 721 small CWSs and 79 NTNCWSs will be disaggregated to the State level, and stratified by water source type (ground water or surface water) and system size (the three size categories of 25–500, 501–3,300, and 3,301–10,000 persons). The stratification by State, water source type and system size is described in the following example.

Example. To determine the number of PWSs (CWSs and NTNCWSs) randomly selected for unregulated contaminant monitoring as part of the national representative sample, the following figures are used as the starting point and are approximations for the purposes of example only:

US population: 265,000,000

US population served by small PWSs serving ≤ 10,000 persons: 50,000,000

State A's population served by small PWSs serving 10,000 or fewer persons equals 1,251,340 persons, which divided by 50,000,000 persons served nationally by small water systems equals 2.5 percent, or the percent of State A's population served by small systems of the national population served by small systems. Multiplying 2.5 percent (0.025) times the 659 systems nationally equals 16.48, rounded to 16, which is the number of small systems allocated to State A for its representative sample. Mathematically, this can be expressed as:

$$\frac{1{,}251{,}340 \text{ persons in State A}}{50{,}000{,}000 \text{ persons in U.S.}} \times 659 \text{ systems in sample for U.S.} = 16 \text{ systems in State A's sample}$$

State A's population served by small PWSs supplied by surface water (SW) or ground water under the direct influence of surface water (GWUDI) equals 449,920 persons.

State A's population served by small PWSs supplied by ground water (GW) equals 801,420 persons.

For each water source type (surface or ground water), the population served by small systems is further divided into the size category. The next step is to divide the population in each size category by the population served by small systems in State A (1,251,340 persons), and then multiply that result by the number of small systems allocated to State A (18 systems), to obtain the number of systems in that size category for the water source type that will be in the State Plan (identified below as "State Plan Allocation"). For each water source type, the example results for State A are:

SW/GWUDI SYSTEMS IN STATE A

[Numbers of systems rounded to nearest whole number]

System size (persons served)	Population served by size category		Number of persons served in state A		Systems allocated to state A		State plan allocation
10,000–3,301	281,200 persons	÷	1,251,340	×	16	=	4
3,300–501	154,660 persons	÷	1,251,340	×	16	=	2
500–25	14,060 persons	÷	1,251,340	×	16	=	0
Total							6 systems

GW SYSTEMS IN STATE A

[Numbers of systems rounded to nearest whole number]

System size (persons served)	Population served by size category		Number of persons served in state A		Systems allocated to state A		State plan allocation
10,000–3,301	421,800 persons	÷	1,251,340	×	16	=	5
3,300–500	239,020 persons	÷	1,251,340	×	16	=	3
500–25	140,600 persons	÷	1,251,340	×	16	=	2
Total							10 systems

The total of 6 surface water and 10 ground water systems equals 16 systems, the number to State A's Plan. The replacement list of systems will also be developed and provided at this level of detail.

Sampling Plan. The sampling plan that EPA is considering is outlined here. As shown in the first matrix of confidence levels, the overall confidence level is established at 99 percent (0.99). The small water systems were allocated on the basis of population served, except in the very small strata, which EPA supplemented to bring the statistical inferential ability up to 95 percent in all cells of the confidence level matrix.

System Size Category	Desired Confidence Levels by Source Type		
	Ground Water	Surface Water	All Sources
Very Small (25–500 persons)	0.95	0.95	0.95
Small (501–3,300 persons)	0.95	0.95	0.95
Medium (3,300–10,000 persons)	0.95	0.95	0.95
All System Categories	0.95	0.95	0.99

SAMPLING PLAN

System Size Category	Planned national water system allocation by source type		
	Ground water	Surface water	All sources
Very Small (25–500 persons)	67	64	131
Small (501–3,300 persons)	186	74	260
Medium (3,300–10,000 persons)	189	141	330
All System Categories Subtotal	442	279	721
NTNCWS Subtotal			79
Total			800

Both the very small ground water and surface water systems categories contained too few systems to have a confidence level of 95 percent. The very small ground water category needed 6 additional systems and the very small surface water category needed 56 systems to bring them up to the 95 percent confidence level. These numbers of systems will be allocated to each State based on the number of persons served in each subcategory within the State. (Note that the example presented above did not reflect an additional allocation to the "very small" strata for surface or ground water systems for State A. Such an outcome would result because State A had a low number of people in this category relative to other States and would not be allocated an additional system in this plan.)

EPA has prepared a background document titled "National Representative Sample of Small Public Water Systems: Statistical Design and State Plans for the Unregulated Contaminant Monitoring Regulation" to describe in more detail this selection process and its relation to the State Plans. The background document is available by calling the EPA Safe Drinking Water Hotline at (800) 426-4791, or by viewing it on EPA's Internet Homepage for the Office of Ground Water and Drinking Water (www.epa.gov/safewater).

EPA asked for public comment on whether it should consider using a targeted approach for selecting systems in the national representative sample based on prior knowledge of contaminant use or occurrence, system operation or other locational information, rather than this stratified random selection approach. Internal and external peer reviewers and public commenters agreed that a targeted approach would bias the national results.

Several aspects of potential bias are of concern to EPA: (1) prior information on targeted use of a contaminant may not be perfect which may lead to missing the target zone; (2) targeting leads to biased results that would be expected to have a larger percentage of detections, potentially overstating occurrence of the contaminant; (3) targeting areas of known or expected contaminant use or occurrence for monitoring does not provide a representative national picture of occurrence, because both detections and nondetections of contaminants are equally important in determining national occurrence in the decision process of whether or not to regulate a contaminant; and (4) targeting areas of known or expected use or occurrence does not take into account that surface waters can carry the contaminant out of the targeted area.

The State Monitoring Plans will also include a representative sample of small systems that will be combined with a set of randomly selected large systems for Screening Survey monitoring of UCMR (1999) List 2 contaminants. The number of small systems, selected through the same statistical process from the systems used to conduct Assessment Monitoring, will be smaller (perhaps 150 to 200 systems out of a total number of about 300 small and large systems) because the purpose of the Screening Survey is to test for contaminant presence in systems rather than testing for concentrations in an established percentage (such as 2 or 3 percent) of systems, as is the case for Assessment Monitoring. If a contaminant occurs in a small percent (e.g., 0.5 percent) of systems, then the contaminant will be considered to occur at a level that will indicate that it should be included in the next round of Assessment Monitoring.

EPA needs to balance the number of systems included in the national representative sample required for statistical validity with the cost of paying for the testing. EPA believes that the final rule's approach balances the number of systems to be tested with the cost and also balances a nationally representative sample with the allowance for State plans. The final approach also relieves States from having to develop the statistical design and specify the systems to be monitored.

(b) Systems Selected for Pre-Screen Testing

If a State enters into an MOA with EPA, it can participate in the Pre-Screen Testing program. States must specify from 5 up to 25 systems as the systems most vulnerable to the contaminants on UCMR (1999) List 3. EPA will determine the number of systems to be selected in any State based on the population served by CWSs and NTNCWSs in a State. The States must modify their State Plans to identify the small systems selected for Pre-Screen Testing and notify the EPA of their addition to those Plans.

(c) Tribal Water Systems

Public water systems serving less than 10,000 persons that are located on Tribal lands in Indian country will be treated as an individual stratum for the representative sample. The stratified random selection process described previously allocates systems within water source and size category by population served. A PWS in Indian country will have the same probability of being selected as any other water system in another State based on the proportion of the population served by water source and system size category. Because no State has jurisdiction over such systems, EPA will consult with the appropriate tribal government concerning whether any initially selected system should be replaced due to merger, closure, or purchase of water from another system. The resulting set of systems will be the "State Plan" for Indian country.

Public comments relative to Tribal water systems requested that Tribal systems be specified through a stratified random selection process like the other systems in the national representative sample to avoid biasing the results. EPA agrees and plans to identify Tribal systems through the same stratified random selection process that is applied to the other systems.

(d) "Index" Systems

EPA generally has less information about systems serving 10,000 or fewer persons than about systems serving more than 10,000 persons. This lack of information on these systems and their operation affects EPA's ability to tailor regulations to systems of this size. To provide an improved understanding of small systems, EPA will select up to 30 small public water systems as "Index" systems and EPA will conduct Assessment Monitoring at these systems during each of the five years for which the UCMR List and national representative sample must be established. EPA is requiring more frequent monitoring from these systems than the systems selected for Assessment Monitoring. Index systems must be selected from the systems designated in State Monitoring Plans using a random number generator. EPA will pay for this monitoring, including provision of sample equipment, shipment of samples, testing, and reporting. EPA will help Index systems collect samples by sending a field technician to each Index system to obtain the samples. Index system sampling is being conducted to: ensure sample collection quality for the 30 systems; provide information of temporal variation encountered during the monitoring cycle; and better understand the needs of small public water systems in future regulations. The Index system sampling program is designed to ensure that future regulations better reflect the conditions under which small systems operate. 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. The monitoring results for the Index systems will be used to characterize the UCMR results to other small systems in the national representative sample with this frequency and for this additional information. EPA or its representative will also collect information on precipitation, land use and other environmental factors (e.g., soils and geology) to provide the Agency with information on other conditions potentially affecting drinking water quality of small systems. This Index system monitoring will facilitate extrapolation of Assessment Monitoring results nationally for systems of this size. A description of the selection process for Index systems using a random number generator will be presented in the background document, noted above, titled "National Representative Sample of Small Public Water Systems: Statistical Design and State Plans for the Unregulated Contaminant Monitoring Regulation."

Public comments received concerning Index systems were generally supportive of the approach to provide additional information to tailor future regulations to small systems.

(e) Other State Data

Some States may sample and test additional systems beyond those included in the State Monitoring Plan. Any additional systems sampled by States should not be combined with those of the State Monitoring Plan for the purpose of computing national estimates of contamination. While providing useful information for protecting the health of persons using drinking water from these systems, this additional data will bias the results of the national representative sample if included. However, if the State wants to report the results of such monitoring, EPA could receive the data through the Safe Drinking Water Information System (SDWIS) for input to the NCOD. EPA plans to develop acceptance criteria to allow such data to be placed in the NCOD. Public comments supported EPA's position that any data from additional systems not in the State Monitoring Plan should not be combined with data from the representative sample of small systems because it would bias the national results.

G. Reporting of Monitoring Results

Today's final regulation replaces the reporting requirements at 40 CFR 141.35 to make the reported occurrence results more useful for sound scientific analyses.

1. Reporting Requirements (Data Elements)

UCMR data are one of four types of data that will potentially be reported to the NCOD as required by Section 1445(g). The other types of data that may be included in the NCOD are: (1) regulated contaminant occurrence data below the maximum contaminant level (MCL) but above the minimum reporting level (MRL) (a regulation may be developed to obtain this data during 2000); (2) source water monitoring data; and (3) other data from special studies and research. Since these data will come from varying sources, they may have different reporting requirements. The PWS data from unregulated contaminant monitoring may have the smallest number of data elements to be reported because of the greater level of control over the quality of the data through the laboratory certification programs and the monitoring and quality control requirements in the final rule today.

EPA engaged in an extensive process of stakeholder and technical review when developing the NCOD to identify information reporting requirements that allow data from different sources to be adequately evaluated, compared, and interpreted. The NCOD information requirements process identified additional data elements that must be considered for UCMR reporting with unregulated contaminant sample test results. These data elements are especially important because many of the contaminants may not be routinely tested for and will need sample test data quality indicators to assist in interpreting the results. These additional data elements for the unregulated contaminants, and the reasons EPA adds them to the previous reporting requirements in this rule, are explained briefly in the following table. EPA requested public comment on these additional reporting requirements identified in Table 4, Final Additional Data Elements for the UCMR. The only comments EPA received, other than support for the additional data elements to be reported, were to clarify Minimum Reporting Level and Method Detection Level reporting and their difference from Instrument Detection Level and Estimated Detection Level and to use "presence/absence" for microbiological contaminants only. A technical peer reviewer also suggested that spiking concentration be added to the reporting requirements to allow evaluation of the methods being used, since the methods are still being refined. The reader is referred to the document titled, "Public Comment and Response Summary" for the Unregulated Contaminant Monitoring Regulation for a discussion of these comments. The complete list of data elements for the UCMR appears in the rule at § 141.35(d), Table 1.

TABLE 4.—FINAL ADDITIONAL DATA ELEMENTS FOR THE UCMR

Final data element	Definition	Reason for reporting
Public Water System Facility Identification Number—Source, Treatment Plant and Sampling Point.	An identification number established by the State, or, at the State's discretion, the PWS, that is unique to the system for an intake for each source of water, a treatment plant and a sampling point. Within each PWS, each intake, treatment plant and sampling point must receive a unique identification number, including, for intake; surface water intake, ground water well or wellfield centroid; and including, for sampling point; entry points to the distribution system, wellhead (or wellfield), intake, or locations within the distribution system. The same identification number must be used consistently throughout the history of unregulated contaminant monitoring to represent the facility.	Identify source water, treatment plant and sampling location for use in evaluating contaminant source controls in regulation development. The source intake/well identification number can be related to latitude and longitude for use in geographic analysis of land use, soils, geology and precipitation for alternative treatment and control analysis. Treatment plant identification number can be related to treatment information for that plant to use in analysis of alternative treatments. Sampling point identification number will allow the sample test result to be consistently associated with the same sample location over time for trend analysis.

TABLE 4.—FINAL ADDITIONAL DATA ELEMENTS FOR THE UCMR—Continued

Final data element	Definition	Reason for reporting
Sample Analysis Type	The type of sample collected. Permitted values include: (a) Field Sample—sample collected and submitted for analysis under this rule. (b) Batch Spike/Spike Duplicate Samples—Samples associated with a batch for calculating analytical precision and accuracy. A batch is a collection of 22 samples analyzed together, of which two are the spike and spike duplicate samples, that are tested for analyte concentrations.	Indicates field and spiked sample to ensure that the sample test result is used for the appropriate analysis (e.g., contaminant concentration trends, sample test performance, etc.).
Detection Level	"Detection level" refers to the detection limit applied to both the method and equipment. Detection limits are the lowest concentration of a target contaminant that a given method or piece of equipment can reliably ascertain and report as greater than zero (i.e., Instrument Detection Limit, Method Detection Limit, Estimated Detection Limit).	Indicates lowest quantifiable measurement level applied through the method to the sample to allow comparison with other sample test results.
Detection Level Unit of Measure	The unit of measure to express the concentration, count, or other value of a contaminant level for the detection level reported. (e.g., µg/L, colony forming units/mL (CFU/mL), etc.).	Indicates the reporting unit for the detection limit.
Batch Identification Number	A unique number assigned by the laboratory analyzing samples to a specific batch of samples. The number comprises 9 digits for the laboratory identification number, 4 digits for the year, 2 digits for the month, 2 digits for the day, and 2 digits for the batch of samples.	Allows calculation and comparison of precision and accuracy among batches of samples and association of precision and accuracy with each sample in a batch to sort results based on data quality.
Spiking Concentration	The concentration of method analytes added to a sample to be analyzed for calculating analytical precision and accuracy.	Allows calculation of precision and accuracy for a batch of samples and an evaluation of the method.
Analytical Precision	For purposes of the 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 RPD between spiked matrix duplicates using, RPD = $[(X_1 - X_2) / \{(X_1 + X_2)/2\}] \times 100$.	Indicates variability among laboratory results as measured by testing replicate field or duplicate spiked samples, and is a key measure of sample test performance.
Analytical Accuracy	For the purposes of the UCMR, 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.	Indicates whether test results are within a group of measurements corresponding to the true value of the results, and is a key measure of sample test performance.
Presence/Absence	*Chemicals:* Presence—a response was produced by the analysis (i.e., greater than or equal to the MDL but less than the MRL)/Absence—no response was produced by the analysis (i.e., less than the MDL). *Microbiologicals:* Presence—indicates a response was produced by the analysis/Absence—indicates no response was produced by the analysis.	Chemicals: Indicates results that do not have a quantifiable value and whether, for a positive result, the chemical concentration is between the MRL and the MDL to allow more thorough assessment of the method's capability to identify the contaminant. Microbiologicals: Allows measure under conditions and for microorganisms that are not able to be counted.

Note that EPA deleted "composite" from the proposed set of data elements since the final rule does not allow compositing. Since this program is designed to measure actual occurrence of contaminants, compositing (the combining of samples from several sampling points of a water system) will dilute concentrations of contaminants to be measured. Stakeholders supported the deletion of compositing, and believed it to be contrary to the objectives of the UCMR. No public comments were received on this subject.

Also note that "Public Water System Facility Source Intake Identification Number" must currently be reported under existing reporting requirements for SDWIS under 40 CFR 142.15(b)(1). The UCMR will expand this requirement to include the unique identification numbers for treatment plant and sampling point, which may not change over time. EPA is not requiring, through today's action, the reporting of treatment data (treatment objectives and processes) since these data are already required to be reported by January 1, 2000, for all systems. (Safe Drinking Water Information System

FACT SHEET, Revised Inventory Reporting Requirements, June 1998)

The rationale for including these data elements is that EPA needs the detailed information concerning the sample test, location, and treatment that will allow the results to be used in making a determination of whether or not to regulate the contaminant and to develop regulations. The specific reasons are identified in Table 4. To avoid duplicate and costly resampling efforts, EPA believes that systems should obtain and report the most complete information the first time a sample is tested.

The information requirements process for development of the NCOD identified technical questions that need to be answered in the regulatory process that the UCMR is to support. These data elements are associated with these questions. While the list of data elements will increase by five (from 12 to 17) in today's final UCMR (as compared to the existing UCMR), reporting them the first time precludes the need to obtain the information through another process. Because the 1996 SDWA Amendments expanded the determinations and types of analyses that need to be conducted to develop a rule, including these data elements is responsive to the new regulatory environment in which drinking water regulations must be developed.

These new data elements will not be a major burden for a PWS. Only four of the elements must be supplied by the PWS: the PWS ID; the Facility ID; the sample number; and sample collection date. All other elements can be supplied by the laboratory.

States commented that EPA should not require system inventory data if those data are required under another reporting arrangement in 40 CFR 142.15(b)(1). As a result, EPA modified this final rule eliminating inventory data elements that are required for other reporting. Today's rule requires that Public Water System Facility ID be reported. Coupled with the PWS ID, the facility ID can be linked to sampling site information and locational data necessary for thorough analyses of the data.

As explained earlier, EPA also requires owners/operators of Index systems that are part of State Plans for the national representative sample to provide data concerning well casing, screen depths and pumping rates at each well or intake at the time of monitoring. This reporting will allow EPA to tailor regulations to systems serving 10,000 or fewer persons by relating sample test results to conditions that affect capture of contaminants by ground water and surface water supplied systems.

2. Reporting to the Primacy Agency

Today's rule changes reporting relationships for unregulated contaminant monitoring data. The statute requires that the results be reported to the primary enforcement (or "primacy") authority for the system. Many States and systems raised questions about the necessity and utility of requiring State primacy for the UCMR. In response to these comments, EPA has decided to directly implement the UCMR, while allowing States to participate in State Plan review and implementation through MOAs rather than through State primacy. Some States noted that UCMR data will primarily be used by EPA to make regulatory determinations, and that such data are not required by the State to assess compliance for public health. The States however, need these data for their program records and implementation. In response to these comments, EPA is not requiring the State to report the data, but is requiring the PWS to report the data electronically to EPA, unless otherwise arranged, with a copy to the State. EPA will issue guidance on the process of reporting to EPA electronically or in other formats and providing a copy of the results to the State. Since EPA is paying for small systems' testing and reporting, the Agency will set up an electronic reporting system for these systems that are required to report. EPA will report the data to the States for these small systems. EPA will hold the data of small and large systems for 60 days to allow systems and States to review the data before placing the data in the NCOD, as required by SDWA. EPA encourages States to review the data as time allows because their review is critical to identifying drinking water quality issues that may not be obvious at the national level. This review provides an additional level of data quality control before EPA uses the data in regulatory decisions.

3. Timing of Reporting

In response to public comments from States and systems requesting more time to report these data, EPA modified the rule at § 141.35(c) to require large PWSs to report their monitoring results within thirty days, rather than ten days, after the month in which they receive the results from the laboratory. This requirement provides additional time for systems to review the UCMR results before reporting them to EPA.

4. Method of Reporting

SDWA Section 1445 (a)(2)(D) states that each PWS that monitors for unregulated contaminants must provide the monitoring results to the primacy authority for the system. Today's final rule requires electronic reporting by PWSs to EPA, while providing a copy of the results to the State (§ 141.35(e)). The rule also allows EPA to specify another method for reporting by a PWS, if necessary. Public commenters supported allowing an alternate reporting method for PWSs if they could not report electronically. Note that EPA will pay for the testing and laboratory analysis of samples for small systems in State Monitoring Plans. Since EPA plans to establish electronic recordkeeping of the results from systems in State Plans, electronic reporting for these systems will be done through the assistance of EPA. EPA might consider specifying another method for reporting when a system serving over 10,000 persons has not developed the capability to report electronic results. However, most laboratories have this capability and could probably provide this service for the PWS.

5. Public Notification of Availability of Results

SDWA Section 1445 (a)(2)(E) requires notification of the results of the UCMR program to be made available to persons served by the system. The results of UCMR monitoring for CWSs will be reported through annual Consumer Confidence Reports (CCR), as required by § 141.153 (d). For NTNCWSs, UCMR monitoring results will be reported according to requirements of the revised public notification rule as proposed May 13, 1999 at 64 FR 25963. Failure to monitor for unregulated contaminants required through the UCMR will also be reportable under the public notification rule.

The results that will be reported through the CCR and public notification rules should be based on the same monitoring data that the States will receive under the UCMR and will be required to be reported to the NCOD. Information in the NCOD will be available to the public.

VII. Section-by-Section Analysis of Public Comment and EPA Response

This portion of the preamble is devoted to highlighting major changes in the specific sections and paragraphs of the revisions to the Unregulated Contaminant Monitoring Regulation, including 40 CFR 141.35, 141.40, 142.15(c), and 142.16, in the order that they appear in the Code of Federal

Regulations and are promulgated here as a final rule today. The details of the peer review and public comments and EPA's responses can be found in two background documents: External Peer Reviews of the Unregulated Contaminant Monitoring Regulation, and Public Comment and Response Summary for the Unregulated Contaminant Monitoring Regulation.

A. Section 141.35—Reporting of Unregulated Contaminant Monitoring Results

1. Does this reporting apply to me?

This paragraph notes that § 141.35 applies to the owner or operator of any PWS required to monitor for unregulated contaminants under § 141.40. Exceptions to the reporting requirements are also noted. The majority of comments received on this topic suggested that water systems using purchased water should be required to monitor for contaminants occurring in distribution lines, such as microbiological contaminants. Like the proposed rule, today's final rule states that small systems serving 10,000 or fewer persons need not report their results to EPA because EPA will pay and arrange for testing and reporting of the results. To improve the logical flow of the rule, EPA moved this exception to this paragraph from the paragraph immediately below it.

In response to these comments, EPA has modified this section, noting that water systems that purchase all of their water will be included in the UCMR for contaminants having distribution system sampling points, including points of maximum residence time or points of lowest disinfectant residual.

A few commenters suggested it was inappropriate for only the small systems selected as part of the national representative sample to report UCMR results and not other small systems. In response, EPA notes that Section 1445(a)(2)(D) of the SDWA states that all systems required to conduct unregulated contaminant monitoring must report the results. Because only a nationally representative sample of small systems will be required to monitor under the UCMR, only those systems will have to report the results.

2. To whom must I report?

This section explains the reporting requirements for systems that will monitor for unregulated contaminants.

Under today's rule, a system must report the results of unregulated contaminant monitoring to EPA and provide a copy to the State. This is a change from the proposal and is based on EPA's decision, in response to public comment, to implement this rule through MOAs with State agencies rather than through the primacy process. EPA will hold the data for 60 days to allow systems and States time to conduct a quality control review before entering the data into the NCOD. This is discussed in more detail in IX.A. Implementation of the Rule. The system also must notify the public of the monitoring results as provided in Subpart O (Consumer Confidence Reports) and proposed Subpart Q (Public Notification) of this part.

Even though small systems do not report their results because EPA will do that for them, small systems must still comply with the public notification requirements for these results.

3. When do I report monitoring results?

This section specifies that a PWS must report the results of unregulated contaminant monitoring within thirty days following the month in which they receive the results from the laboratory.

Today's final rule is slightly different from that of the proposed rule. Rather than reporting within 10 days of receiving monitoring results, it extends the deadline for reporting results to thirty days after the month in which the results are received from the laboratory. This change provides more time for the system to review the data before reporting. This is in response to comments received indicating that the requirement that systems report results within 10 days after receiving results from the laboratory is too short a period. Additionally, commenters were concerned with adequate time to review and understand the data before reporting them to EPA. Also, as noted previously, EPA will wait 60 days before placing the data in the National Drinking Water Contaminant Occurrence Database (NCOD) to allow additional time for systems, States and EPA to ensure quality control of the data.

Consistent with the decision to not require States to adopt this rule as part of primacy, EPA has also clarified that EPA, not the State primacy agency, will specify the required monitoring period.

A commenter was concerned with the costs associated with reporting UCMR results quarterly and requested that PWSs be allowed to report data in an annual batch. EPA is maintaining the requirement of quarterly reporting because EPA does not believe that annual reporting would allow EPA to use the data as input to the next round of the CCL and UCMR lists, which is a principal objective of the rule. Also, large PWSs already report quarterly. Additionally, EPA plans to evaluate the data early to determine whether modifications are needed in the analytical methods.

4. What information must I report?

This section lists and defines the data elements that must be reported. In addition to analytical results and quality control, EPA is requiring information on the PWS from which the analyzed sample was taken.

Today's rule modifies somewhat the unregulated contaminant monitoring reporting requirements in the proposed rule (Table 8 of "Revisions to the Unregulated Contaminant Monitoring Regulation for Public Water Systems," **Federal Register**, vol. 64, no. 83, April 30, 1999, pages 23426 to 23428) and reorders the sample data elements. For example, for microbiological monitoring, future requirements may specify either a sampling point in the distribution system that has the maximum residence time or, under today's rule, the lowest disinfectant residual, in response to comments concerning systems using disinfectant booster stations where the disinfectant residual is low. These sampling point types were added to the data element listing. Questions were raised as to how the UCMR would accommodate water systems that have mixed sources (i.e., use blended/mixed surface water and ground water). In response, the data element, Water Source Type, will be modified in the Safe Drinking Water Information System (SDWIS) Inventory Reporting Requirements to address this issue: the valid choices for this data element will include purchased/non-purchased blended/mixed water. See 40 CFR 141.35(d) Table 1 of the rule for more information.

Sample collection date must be reported as 4-digit year, 2-digit month, and 2-digit day under the final rule to ensure year 2000 compliance, and to refine date records, as suggested by peer reviewers. Also added to the sample data elements is a sample batch identification number, which is assigned by the laboratory to each batch of samples analyzed with the spike and spike duplicate sample at the spiking concentration to allow analysis of method performance. The list of permitted sample analysis types is reduced to field sample and batch spike/spike duplicate since these will be the only required sample types reported for unregulated contaminant monitoring.

During the public comment period, a comment was received suggesting that inventory data elements should be provided officially by the States through

the inventory data reporting process, rather than by systems with their sample results. EPA agrees that inventory data elements are already reported by a different mechanism. Therefore, EPA has removed the data elements that are or will be included in the Safe Drinking Water Information System (SDWIS) Inventory Reporting Requirements: sampling point type, water source type, public water system facility type, latitude of the public water system facility for source and treatment plant, and longitude of the public water system facility for source and treatment plant. This change in data elements under today's rule provides for the revision or addition in inventory data reporting for the data elements not included in the rule to address:

(A) for sampling point type, an expansion of allowable choices to include: raw/untreated water, finished water from treatment system, finished/treated water from entry point to the distribution system after treatment, finished/treated water from within the distribution system, finished/treated water from the distribution system at the location of maximum residence time or lowest disinfectant residual, finished/treated water from the distribution system at the location of lowest disinfectant residual, finished/treated water from household/drinking water tap, finished/treated water from unknown location, and other finished/treated water;

(B) for water source type, to include allowable choices of: surface water from a stream or purchased surface water from a stream, surface water from a lake or reservoir, or purchased surface water from a lake or reservoir, ground water under the direct influence of surface water or purchased ground water under the direct influence of surface water, ground water or purchased ground water, and blended/mixed surface water and ground water, or purchased blended/mixed surface water and ground water;

(C) for public water system facility type, to include, for the purposes of UCMR, the allowable choices of: intake (for surface water sources), well or wellfield (for ground water sources), treatment plant, sampling point, entry point to distribution system, reservoir, booster station, and unknown;

(D) latitude of the public water system facility for source and treatment plant; and

(E) longitude of the public water system facility for source and treatment plant. Additionally, the SDWIS inventory reporting requirements will address associating the PWS facility identification number of any sampling point with the PWS facility identification number of its respective treatment plant. Furthermore, the reason that the latitude and longitude of the treatment plant should be reported is to allow the association of other data, such as health effects information, with a point closest to the affected population, since the ultimate use of the UCMR data is for input to exposure assessment in determining whether or not to regulate a contaminant.

Comments were received suggesting that EPA include the maximum reporting level (MRL) in the data elements. It is not necessary to include the MRL in the data elements because the MRL is specified in the rule in § 141.40(a)(3) Table 1. The rule wording is clarified so that a particular laboratory having the capability for reliable lower detection may report concentrations below the MRL.

Some commenters had concerns about the inclusion of a presence/absence data element. For microbiological contaminants, this data element may be needed because analytical methods do not always allow for quantification of the target organism in the sample and may only allow for a qualitative response, i.e., presence or absence. For chemical contaminants it can be used for reporting the detection of chemical contaminants below the MRL but above the MDL.

5. How must I report this information?

This section explains that the unregulated contaminant monitoring results must be reported in electronic or in another format specified by EPA, such as a template on paper that can be scanned and entered into the NCOD electronically.

A question was raised as to how EPA will be able to accept electronic data from diverse laboratory information systems at the many laboratories that may be reporting data. It was also suggested that EPA work with States and water suppliers to develop formats to make electronic submission easier. EPA is considering the development of software that may be downloaded from the EPA website to enable systems and their laboratories to electronically report data. This may be the same electronic data form that allows PWSs to report data to NCOD/SDWIS.

Some commenters indicated that the State should have the option to specify an alternate reporting method, particularly with respect to small systems. It was also suggested that EPA should write the rule so as not to preclude reporting directly to States and EPA from the laboratories for small systems, as well as for large systems. The laboratory, whether EPA-approved or an EPA-designated (i.e., contract) laboratory, could report to systems, States, and EPA. As noted previously, EPA will report the data for small systems.

As noted, the final rule is modified to require systems to report to EPA. EPA will require electronic reporting, unless some other format must be used for a particular system. This situation may be established in consultation with the State and described in subsequent guidance that EPA will prepare on the UCMR reporting process.

One commenter also expressed the need for an electronic legal equivalency of a signed hard copy of a laboratory report. Since there is no requirement for electronic reporting of a signed laboratory report, EPA will not require an electronic legal equivalency. Systems may want a signed hard copy for their own records.

6. Can the laboratory to which I send samples report the results for me?

This section states that a laboratory can report the sample results, so long as it provides the system with a copy for review and record keeping.

The Agency was asked to clarify that it is the responsibility of the PWS owner/operator to report data to EPA, even if the laboratory reports the results. In response to comments, the rule wording has been clarified to stress that the PWS is responsible for reporting information and ensuring that the laboratory provides the results to EPA and the State.

7. Can I report previously collected data to meet the testing and reporting requirements for the contaminants in § 141.40(a)(3)?

This paragraph was added in response to many comments received requesting a provision for systems to report relevant unregulated contaminant data collected before implementation of today's rule, in lieu of allowing only UCMR data collected after the rule's effective date. The general consensus was that some large systems may already have monitored for or want to monitor before 2001 for these contaminants, especially if it fits within their monitoring cycle. This paragraph specifies that, as long as systems meet the requirements specified in § 141.40(a)(3), (4), (5) and Appendix A for monitoring and in § 141.35 (d) for reporting, the data collected before the effective date of this rule can be submitted to meet the testing and reporting requirements for the contaminants in § 141.40(a)(3).

B. Section 141.40—Monitoring Requirements for Unregulated Contaminants

1. Requirements for Owners and Operators of Public Water Systems

(a) Do I have to monitor for unregulated contaminants?

This section eliminates unregulated contaminant monitoring requirements for owners and operators of transient, non-community water systems. It also specifies the monitoring requirements for large systems that do and do not purchase their entire water supply from another system and for small systems selected for the program that do and do not purchase their entire water supply from other systems.

Today's rule describes specific monitoring requirements for large and small systems that purchase their entire water supply from other systems. This is in response to the many commenters who indicated that PWSs using purchased water should be included in the UCMR for microbiological contaminants, or other contaminants that may arise in the distribution system. As a result, EPA modified the rule to require that water systems that purchase all of their water will be included in the UCMR for contaminants having distribution system sampling points.

(b) How would I be selected for the monitoring under the State Monitoring Plan, the screening survey, or the pre-screen testing?

This section is basically unchanged from the proposed rule since commenters broadly supported the 3-tier approach to the monitoring program. It explains that only a representative sample of small systems, randomly selected by EPA, will be required to conduct assessment monitoring for unregulated contaminants as part of a State Monitoring Plan. A subset of these systems will be randomly selected as Index systems and required to submit additional information. Each State will have the opportunity to modify the list of selected systems.

(c) For which contaminants must I monitor?

The Unregulated Contaminant Monitoring List is presented in this section. It comprises List 1, the chemical contaminants to be monitored under Assessment Monitoring; List 2, the chemical and microbiological contaminants to be monitored under the Screening Survey; and List 3, the chemical and microbiological contaminants to be monitored under Pre-Screen Testing.

In response to many comments, today's rule makes changes in the contaminant lists as presented in the proposed rule. For List 1, the chemicals perchlorate and acetochlor are added and the microbiological contaminant *Aeromonas* is removed and moved to List 2. The analytical methods for perchlorate and acetochlor are reserved. The methods are expected to be ready in the near future, at which time, a rule revision will be published for comment and promulgated to ensure these contaminants can be monitored on or before January 2001. Nitrobenzene, also on List 1, has an approved method, but it requires careful implementation. Acetochlor (now on List 1) is removed from List 2, and RDX and the radionuclide polonium-210 are added to List 2. The sampling locations for List 1 and 2 contaminants are Entry Points to the Distribution System (EPTDS), except for *Aeromonas* and polonium-210, for which the sampling points are reserved until the methods are further validated and promulgated. The radionuclide lead-210 is added to List 3. Sampling locations for the radionuclides and microogranisms are reserved, as are the dates for the period during which monitoring must be completed. These dates will be determined at a later time. To activate monitoring for the contaminants on Lists 2 and 3, the methods and related sampling requirements must be specified in future rulemaking revising this regulation.

Many commenters indicated that it would be premature to include *Aeromonas* on List 1 since the specified method has not been sufficiently field tested. It was also suggested that the rule should be clear about its focus on *Aeromonas* the genus, not the species *A. hydrophila*.

In response, EPA has moved Aeromonas to List 2. The CCL specifies *Aeromonas hydrophila*; however, the proposed analytical method identifies to the level of the *Aeromonas hydrophila* complex, which is a group of about 7 to 12 *Aeromonas* species. To identify to the species level would increase the cost and complexity of the analysis and, given funding considerations, would limit the size of the *Aeromonas* monitoring program that could be done. Given the cost of the analyses and how frequently *Aeromonas* has been found in previous finished water surveys, a panel of EPA scientists (CCL Microbiology Meeting, Cincinnati, OH, July 9, 1998) agreed that identifying to the *Aeromonas hydrophila* complex (rather than the species) level was adequate for the purpose of the UCMR. A final method has not yet been written for *Aeromonas*. The current draft analytical method for *Aeromonas*, draft EPA Method 1602, does not include verification tests since a final decision on the inclusion of verification tests into the method will be made after method validation studies. Since the method validation studies have not been completed, EPA has placed *Aeromonas* on List 2, to be monitored after the method is ready.

In response to over 100 public comments and peer review considerations addressing the inclusion of perchlorate in the UCMR, EPA has added it to List 1. EPA did not originally propose monitoring for perchlorate under this portion of the regulation based on three general concerns: its apparent local/regional, rather than nationwide, occurrence at the time EPA assembled the monitoring list; current analytical methods do not adequately address potential interferences from chloride, sulfate or other dissolved solids; and no laboratories are certified for performing analyses using the methods for perchlorate. Based on many comments that showed perchlorate occurrence in many locations around the nation, EPA placed perchlorate on List 1. The analytical method for perchlorate is listed as "reserved" in the UCMR pending imminent conclusion of EPA refinement and review of the analytical method. Since EPA did not initially include a perchlorate analytical method in the proposal to this regulation, it will be necessary for EPA to issue an additional regulation to formally propose and promulgate a perchlorate analytical method prior to initiating monitoring for perchlorate under the UCMR.

Therefore, following promulgation of the UCMR (including the "reserved" perchlorate method reference), EPA will be proposing a new regulation specifying both the approved analytical method for the analyses of perchlorate, and the implementation of a laboratory approval system, where labs are certified to test for perchlorate. EPA is currently conducting analytical methods development to support the analyses of perchlorate. This new method will be based on the currently available ion chromatography methods, but will include a criteria detailing when a laboratory must perform a sample clean-up procedure to minimize the impact of elevated concentrations of chloride, sulfate or other dissolved solids. The laboratory approval system will be based upon previous certification of the laboratory for the analyses of compliance monitoring samples using

either EPA Method 300.0 or 300.1, and the successful analyses of a perchlorate performance evaluation sample.

EPA asked for comment on and a few commenters recommended the addition of RDX (hexahydro-1,3,5-trinitro-1,3,5-triazine) to the UCMR. In response, EPA has placed RDX on List 2, as its method needs further refinement. EPA will propose and promulgate an analytical method for RDX prior to requiring monitoring for RDX under the UCMR.

EPA also received comments suggesting that it move acetochlor, 2,4-dichlorophenol and 2,4,6-trichlorophenol from List 2 to List 1, and require systems to use EPA Method 525.2 to analyze for acetochlor and either a new SPE/GC/MS method modified for EPA Method 525.2 or a modified EPA Method 552 to analyze for the phenols. EPA has moved acetochlor to List 1, since the analysis of acetochlor using EPA Method 525.2 is expected to be approved prior to UCMR implementation. The evaluation of the use of EPA Method 525.2 will be finalized after acetochlor preservation studies have been completed. EPA will propose and promulgate an analytical method, likely EPA Method 525.2, for acetochlor prior to requiring monitoring for acetochlor under the UCMR.

EPA did not move 2,4-dichlorophenol and 2,4,6-trichlorophenol to List 1 since the progress of method development for these contaminants is not equivalent to that of acetochlor. EPA has determined that the phenols are not compatible with EPA Method 525.2 and expects to require a separate SPE/GC/MS method currently under development. A modification to EPA Method 552 was also suggested. The suggested diazomethane modification to EPA Method 552 is not an option permitted in Method 552 as an EPA approved method and must be evaluated, reviewed and approved before allowing it to be used as an EPA method.

As noted in this comment, dichlorophenol and 2,4,6-trichlorophenol can only be analyzed using method 552, when the diazomethane used is sufficiently strong. This does not lead to the type of reproducibility needed to approve this method in a variety of analytical laboratories that may produce diazomethane of varying strengths. If the diazomethane is not as strong as that indicated in this comment, the recovery of dichlorophenol can drop to 10%. In addition, 2,4,6-trichlorophenol is subject to interferences caused by the derivatization product of 2,4-dichlorophenol, regardless of the strength of the diazomethane. Method 552 is not approved for the analyses of any other UCMR analytes. Therefore, use of Method 552 for these 2 compounds would then require the laboratory to use a separate method for the analyses of the other phenols included in the UCMR. Instead of requiring 2 methods for these analyses, EPA is currently conducting the method development necessary to provide a solid phase extraction GC/MS method, that does not require derivatization, for the analyses of all of the phenols included in the UCMR as well as other phenols not currently listed. This will provide a single solid phase extraction, GC/MS method for the analyses of all of the phenols included in the UCMR. Therefore, 2,4-dichlorophenol and 2,4,6-trichlorophenol will remain on List 2.

As suggested by several commenters, EPA has added polonium-210 and lead-210 to the UCMR Lists. New information indicates that methods for these contaminants may be easier to conduct than originally envisioned. However, EPA research and an external expert reviewer with experience with radionuclides note that the currently available methods for lead-210 and polonium-210 may be very time consuming and will require an experienced analyst. There are also significant laboratory capacity and capability concerns. Few, if any, laboratories currently performing compliance drinking water radiochemistry have any experience with polonium-210 or particularly lead-210. The method for lead-210, in particular, needs further refinement. Therefore, EPA has added polonium-210 to List 2 and lead-210 to List 3. Before requiring monitoring for these contaminants, EPA will need to address issues related to radionuclide laboratory capacity and certification.

The recommendation was also made that the Agency add EPA Method 502.2 for the measurement of MTBE. Several public comments suggested that EPA Method 502.2 was reliable, and that if it is not added, then there could be added burden on PWSs using GC methods. EPA considered the commenters concerns; however, the Agency is not allowing the use of EPA Method 502.2 for MTBE. MTBE is not included in EPA Method 502.2 because MTBE cannot be reliably measured by either of the detectors used in the method, and its stability has not been tested using the preservatives listed in that method.

Some commenters also suggested the use of EPA 525.2 for nitrobenzene since they have problems using the methods listed in this regulation. Nitrobenzene will remain on List 1 with EPA Method 524.2, and voluntary consensus standard methods D5790-95 and SM6210D being approved for its analysis. However, the commenters are correct that some laboratories have had problems measuring nitrobenzene using these methods. When laboratories do not use the three stage trap listed in the method, nitrobenzene cannot be detected at reasonable concentrations in either standards or samples. Since they will therefore clearly fail the quality control requirements of the method, data will only be generated by laboratories that can provide useful data based on full method implementation. While the data provided by a commenter and confirmed by current EPA methods development research demonstrate that nitrobenzene can be analyzed using EPA Method 525.2, the preservation of nitrobenzene using Method 525.2 conditions has not been demonstrated. The methods development research needed to determine that nitrobenzene can be preserved using the sampling procedures specified in EPA Method 525.2 is currently being conducted. If nitrobenzene is compatible with this method's preservation requirements, then EPA will propose and promulgate an analytical method for nitrobenzene prior to requiring monitoring for nitrobenzene.

As for the use of EPA Method 525.2 for the analyses of nitrobenzene, research recently conducted in the OGWDW laboratory clearly indicated that nitrobenzene cannot be accurately analyzed using Method 525.2. Recoveries of nitrobenzene were less then 10% when samples were extracted using the conditions specified in method 525.2. In conversations with the laboratory submitting this comment, EPA was informed that the data submitted in this comment was not developed using the procedures specified in EPA Method 525.2. In addition, no analyte stability data is available for the storage of nitrobenzene in samples preserved as specified in method 525.2 or in extracts generated using method 525.2. Therefore, EPA Method 525.2 will not be approved for the analyses of nitrobenzene.

One commenter suggested that EPA Method 632 is a simple method with adequate sensitivity for measuring diuron and linuron. EPA Method 632 is a modification of the National Pesticide Survey Method 4, which EPA has found is not reliable for diuron and linuron.

One commenter requested that an HPLC method that can measure each of the two DCPA acid degradates separately be approved for their analyses. However, this method was published in a journal not by EPA or

any of the consensus methods organizations. This method, to the best of EPA's knowledge, is only being used in a limited number of laboratories and therefore has not had the level of validation necessary for use in this type of occurrence data gathering effort. In addition, since the methods that were approved measure the two DCPA degradates as a single analyte, approving a method that measures them differently would cause concern about data reporting and interpretation.

(d) What general monitoring requirements must I follow for List 1 monitoring?

This section specifies what is generally required of all systems participating in Assessment Monitoring. It also details additional monitoring requirements unique to large and to small systems.

Several commenters expressed support for collecting routine water quality parameters (WQPs) and agreed that WQPs provide useful information and a solid framework within which to explain and understand monitoring results, especially for microbiological contaminants. Several did not believe that reporting or testing of WQPs is necessary, noting that WQPs are not routinely collected for all systems, and expressing particular concern that small ground water systems without treatment do not collect information on chlorine residuals.

Water quality parameters are important for microbiological contaminants and may affect degradation of chemical contaminants. However, EPA is limiting the set of additional parameters, in response to comments. EPA is requiring reporting of additional parameters, as appropriate to the contaminant type, including pH, turbidity, temperature, and free and total disinfectant residuals. In addition, today's rule specifies the contaminant type and EPA Method, Standard Method, or other voluntary consensus standard that may be used to measure these parameters. Small ground water systems that do not disinfect would have no residuals to measure or report, so this will not be a burden. Furthermore, for small systems serving 10,000 or fewer persons, EPA will pay for the testing of these water quality parameters as part of the testing program for unregulated contaminants.

The monitoring requirements for large systems remain unchanged from the proposed rule. Text covering small systems has been clarified (1) to indicate that the State may inform small systems of sampling arrangements other than those listed in this section, (2) that EPA-designated laboratories will provide sampling equipment, and (3) the EPA will specify sample collection times.

It was suggested that the Agency use total trihalomethane (TTHM) monitoring sites for the microbiological contaminants. In general, commenters requested that more explicit designations be given for microbiological sampling sites. EPA has noted that it expects that system specific sites of normal and maximum residence time and normal and lowest chlorine residual will be designated when revisions to this final rule are made for contaminants of concern in distribution systems. These sites have been designated for other rules, related to total coliform and total trihalomethane/disinfectant byproduct sampling. Further, EPA will propose and promulgate appropriate monitoring sites for microbiological contaminants prior to requiring monitoring for *Aeromonas* and other contaminants of interest in distribution systems. The TTHM monitoring sites may be appropriate and, if so, will be included in the future rulemaking.

(e) What specific sampling and quality control requirements must I follow for monitoring of List 1 contaminants?

This section details the requirements for all systems, including sample collection, shipping time and reviewing and reporting results. It also prohibits compositing samples. Also provided in this section are requirements unique to large and small PWSs that are part of the State Monitoring Plan.

Today's text has been clarified to indicate that the State or EPA may inform all systems of sampling arrangements other than those specified in the rule. Other changes from the proposed rule related to large systems include clarifications on the frequency of sampling for chemical and microbiological contaminants conducted by surface water and ground water systems, as well as expanded information on sampling locations.

Regarding small systems that are part of a State Monitoring Plan, today's rule notes that the State or EPA may inform the system of sampling arrangements other than those specified in the proposed rule. It also notes that EPA's laboratory will send additional instructions for sampling if the first sampling event was not properly conducted.

(i) All systems

Overall requirements for all systems relative to (A) sample collection and shipping time, (B) no compositing of samples, and (C) review and reporting of results were not changed from the proposed to final rule.

(ii) Large systems

Specific sampling requirements for large systems are in this section.

(A) Timeframe

One commenter indicated that EPA should adapt the UCMR process to the 3-year compliance monitoring cycle. The rule already states that coordination with the 3-year compliance monitoring cycle is appropriate.

(B) Frequency

Many commenters were concerned that requiring ground water samples 6 months apart was not flexible enough to accommodate other monitoring schedules. Several commenters also suggested that systems using groundwater only be required to collect one sample per year because ground water systems do not vary much in water quality.

EPA has modified the rule to provide flexibility to the system to pick one of the three months in the vulnerable time and then one of three months 5 to 7 months earlier or later than the vulnerable time. This schedule should preserve the longer time between ground water samples desired for calculating an average annual concentration for exposure assessment.

EPA will maintain the two samples for ground water systems. Ground water systems encompass a wide range of conditions and many utilize unconfined settings that do exhibit temporal variability. To assess exposure from a one-year sampling activity, most experts EPA consulted and most stakeholders agreed that the program must try to capture the range of contaminant concentrations that occur to ensure representativeness of the results over time nationally. Two samples are the minimum to estimate an average exposure; one sample will be targeted toward the season of elevated concentrations (the vulnerable monitoring time). Many experts and reviewers suggested more frequent sampling, but the current design was deemed a reasonable compromise between data needs and burden. The UCMR frequency adds one additional sample over five years for a ground water site, not one every year. While some systems may not exhibit much variability, and some deep systems may not exhibit any synthetic contaminants, the UCMR must include the full range of water system conditions to develop an accurate estimate of national occurrence and exposure. Additionally, with the UCMR monitoring being

coordinated with compliance monitoring (to the extent possible), approximately one-third of systems affected by the rule will monitor each year. Therefore, UCMR Assessment Monitoring is expected to be conducted over a range of hydrologic patterns.

This wide range of ground water conditions also effects the nature of vulnerable periods. Some ground water systems show clear seasonal patterns, some show different scale of variability, and some show no variations (for some types of contaminants). For these new contaminants, EPA set a default vulnerable period (May, June, or July) that would fit the majority of vulnerable seasonal patterns around the United States. Expert technical reviewers and stakeholders concurred with this period. However, the State can specify a different period, based on their knowledge of local conditions. EPA decided not to allow systems to establish vulnerable periods because of the need for national consistency to support a sound statistical approach. Allowing each system to establish a vulnerable time would introduce significant variability in the program implementation, contrary to the consistency basis of the statistical approach for an unbiased sample. EPA decided that flexibility at the State level to select an alternate vulnerable monitoring time was the maximum allowable variability that should be incorporated into the implementation of the program.

(C) Location

A few commenters suggested that EPA allow source water monitoring, particularly in States where source water monitoring is used as a more stringent location for compliance monitoring. In related comments, the Agency was asked to provide further information about entry points to the distribution system (EPTDS), particularly with respect to groundwater systems with multiple wellhead and/or using multiple aquifers, suggesting that representative samples might be collected instead of from every entry point.

The sampling location for chemical contaminants is given on List 1 as the EPTDS and is now further defined to include the compliance monitoring point specified by the State or EPA under 40 CFR Part 141. In implementing compliance monitoring, the States and EPA have made determinations of where representative samples are collected, and this rule will incorporate these determinations and be consistent with ongoing monitoring. However, if the compliance monitoring point specified by the State is a source (raw) water site, and a UCMR contaminant is detected, then sampling must be conducted at the EPTDS unless the State or EPA determines that no treatment or processing was in place that would affect the measurement of the contaminants. In that case, the additional sampling at the EPTDS would not be required.

(D) Sampling instructions

This section did not change and EPA did not receive any comments on it.

(E) Testing and analytical methods

Several commenters raised questions about the process for laboratory certification under the rule. As noted in the rule, laboratories are automatically certified for the analysis of UCMR chemicals if they are already certified to conduct compliance monitoring for a chemical included in the same method being approved for UCMR analysis. Since the Standard Methods, ASTM, and AOAC methods approved in the UCMR use the same technology as the EPA method listed for the same analyte, laboratories certified for compliance monitoring using the EPA method may also use any of these methods approved for the same analyte. As the method to be used for the analysis of perchlorate will be based upon the currently available single analyte methods for the analysis of perchlorate, EPA will need to conduct a performance evaluation study of labs to approve them for perchlorate monitoring before January 2001. Details of this approval system will be included in a public notice and comment period prior to conducting approval for perchlorate analysis.

(F) Sampling deviations

This section did not change and EPA did not receive any comments on it.

(G) Testing

This section did not change and EPA did not receive any comments on it.

(iii) Small systems that are part of the State Monitoring Plan

In the Preamble of the proposed rule, EPA asked for public comment on whether a random selection of small systems across the nation was appropriate for a representative sample of small systems or a targeted sampling approach based on prior information about contaminant occurrence or use should be applied. Most commenters, and particularly expert technical reviewers, addressing this issue supported the random selection of systems as an unbiased, scientifically sound approach.

EPA determined after consulting statisticians inside and outside EPA that a targeted approach would increase sampling errors unless the sample size is increased. A random sample is necessary to provide small system data roughly equivalent to large system data. Further stratification could introduce non-random sampling errors unless the sample size is increased. Targeted monitoring may also miss the target area if little is known about the actual location of use of a contaminant or if the contaminant is used beyond the specified target area. Additionally, surface waters will carry contaminants beyond the target area to surface water supplied drinking water systems downstream that need to be considered for UCMR monitoring. Also, targeting would be very difficult with the number of contaminants the UCMR is designed to measure. Finally, stratified sampling also requires extensive knowledge about a variety of factors beyond the fate and transport of a contaminant in the environment.

(A) Frequency

Comments and EPA response were addressed under (ii) Large Systems, above.

(B) Location

Comments and EPA response were addressed under (ii) Large Systems, above.

(C) Sampling deviations

State commenters asked about resampling if sampling errors occurred. EPA modified this paragraph to include provisions for resampling using additional instructions from the State or EPA.

(D) Sample kits

No comments were received on this section. It is unchanged.

(E) Sampling instructions

States indicated that some flexibility was needed within a month's timeframe to accommodate changes in sampling schedules that could not be accounted for up-front. In response, EPA changed the specifications. The State Plan will specify the year and day, plus or minus 2 weeks, to allow flexibility and/or to account for changes related to the State's determination of an alternate vulnerable sampling period. The State may pick another year and day to coincide with compliance monitoring.

(F) Duplicate samples

No comments were received on this section. It is unchanged.

(G) Sampling forms

No comments were received on this section. It is unchanged.

(H) Sample submission

At least ten States expressed concerns about the ability of small system owner/operators to properly collect samples for UCMR requirements, which would, therefore, affect the quality of the UCMR results. These States suggested that they could collect UCMR samples for systems in the State Monitoring Plans since, in most States, the number of small systems would be limited, and some of them already conduct compliance field sampling for small systems.

The rule allows for States to sample. States can address field sampling in their Memorandum of Agreement between the State and EPA. EPA would welcome the assistance of States in collecting samples from small systems to ensure high quality data for future decisions concerning whether or not to regulate unregulated contaminants.

(f) What additional requirements must I follow if my system is selected as an Index system?

This section explains that systems selected as Index systems must help EPA or the State identify appropriate sampling locations and provide information on the wells and intakes that are in use at the time of sampling, on well casing and screen depths (if known) for those wells, and the pumping rate of each well or intake at the time of sampling. However, EPA will provide field technical support to collect samples at index systems and assist the systems with compilation of this information, as well as reporting these data.

Comments were supportive and no substantive changes were made to this section.

(g) What must I do if my system is selected for the Screening Survey or Pre-Screen Testing?

This section explains what is required of large and small systems selected to participate in the Screening Survey or in Pre-Screen Testing. Today's rule notes that large systems must report test results to States and EPA. EPA will be developing guidance for this reporting process.

(h) What is a violation of this rule?

EPA added a new § 141.40(a)(8) that clarifies violations of this rule. This clarification will help public water systems understand the consequences of a failure to monitor. The changes state that any failure to monitor or report will be a monitoring or reporting violation.

2. Requirements for State and Tribal Participation

(a) How can I as the director of a State or Tribal drinking water program participate in unregulated contaminant monitoring, including the State Monitoring Plan for small systems, and the Screening Survey and Pre-Screen Testing of all systems?

Today's final rule incorporates a variety of changes from the proposed rule in response to public comments. Many comments were received requesting that EPA directly implement the UCMR, rather than require States to obtain primacy. In response to these comments, adoption of this rule is no longer a condition of maintaining PWS primacy. EPA will proceed with direct implementation. However, EPA recognizes the important role of the States in this program and has modified the rule to encourage States and EPA to enter into Memoranda of Agreement (MOA) to facilitate State participation and implementation. EPA also recognizes that, in the absence of the option for an MOA, the three-tier monitoring approach of the UCMR would require States to apply for primacy revisions under this program three separate times (separately for each of the three lists) over five years; moreover, the primacy application period extends beyond the start of monitoring for each of the three tiers. Through the MOA, EPA and the State may also address other aspects of this final rule's implementation, including compliance tracking and enforcement.

This section explains that the director of a State or Tribal drinking water program can complete an MOA with EPA that describes the State's or Tribe's activities in accepting or modifying the initial monitoring plan, determining an alternative vulnerable time for sampling, modifying the timing of monitoring, identifying sampling points for small systems, notifying large and small systems of their monitoring responsibilities, providing instructions to systems that are part of the State Monitoring Plan, and participating in the Screening Survey and Pre-Screen Testing.

Regarding the initial plan, EPA will specify the small systems, rather than just their number, and the year and day plus or minus two weeks—rather than the week, month, and year in the proposed rule—that each small system must monitor for List 1 contaminants. A State can request that a system which purchases all its water from another system, as clarified in today's rule, be removed from the initial monitoring list, except if it is required to monitor for contaminants in the distribution system.

Public comments also suggested that States be allowed to remove systems from the monitoring list for justifiable and compelling reasons. States may remove systems from the plan if the systems have closed, merged, or purchase all of their water from another system. However, in response to comments, purchased water systems may be selected to monitor contaminants in the distribution system, since purchased water systems tend to have locations furthest from the treatment plant. In these cases, they would be added to the plan as sampling points in the distribution system for the systems first selected. In a change from the proposed rule, States may now remove systems from the list for other reasons, subject to review by EPA, as long as the decision to remove systems from the list is not based on contaminant occurrence, non-occurrence, or potential vulnerability of a system to a contaminant. Not removing systems based on prior or presumed information about contaminants preserves the statistical principle of an unbiased sample.

A State must explain in the State Plan sent to EPA why it believes a system should be removed, but the final decision rests with EPA, as EPA is responsible for ensuring the integrity of the national representative sample.

Systems are expected to monitor between May 1 and July 31, as the default vulnerable period, but today's rule allows a State to determine if there is a different period when any of the small systems in the initial plan, or any of the large systems that must monitor, are more vulnerable to contamination. If so, a State must notify the affected systems of when they are to take samples. If a State changes the vulnerable time for monitoring, the rule now indicates, in response to comments, that the State should also consider that the effects on modifying the timing of monitoring. The States would notify EPA of their determination through the submission of their revised Plan to EPA.

The proposed rule required States to provide EPA with plans for notifying each PWS selected in the initial or modified monitoring plan of their responsibilities and to provide them with instructions for monitoring. Under today's rule, establishing the State role of informing systems of their responsibilities is part of the State-EPA MOA.

As was the case under the proposed rule, a State entering an MOA with EPA must provide instructions to systems that are part of the State Monitoring Plan implementation; EPA will provide guidance on the instructions. Today's final rule adds new language requiring a State to inform EPA at least 6 months before the first monitoring is to occur if the State plans to do the sampling or to make alternative arrangements for the sampling at systems in the plan. The State also must address the alternative monitoring arrangements in the MOA with EPA. These alternative monitoring arrangements could include the State sampling at small systems, a change from, but not precluded in, the proposed rule.

Today's rule enables States, through a State-EPA MOA, to participate in Screening Survey monitoring by small systems as well as large systems. To participate, a State must review its State Monitoring Plan to ensure that no systems have closed, merged, or purchase water from other systems (unless the system is to conduct microbiological monitoring) and then make any necessary changes. States also must notify selected systems of the Screening Survey requirements.

Under today's rule, States may participate in Pre-Screen Testing in two ways. First, within 60 days of receiving EPA's letter concerning the initiation of Pre-Screen Testing for specific contaminants, a participating State must identify between 5 and 25 systems determined to be representative of the systems most vulnerable to the List 3 contaminants. Second, if Pre-Screen Testing is part of the MOA, a State now must notify each selected system's owner or operator of the Pre-Screen Testing requirements.

Today's rule also notes that if a State decides not to prepare an MOA with EPA to develop the State Monitoring Plan for small systems, the initial plan provided by EPA will become the State Monitoring Plan for a State or Tribe. Under the proposed rule, the initial plan became the State plan if a State did not accept the initial plan or submit a request to EPA to modify the initial plan within 60 days.

A commenter raised concerns about whether Tribal systems would be selected in a random manner to avoid bias toward selecting vulnerable systems. EPA will select Tribal systems at random. The rule treats Tribal systems the same as other systems with equal probability of selection.

A commenter was concerned about who would inform systems of their responsibility to monitor. As noted above, the State still plays a critical role in the successful implementation of the program, including informing the systems. If the State elects not to enter into an MOA, EPA will inform systems of their responsibilities.

Several commenters asked whether States should review List 2 systems in the representative sample at a later date to check the status of the systems prior to the Screening Survey. A provision has been made for later State review of List 2 systems in the State Plan to check system status that may have changed since the initial review.

(b) What if I decide not to enter into an MOA?

This is a new section not included in the proposed rule, although it responds to the previous recognition in the proposed rule that a State may not desire to engage in the process of preparing a State Monitoring Plan. This section indicates that EPA will carry out the functions that the State could have conducted.

(c) Can I add contaminants to the Unregulated Contaminant Monitoring List?

This section explains how seven or more State governors can petition the EPA Administrator to add one or more contaminants to the Unregulated Contaminant Monitoring List.

Except for the numbering of this subsection, it is unchanged from the proposed rule.

(d) Can I waive monitoring requirements?

This section explains that monitoring requirements can be waived only with EPA approval and only under very limited conditions.

Except for the numbering of this subsection, it is unchanged from the proposed rule.

A few commenters inquired as to whether EPA would allow individual systems to be waived from monitoring. The statute only provides for State-wide waivers.

C. Appendix A—Quality Control Requirements for Testing All Samples Collected Under § 141.40

This appendix specifies the requirements that a system must follow to control the quality of samples collected and submitted under § 141.40. Areas covered are sample collection/preservation, method detection limit, calibration, reagent blank analysis, quality control sample, matrix spike and duplicate, internal standard calibration, method performance test, detection confirmation, and reporting.

In response to public comments, a few minor technical modifications have been made to the Appendix, modifying specifications for calibration, matrix spikes and matrix spike duplicates, and the number of significant digits specified for MRLs.

D. Section 142.15—Reports by States

Section 142.15(c)(3) is replaced in its entirety by the term "Reserved" in today's final regulation because States will not go through a primacy revision process but may be reviewing the data for quality control purposes before EPA places them in the NCOD. The wording in the proposed rule is, therefore, not included.

E. Section 142.16—Special Primacy Requirements

Section 142.16(e) is revised to delete references to § 141.40 that are no longer relevant.

VIII. General Issues From Public Comment and EPA Response

Several additional issues were raised during the technical peer review and public comment processes. They are summarized and addressed next.

A. Data Quality

One commenter indicated that data quality objectives should determine confidence bounds for occurrence and exposure estimates and that resulting DQOs should be maintained for all system sizes. Many data quality specifications, such as confidence levels for the representative sample, are presented in F., Representative sample of systems serving 10,000 persons or fewer. EPA will publish other Data Quality Objectives for the UCMR in the Quality Assurance Project Plan for the program.

Commenters indicated that EPA should give balanced attention to both false negatives and false positives in establishing analytical methods and quality control procedures for the contaminants on the UCMR List. The Agency has evaluated analytical methods developed by both EPA and other voluntary consensus standards organizations that publish analytical methods, such as Standard Methods and the American Society for Testing and Materials. The Agency has not approved analytical methods published only in analytical journals or methods that use techniques that cannot routinely be used by all drinking water analysis laboratories (e.g., acid, base/neutral fractionation, or packed column gas chromatography). Because control of "false negatives" is essential to the quality of the data collected under this

final regulation, documentation of the contaminants' stability under the sample and extract holding conditions specified in the analytical method were also evaluated.

B. EPA Funding for Small System Testing

Commenters were concerned about small system testing for which EPA is to pay the costs. They suggested that if there is reduced funding, then EPA should reduce the list, sampling frequency or number of systems sampled. EPA currently has sufficient funds for this rule. If for some reason, funds are reduced, EPA will consider a range of options to respond to this circumstance, but in all cases would ensure that the rule would not impose a significant economic impact on small entities.

C. Lab Certification

Commenters were concerned that EPA needs to identify steps and procedures necessary to maintain certification for unregulated contaminant analysis and clarify how States are to certify laboratories in time for implementation of the rule. EPA will maintain the process for laboratory certification as it is. The rule provides an automatic certification of laboratories that are certified for the same methods applied to at least one other contaminant. No separate certification is required under the current UCMR.

D. Research

Commenters indicated that EPA should commit research funds for Aeromonas and preservation process studies. EPA is developing a detailed research agenda with its Office of Research and Development in support of the contaminants on the CCL.

E. Regulation Format

Some State commenters indicated that they may not be able to incorporate this regulation by reference because it is in question-and-answer format. EPA is no longer requiring States to have primacy to implement the UCMR, so the States will not have to incorporate the UCMR into their regulations. However, States will still be able to participate in the State Monitoring Plan as specified in a Memorandum of Agreement between the State and EPA.

F. Voluntary Data Submittal

One commenter indicated that EPA should encourage voluntary source water data if standardized methods were utilized to substantiate treatment needs. EPA will pursue obtaining data from other reliable sources since additional data will help inform decision processes. Source water data are available from other agencies.

IX. Other Changes Related to the Regulation

A. Implementation of the Rule

Implementation issues addressed in today's final rule include setting an effective date, instituting a memorandum of agreement (MOA) process with interested States; establishing the laboratory testing program; continuing research on methods development; determining the representative national sample and associated State Plans; conducting the sampling, analysis, and reporting; and allowing previously collected monitoring data. The UCMR program, as revised by today's final rule, is illustrated in Figure 1, "Unregulated Contaminant Monitoring Approach." A critical part of this program is funding the testing of samples from the national representative sample of small systems.

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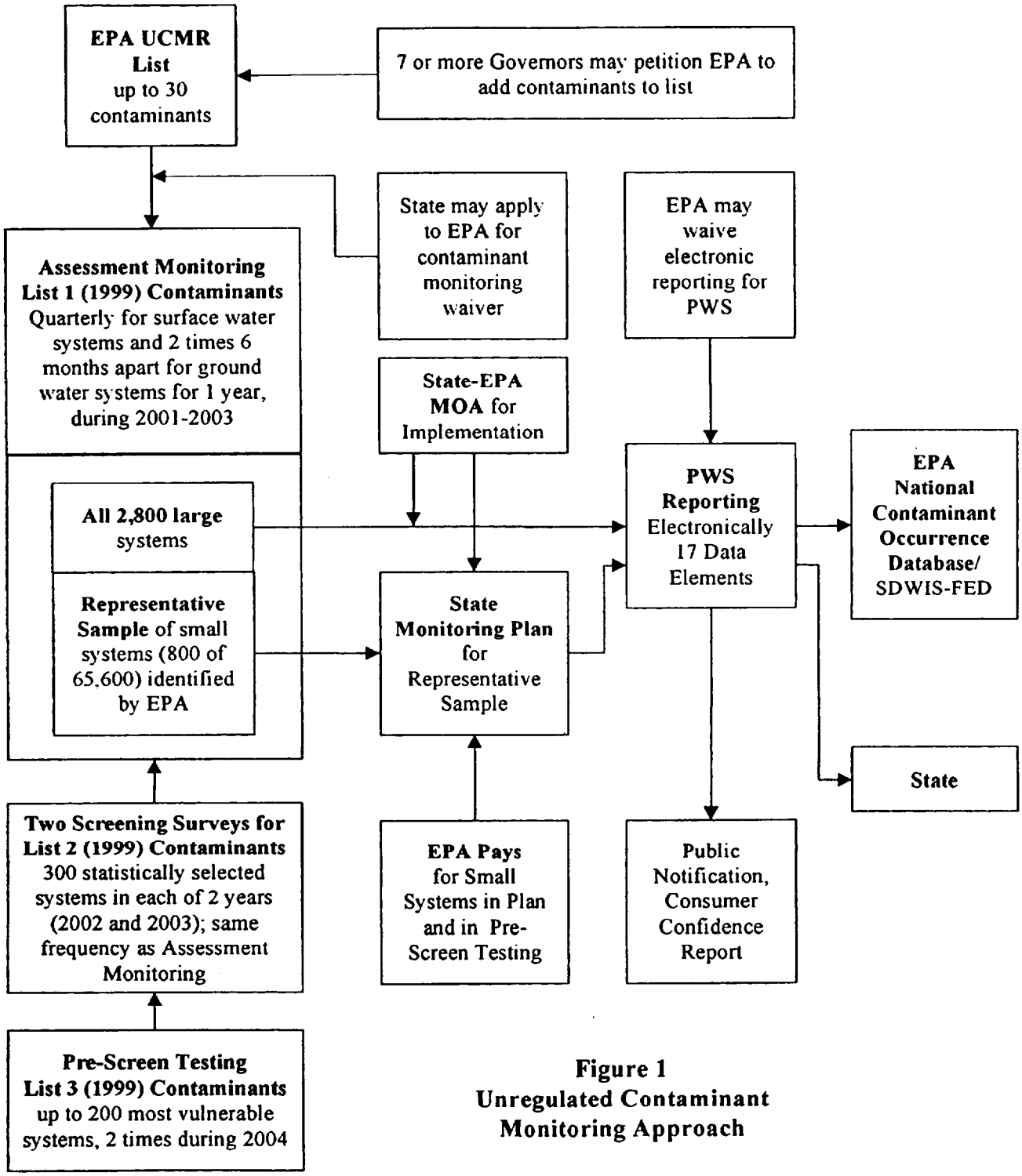

Figure 1
Unregulated Contaminant Monitoring Approach

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1. Setting an Effective Date

EPA has testing methods which are expected to give reliable and reproducible results for 10 of the contaminants on the UCMR Monitoring List to be tested for under Assessment Monitoring. These methods are widely used in the drinking water industry, although not necessarily for the listed contaminants. Testing for these contaminants, and other information about them, will help EPA determine whether to regulate them. Results of the UCMR testing should be available before the next revision of the CCL, in February 2003. Additionally, prior to initiation of the monitoring resulting from this rule, EPA must establish laboratory analysis contracts with laboratories that will do the testing and associated activities (including setting up a database and electronic reporting process) establish Memoranda of Agreement with States to implement the rule, and develop the national representative sample and send each State its allocation for review. Therefore, EPA has set January 1, 2001, as the effective date of the UCMR program, approximately16 months from the promulgation of this final rule. Shortly after this rule is promulgated, EPA will issue another rulemaking for public comment to add methods for perchlorate and acetochlor which were not previously on List 1. This action will allow these contaminants to be tested in 2001 and may allow data collected prior to the effective date to be used to meet the requirements of this final rule.

The 16-month period will enable States to enter into MOAs with EPA to provide support for the implementation of this final rule, to review the initial State Monitoring Plans, and to inform small PWSs of their selection and their responsibilities for monitoring. EPA will use this time to establish its laboratory program to test samples from small systems. Analytical methods are already in use for the contaminants to be tested for under Assessment Monitoring, so 16 months should be sufficient for laboratories that serve large systems to organize and implement the testing program, especially given the assistance provided by the methods and quality control manual. EPA is working to ensure that the manual and the contaminant occurrence reporting guidance documents are available to allow the program's implementation at that time. The requirements for small systems and the sampling and quality control procedures for all systems are specified in § 141.40(a)(3), (4), and (5) and in Appendix A. Figure 2 shows the timing of the major components and activities supporting the UCMR program.

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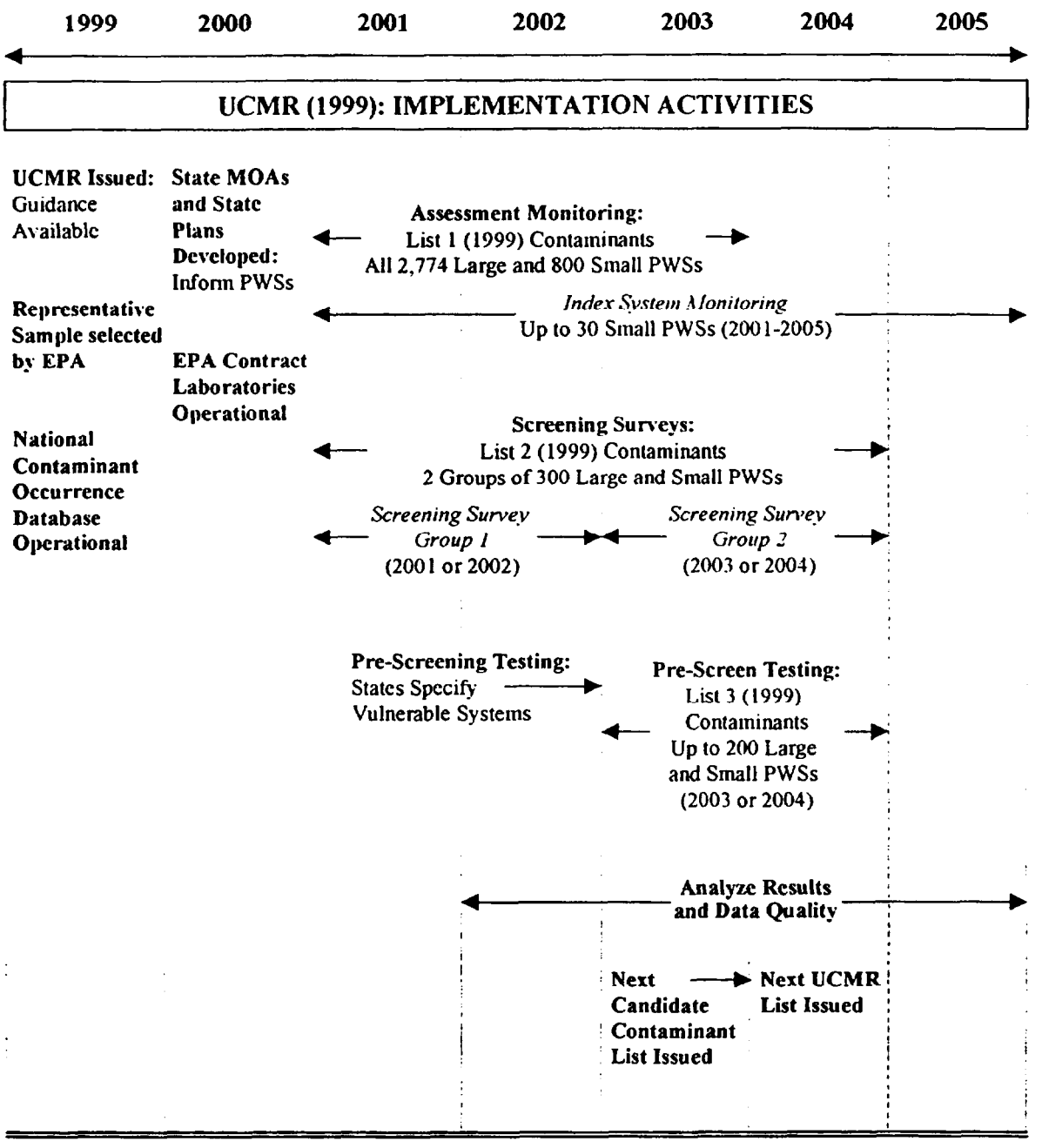

Figure 2
Implementation Timeline of UCMR (1999) and Related Activities

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2. Analytical Methods for the Testing Program

The required methods are identified in today's rule at § 141.40(a)(3), Table 1, "Assessment Monitoring." Additional sampling and quality control requirements can be found in § 141.40(a)(4) and (5) and in Appendix A. Large systems are required to follow the methods and procedures in § 141.40(a)(3), (4), (5) and Appendix A. Laboratories that test samples from small systems will also have to comply with § 141.40(a)(3), (4), (5), and Appendix A.

EPA has prepared guidance documents to help large systems organize and conduct their unregulated contaminant testing programs. The Agency's draft sampling guidance, "UCMR Guidance for Operators of Systems Serving 10,000 or Fewer Persons" provides details on sampling requirements. The Agency's "Unregulated Contaminant Monitoring Regulation Analytical Methods and Quality Control Manual" provides detailed guidance on specific method requirements related to the unregulated contaminants on the monitoring list and on quality control for all testing under this program.

3. Testing Program for Large Systems

Implementation of today's rule will result in Assessment Monitoring for List 1 contaminants only (including perchlorate and acetochlor, for which methods will be addressed in a separate rulemaking shortly). Analytical methods are in use for these contaminants, and EPA plans to review laboratories' procedures for their testing during Assessment Monitoring because of this program's stringent data-quality requirements.

The Agency anticipates that the contaminants on List 2, for the Screening Survey, may be monitored during the 5-year listing cycle through a separate rulemaking. EPA will select a statistically valid random sample of about 150 large systems to provide samples to a limited number of EPA-approved laboratories. The Agency's approval will depend on a variety of factors, including its evaluation of (1) laboratory capability, (2) test results of blind samples, (3) experience with similar methodologies, (4) willingness to accept samples from any PWS required to monitor under this regulation, and (5) provision of the testing for List 2 (and List 3) contaminants at a reasonable cost to large systems required to monitor.

Large systems selected for the Screening Survey (or Pre-Screen Testing for List 3 contaminants) will be notified by the State or EPA before the dates established for collecting and submitting samples to determine the presence of contaminants on List 2. For List 2 and 3 contaminants, large systems must send samples to laboratories approved by EPA.

4. Testing Program for Small Systems

Based on a competitive selection process, EPA will designate one to five laboratories that will test Assessment Monitoring samples from approximately 800 small systems in the State Monitoring Plans and, from the index systems, over the program's 5-year cycle. The laboratories will need to be able to provide all necessary sampling equipment to these systems, complete yet easy-to-follow instructions on the equipment's use, and appropriate sample preservation and testing services. They also will have to report electronically the test results to EPA and, in an alternate format specified by EPA if necessary, the PWSs, and provide a copy to the States, according to the reporting requirements of today's rule.

EPA will review and evaluate laboratory procedures to ensure that sufficient testing and data quality standards are met. Today's requirements and the final "UCMR Analytical Methods and Quality Control Manual" would be part of the testing contracts that EPA expects to sign with the selected laboratories.

Once a future rule is finalized to implement the Screening Survey for List 2 contaminants, EPA will select a statistically valid random sample of 150 small systems to provide samples during the two to three years in the middle of the 5-year cycle. The laboratories that test for List 1 contaminants for small systems will also test for contaminants on List 2.

5. Continued Development of Analytical Methods

EPA has yet to establish analytical methods for List 2 and List 3 contaminants that can be used widely and at reasonable cost. The Agency is establishing, through its Office of Research and Development, a research program to identify such methods. As analytical methods for the List 2 and List 3 contaminants are developed, EPA will propose and promulgate them as a revision to today's rule and solicit public comments on them. In addition to specifying the analytical methods to be used, these future revisions will establish sampling locations, minimum reporting levels applicable to the contaminants, and the dates sampling is to occur.

6. Determining the Representative National Sample and State Monitoring Plans

EPA requires only a representative sample of up to 800 small systems to monitor for the presence of unregulated contaminants in their drinking water. No later than 6 months prior to the start of Assessment Monitoring, EPA will identify, through a statistical selection process using a random number generator, up to 800 small systems (from approximately 65,600 community and non-transient non-community water systems) and at least 800 alternate systems in case replacements are needed. Each system will have an approximately equal chance of being selected based on its source water type (ground water or surface water) and size category (25 to 500, 501 to 3,300, or 3,301 to 10,000 persons served). EPA will notify each State, tribe, and territory of the selected systems or the systems themselves (i.e., the initial State Monitoring Plan) and the alternates within its jurisdiction.

Each State, tribe and territory can enter into a Memorandum of Agreement (MOA) with EPA to participate in the monitoring program, which will include development and implementation of the State Monitoring Plan. Each State, Tribe, and Territory will have 60 days to review its initial plan and (1) accept the plan as its State Monitoring Plan and inform EPA of that; (2) propose to EPA deletions from and additions to the initial plan, and explain the reasons for the changes, in order to create the State Monitoring Plan; or (3) choose not to participate in an MOA to develop the State Monitoring Plan, in which case, the initial plan sent to the State will become the final State Monitoring Plan.

A State, Tribe, or Territory that chooses option 1 or 2 must also inform EPA of how and when it will notify the selected systems of their responsibilities for monitoring, along with any necessary modifications to the timing of sampling related to vulnerable period determinations or to coordinate with compliance monitoring, at the State's discretion. A State may also choose an alternative "most vulnerable time" for its systems to sample if systems are most vulnerable to contamination by unregulated contaminants during a period other than May through July, as specified in today's rule. States that choose option 3 may still elect to notify the selected systems and provide the necessary information about their monitoring responsibilities as long as EPA is notified 6 months prior to the

first unregulated contaminant monitoring.

The systems randomly chosen by EPA to be index systems will also be specified in each State's initial plan. Any required replacements for the index systems will come from a list of randomly selected alternates included in the plan. EPA expects to provide, through the laboratories selected to test for unregulated contaminants, contractor support in collecting, shipping, and testing samples and in gathering additional information to support these index systems.

The Agency's procedures for selecting index systems is described in a technical document, "National Representative Sample and State Plans for Unregulated Contaminant Monitoring at Public Water Systems Serving 10,000 or Fewer Persons."

Although monitoring for List 2 contaminants is not required by today's rule, EPA will provide with the initial State Monitoring Plans a list of systems that would monitor for List 2 contaminants once a future rule implementing the Screening Survey is promulgated. The Agency will select randomly about 180 small systems and 120 large systems when it prepares the initial plans. States will review these systems at the same time they review their initial plans. EPA believes that the analytical methods for List 2 contaminants will be ready for use during the first 3 years of the 5-year listing cycle and that the Screening Survey will be undertaken during that period.

For the Pre-Screen Testing, each State may specify 5 to 25 systems that are representative of systems most vulnerable to the contaminants on List 3. EPA will determine the exact number of systems to be selected in each State based on the population served by community and non-transient non-community water systems. Each State must add to its monitoring plan any small systems selected for Pre-Screen Testing and will notify EPA of their addition.

7. Specifying the Vulnerable Monitoring Period

Each State may modify the vulnerable monitoring period specified in § 141.40(a)(5)(ii)(B) for a single system, a group of systems, or all systems selected to perform monitoring. In changing the vulnerable period, the State may consider environmental, precipitation, and system-specific factors. For small systems in the State Monitoring Plan, changes in the vulnerable time must be included in the Plan.

8. Conducting the Sampling

All selected systems must monitor for the unregulated contaminants on List 1 and should coordinate, at State discretion and to the extent practical, with their compliance monitoring schedule for regulated chemicals. For small systems in State Monitoring Plans, States may also select an alternative year and day, plus or minus two weeks, within the 3 year monitoring time frame for Assessment Monitoring as long as approximately one-third of the systems in the State Monitoring Plan monitor in each year of the 3 year period. Surface water-supplied systems must monitor for chemical contaminants every 3 months during a 12-month period, and ground water-supplied systems must monitor for them once approximately every 6 months during a 12-month period of every 5-year testing cycle beginning in the years indicated in column 6 of UCMR Table 1, List 1, § 141.40(a)(3). One sample must be taken at each post-treatment distribution system entry point or other representative sampling point designated by the State for compliance monitoring under 40 CFR 141.24(f) representing all principal, non-emergency water sources in use during the 12-month period, or at each distribution sampling point, during May to July unless the State identifies a period when one, some, or all of its systems are more vulnerable to contamination by List 1 chemicals.

For microbiological contaminants, a PWS must monitor at a site in the distribution system that represents the water supplied to the system's customers and at a site in the distribution system that has the maximum residence time or lowest disinfectant residual, depending on the contaminant. This also would apply to PWS that purchase their water supply from another system. One set of samples must be taken during the system's most vulnerable time, defined as May 1 through July 31 in today's final rule, or at a time designated by the State as the must vulnerable period, and another set of samples must be taken approximately 5–7 months before or after.

The 5-year unregulated contaminant listing cycle can be coordinated with the 3-year compliance monitoring schedule by starting the next 5-year monitoring round in January 2001 and taking UCM samples when compliance sampling is performed, regardless of where the 3-year cycle is in a particular State. Sampling in the rest of the State would occur during the next 2 years, following the State's compliance monitoring schedule. Even though a system is not sampled for regulated contaminants during the 5-year UCMR listing cycle, it may be required to monitor for unregulated contaminants during that time.

9. Establishing Sampling Points

Today's rule specifies that sampling must be done at entry points to the distribution system, or at sampling points designated by the State to be representative compliance monitoring sites under 40 CFR 141.24 (f)(1), (2), or (3). For systems that are required to monitor source (raw) water for compliance purposes, the UCMR program accommodates these compliance sites in the following way: If sampling and testing at source water compliance sampling points results in detection of any UCMR List 1 contaminants, then Assessment Monitoring must shift to entry points to the distribution system for unregulated contaminants unless there is no treatment.

10. Large Systems

For Assessment Monitoring, large systems will follow the sampling requirements in § 141.40. They are explained further in the draft methods and quality control manual.

11. Systems in State Monitoring Plans

EPA's "UCMR Guidance for Operators of Public Water Systems Serving 10,000 or Fewer Persons" explains the responsibilities of PWSs that are part of the representative sample and State Monitoring Plan. It also explains further the requirements for operators of small systems, which are found at § 141.40(a)(3), (4), (5) and Appendix A, and addresses sampling including frequency and location, receipt and use of sampling equipment, shipping samples to laboratories, reviewing the results, and reporting. States can use the guidance to give monitoring schedules and instructions to systems when informing them of their responsibility to participate in the representative sample and State Monitoring Plan.

Small systems that are part of a State Monitoring Plan must sample at the locations specified in the regulation, similar to the other systems described previously. EPA will inform the competitively selected laboratories about which systems are included in the State Monitoring Plans and should therefore receive sampling equipment.

Ten percent of the systems in the State Monitoring Plans will be randomly selected to collect duplicate samples for quality control purposes. These samples will be collected using the same

procedures as those for the first sample collection.

12. Screening Survey

The Screening Survey is not part of today's rule. Today's rule only publishes the UCMR (1999) List 2 contaminants that systems will monitor for once the necessary analytical methods are developed, peer reviewed, proposed, and promulgated. When the methods are ready, EPA will issue a rule requiring large and small PWSs to collect water samples and submit them for testing to determine the presence of specified contaminants. EPA will pay for the shipping and testing of samples collected by small systems in State Monitoring Plans.

13. Pre-Screen Testing

Except for publishing the List 3 contaminants as part of the revised UCMR (1999) list, Pre-Screen Testing is not part of today's rule. Once analytical methods for these contaminants are developed, peer reviewed, proposed and promulgated. EPA will promulgate a rule specifying the sample locations and dates, analytical methods to be used, and minimum reporting levels.

Pre-Screen Testing will be a limited sampling and testing effort, conducted under controlled conditions. EPA will ask States to identify, within 90 days of the request, 5 to 25 large and small systems vulnerable to List 3 contaminants so that EPA will have a national set of up to 200 systems to collect samples. The Agency intends to use the results of this testing to determine whether a more representative monitoring effort should be made through Assessment Monitoring or a Screening Survey. Although the samples will come from the most vulnerable systems in the country'and not from a statistically valid, randomly selected group of systems'EPA could decide to regulate one or more of the List 3 contaminants if monitoring and other available information shows a clear and present threat to public health.

Persons taking samples to be tested for certain contaminants may require specific training and skills to ensure the integrity of the samples. In such cases, EPA may contract for sampling services, and the PWS owner/operator would be required only to provide access to the sampling locations.

The Agency will pay for shipping and testing samples from small systems participating in the Pre-Screen Testing. EPA will forward testing results for review by the PWSs and States before posting them on the NCOD where the public can access them. Large systems will pay for sampling, shipping, and testing at EPA-approved laboratories, and they will report the results to EPA and provide a copy to the State. EPA will enter the data into the NCOD.

14. Testing

As explained previously, EPA has prepared a methods and quality control manual for taking samples and analyzing them for contaminants on the monitoring list. The manual covers the requirements found in § 141.40(a)(3), (4), and (5) and Appendix A. EPA will make the manual available to systems, States and other interested parties in hard copy and on the Internet. Laboratories testing for unregulated contaminants at the request of PWSs will need to follow the requirements of § 141.40 and Appendix A. EPA plans to establish a program to review methods implementation and performance of the participating laboratories.

For small PWSs in State Monitoring Plans, EPA will identify through competitive bids one to five laboratories that will test their water samples for the presence of unregulated contaminants. The Agency is doing this so it can pay for the testing of samples from small PWSs. Later this year, EPA will seek bids from laboratories that wish to be considered for this effort. The first samples are expected to be available for testing after January 1, 2001.

For large systems required to test for contaminants on Lists 2 and 3, EPA will open a process to approve on a competitive basis, a limited number of laboratories for these analyses. This approval process will occur as EPA specifies methods for Lists 2 and 3 contaminants.

15. Reporting Requirements

The results of contaminant testing will have to be reported along with the 17 data elements identified in today's rule. Inventory data about systems (including PWS facility identification numbers allowing association of treatment plants to sampling points, and latitude and longitude of treatment plants) reported by States will be addressed separately in Safe Drinking Water Information System Inventory Reporting Requirements. PWSs are responsible for reporting electronically to EPA, unless EPA specifies alternative reporting requirements, such as a standard paper form that can be electronically scanned to make the data available in electronic format for computer storage, retrieval, and use. The PWSs must also provide a copy of the results to their States.

Small systems listed in State Monitoring Plans and large systems will have to report five data elements to the laboratory testing its samples: PWS identification number; PWS facility identification number for source (intake, well or wellfield), treatment plant, and sampling points; water source type; sample identification number; and sample collection date. The remaining data elements will be provided by the laboratory. If systems have not previously reported PWS facility identification number for sources, treatment plants and sampling points prior to their first UCMR report, then they must do so at the time of the first report. This information must be reported so that each sampling point used for UCMR sampling must be able to be associated with its treatment plant(s) and source(s) in use at the time the sampling occurred.

For systems demonstrating that they are not able to report electronically, EPA may specify an alternative reporting format that will allow EPA to enter the system's data into the National Drinking Water Contaminant Occurrence Database. EPA will use the "Unregulated Contaminant Monitoring Reporting Guidance" to guide the development of this alternative reporting format.

16. Record Keeping

Today's rule does not change PWSs' responsibility for keeping records of data from unregulated contaminant monitoring, which are presented in § 141.33, for PWSs.

17. Previously Collected Data

Public water systems that have previously collected data on List 1 may submit this information. However, this data must meet the specific testing and reporting requirements as described in today's final rule.

18. Modifying the Monitoring List

As required under SDWA Section 1445, EPA will modify the Unregulated Contaminant Monitoring List, Table 1, every 5 years to include the contaminants of greatest concern at that time. If EPA still requires additional data for some previously listed contaminants, they may remain on the list. Within each 5-year listing cycle, EPA will also modify the monitoring list to include the analytical methods for Lists 2 and 3 contaminants and their related sampling requirements. These modifications will occur through future rulemaking, with opportunity for public comment.

Funding for Testing of Samples for Systems in State Monitoring Plans and for Pre-Screen Testing. EPA will pay the cost of testing samples taken from small

systems pursuant to a State Monitoring Plan. These payments will be made directly to EPA-approved laboratories that meet the requirements of § 141.40(a)(3), (4), (5), and Appendix A, which are further described in the methods and quality control manual. The Agency expects to minimize costs of testing and take advantage of economies of scale through this approach, rather than reimbursing 800 systems for analytical costs at up to 800 different laboratories. Administrative costs will be less with this approach and contracted testing costs for a larger volume of samples should be less.

Two funding sources are available to pay for testing of these small system samples to carry out the provisions of SDWA Section 1445(a)(2)(C). Since FY 1998, EPA has been required to reserve annually $2 million from funds appropriated for the Drinking Water State Revolving Fund (DWSRF) to pay for unregulated contaminant testing. SDWA Section 1445(a)(2)(H) authorizes $10 million each year through FY 2003 to carry out all aspects of the UCMR program, including paying to test samples from small systems under State Monitoring Plans. Currently, $2 million from the DWSRF set-aside for FY 1998 and FY 1999 are available to support unregulated contaminant monitoring for small systems. EPA will use this set-aside in future years to pay for this testing and for the testing of samples drawn from small systems participating in the Screening Survey and Pre-Screen Testing. If funding for the UCMR program changes, however, EPA will need to consider how to accommodate reduced funding. The Agency could, for example, recalculate the representative sample size to a lower confidence level commensurate with available resources.

B. Implementation in Indian Country

Several provisions of this rule apply to State governments, and this preamble section clarifies how they will apply in Indian country.

As explained earlier, EPA intends to include all small systems in Indian country in a single, separate group. Like small systems in each State, small systems anywhere in Indian country may be selected at random to participate in the UCM program. EPA will not, however, notify the State of the systems selected and allow the State to select alternatives for systems that have closed, merged, or that purchase their water from other systems. Instead, EPA will contact the appropriate tribal governments for that purpose. The resulting group of systems will compose the single "State Plan" for Indian country. The EPA will notify selected systems of their UCMR responsibilities.

Tribes with "treatment as a State" status may enter into an MOA with EPA to provide support in implementing the UCMR for small systems monitoring plans. For systems on tribal lands of Tribes not having "treatment as a State" status, EPA will serve as the point of contact with the system and will implement the UCMR with the tribe. In either case, the steps of implementation would be the same as those described previously.

C. Performance-based Measurement System

EPA's Office of Water plans to implement a performance-based measurement system (PBMS) that would allow the option of using either performance criteria or reference methods in its drinking water regulatory programs, removing the requirement that only EPA-specified and approved analytical methods be used in SDWA regulatory programs. The requirement to use approved methods for SDWA regulatory programs would, however, be maintained for certain method-defined analytes (e.g., Total Coliform and asbestos), and for data gathering prospective to regulation, such as the contaminant monitoring in this rule.

As noted above, many of the contaminants of interest for the Unregulated Contaminant Monitoring (UCM) program can be classified as "emerging" and thus do not have existing performance criteria or reference methods. In addition to collecting information about contaminant occurrence, the UCM program will enable the development of reference methods and performance criteria. UCM testing will provide data to assist the Agency in developing performance criteria that would be proposed with the MCL, monitoring requirements, etc. for an analyte. For these reasons, the Agency is specifying the method to be used for UCM testing. Once, however, a contaminant proceeds to regulation development as an NPDWR, EPA expects to have sufficient data and method development information to be able to propose both performance criteria and a validated reference method, either of which could be used for compliance monitoring of the contaminant.

X. Guidance Manuals

EPA will provide a guidance manual to further explain the quality control measures that laboratories will need to perform for all unregulated contaminant monitoring. For systems that are part of State Plans for representative samples, the sampling guidance, "UCMR Guidance for Operators of Public Water Systems Serving 10,000 or Fewer Persons", will be available. Commenters asked for additional time to review the guidances for implementing this regulation. EPA will provide additional time for review and comment on the guidances: (1) UCMR Guidance for Operators of Public Water Systems Serving 10,000 or Fewer Persons; (2) UCMR Integrated Guidance; (3) UCMR Reporting Guidance; (4) Contaminant Selection, Methods, and Sampling: Technical Background Information for the UCMR. The guidance and manual "UCMR Analytical Methods and Quality Control Manual" and "National Representative Sample of Small Public Water Systems: Statistical Design and State Plans for the UCMR" will be available through the EPA Safe Drinking Water Hotline at 800-426-4791, or through EPA's Office of Ground Water and Drinking Water Homepage at www.epa.gov/safewater at the time of promulgation of this rule. EPA would apply these same testing and quality control procedures to the samples of all monitored systems. These final procedures are discussed in more detail in Section D. "Monitoring Requirements Under the Final UCMR".

XI. Costs and Benefits of the Rule

A. Program Cost Estimates

Today's final rule requires that only Assessment Monitoring for List 1 contaminants (12 chemical contaminants) be conducted over a 3-year period by all 2,774 large PWSs and a randomly selected representative sample of 800 small systems. Perchlorate and acetochlor monitoring will be activated under List 1 shortly after today's rule, by a separate regulation that will add the methods for those contaminants. Monitoring for contaminants on Lists 2 and 3 will wait until EPA promulgates rules to initiate the Screening Survey and Pre-Screen Testing.

Labor costs pertain to systems, State primacy agencies, and EPA. They include activities such as reading the regulation, notifying systems selected to participate, sample collection, reporting, record keeping, and data analysis.

Non-labor costs will be incurred primarily by EPA and by large PWSs. They include the cost of shipping samples to laboratories for testing and the cost of the actual laboratory analyses. The Agency also will incur non-labor costs in procuring services to conduct quality assurance surveys at contract laboratories and in collecting

samples at a select number of Index systems.

Laboratory analysis accounts for almost 70 percent of the national cost for a program such as this one. These costs generally are calculated as follows: the number of systems multiplied by the number of sampling points is multiplied by the sampling frequency and then multiplied by the cost of laboratory analysis. (This calculation is repeated for each separate analytical method). Shipping is added to the calculated costs to derive the total direct analytical non-labor costs. Instead of assuming that large systems will pay the full analytical costs for Assessment Monitoring, EPA assumes they will pay smaller "incremental" analytical costs because UCMR monitoring will coincide with ongoing Phase II/V compliance monitoring. In some cases, UCMR analyses use the laboratory analytical methods required for ongoing compliance monitoring. Therefore, when unregulated contaminant monitoring and Phase II/V monitoring are conducted concurrently, only incremental fees are charged for the analysis of additional UCMR compounds. Of course, if analyzing samples for some unregulated contaminants requires testing methods that are not currently in use, no cost savings can be realized. Note that, since the methods for perchlorate and acetochlor have a "Reserved" status in this rule promulgation, costs for these contaminants will be estimated when the rule revisions for these methods are published.

The details of EPA's cost assumptions and estimates can be found in the Information Collection Request (ICR) prepared for this rule (ICR No. 1882.01), which presents estimated costs and burden for the 1999–2001 period. It was sent to the Office of Management and Budget (OMB) on April 15, 1999. A background cost document, "Burden and Cost Calculation for the Unregulated Contaminant Monitoring Regulation," is attached as an appendix to the ICR. It presents the total and the estimated annual cost and burden for the final rule's first 5-year cycle (from 2001 to 2005). Some of the costs EPA estimated are associated with program start-up and may not recur in future monitoring cycles. Although some of these start-up costs might be incurred before 2001, they are included and averaged as part of the 5-year program costs to simplify the calculations; systems will incur costs only during the 5-year monitoring cycle. Copies of the ICR may be obtained from Sandy Farmer by mail at: Office of Policy Regulatory Information Division; U.S. Environmental Protection Agency (2137); 401 M St., S.W.; Washington, DC 20460, by email at: farmer.sandy@epa.gov, or by calling: (202) 260–2740. A copy may also be downloaded from the Internet at: http://www.epa.gov/icr.

In preparing the UCMR ICR, EPA relied on standard assumptions and data sources used in the preparation of other drinking water program ICRs. These include the public water system inventory, number of entry points per system, and labor rates. To estimate the labor burden for State and some system activities, the Agency used its standard State Resource Model, which is documented in the Resource Analysis Computer Program for State Drinking Water Agencies (January 1993). Other assumptions are discussed next.

1. Assumptions: Assessment Monitoring

EPA's estimated cost of Assessment Monitoring is based on the following assumptions:

- Surface water systems will sample 4 times during 1 year and ground water systems will sample twice during 1 year in the 5-year UCMR program cycle.
- EPA will pay the testing costs for the representative sample of 800 small systems, which will be performed by selected laboratories.
- Large systems will pay for their own testing, which will be performed by laboratories of their choice (in accordance with UCMR program quality control requirements).
- All systems will, to the extent practical, conduct their chemical sampling along with their standard compliance monitoring to reduce labor burden and analytical costs where possible.

In addition, various quality assurance and quality control measures (e.g., 10 percent duplicate samples from the representative systems) will be in effect. Water samples also will be taken from a group of 30 small "Index systems" (a subset of the national representative sample of small systems) during all 5 years of the monitoring cycle to assess any trends in temporal occurrence, other data variability, or program problems.

2. Estimated Average Annual Cost for 5-Year Program: Assessment Monitoring Only

EPA estimates that the average annual cost of nationwide Assessment Monitoring is approximately $8.4 million, as follows:

- EPA: $3.1 million, including $2.0 million in testing costs for small systems.
- States: $461,500.
- Small systems: $16,440.
- Large systems: $4.8 million.

The estimated average annual cost (labor plus non-labor) is approximately $21 per participating small system and $1,735 per large system.

These average annual costs do not represent the peak costs expected to be encountered during program implementation. Most of the monitoring, and hence most of the costs, are expected to occur over a 3-year period, allowing for follow-up work and data review, reporting, and analysis. EPA's peak year costs (during the 3 core years of Assessment Monitoring primarily for the representative sample) are estimated to be $3.6 million for Assessment Monitoring. Peak year costs for large systems are projected to be about $8.0 million for Assessment Monitoring.

B. Estimated Net Costs

EPA estimated the UCMR program's net cost by comparing the new program costs, with the estimated costs of the unrevised program (i.e., the baseline costs). The standard labor rates and activities used to estimate the new program costs were also used to determine the baseline costs, and the same water inventory numbers were used for the comparison. A simplifying assumption with respect to the baseline that all systems serving more than 500 persons monitor during the same 5-year interval—was also made.

The Agency also had to address several differences between the two programs. The regulation replaced by today's rule did not require systems serving 150 or fewer service connections to monitor for unregulated contaminants unless requested to do so by the State. Data in the drinking water program information system suggest that State required about one-third of the systems serving 500 or fewer people to monitor; thus one-third of systems serving 150 or fewer service connections were included in EPA's baseline estimates.

Another significant difference between the previous program and the new one is the list of contaminants for which monitoring is required. The previous regulations required monitoring for 48 chemicals included in Table 1 of the Proposed Rule Preamble (64 FR 23401). (Although monitoring for 14 of the chemicals was discretionary, their associated costs were derived from the analytical method required for the other unregulated contaminants and the regulated volatile organic compounds [VOCs]. Consequently, they do not make a substantive difference in the cost estimates.) Although the previous program required monitoring for more

contaminants than does the program implemented by today's final rule, monitoring requirements of the previous UCMR program were derived from fewer analytical methods, and all were derived from standard methods used for routine compliance samples. Hence, the analytical costs were relatively lower.

Given the above assumptions and full implementation over 5 years, the revised UCMR program will save small drinking water systems an estimated $35.8 million over the estimated baseline. The annual costs for each small system participating in unregulated contaminant monitoring are reduced an estimated $190. Small systems will realize this saving because, unlike the previous program, the new program does not require any of them to pay for the analysis of water samples to determine the presence of unregulated contaminants. Only small systems chosen for the representative national sample will incur any costs, and they will be labor costs only.

Under the UCMR Assessment Monitoring program, large systems will face a $10.2 million increase in costs, primarily from the increase in laboratory analytical costs. Average annual large system costs are estimated to increase by approximately $730 under the new UCMR program.

EPA estimated the baseline costs to the States at $7.5 million over the 2001–2005 monitoring cycle, plus year 2000 start-up costs. Total estimated saving to States under the revised UCMR program is an estimated $5.2 million. This saving will be primarily in labor costs because the States will have oversight interactions with only 800 small water systems, far fewer than previously were involved in unregulated contaminant monitoring.

EPA estimated that it would have cost the Agency $1.9 million to run the previous monitoring program over the 2001–2005 monitoring period, plus start-up costs. The Agency's costs are estimated to almost double under the revised Assessment Monitoring program primarily because it will fund sample shipment and analysis for small systems.

The cost reductions also can be attributed to the "Suspension of Unregulated Contaminant Monitoring Requirements for Small Public Water Systems (Direct Final Rule)," which was published in the **Federal Register** on January 8, 1999. It suspended the requirement for small systems to perform another round of monitoring for unregulated contaminants because it would have overlapped with the revised UCMR program. Approximately two-thirds of the systems between 3,300 and 10,000 persons will save the cost of monitoring in 1999 and 2000 by the action of the Direct Final Rule, resulting in a savings of about $5.3 million for these systems.

C. Benefits

Today's rule significantly reduces burden, especially for small water systems. The original UCMR program, initiated in 1988, required all community water systems (CWSs) to monitor for 48 contaminants. States could waive the requirement for systems serving 150 or fewer service connections, although these systems had to be available for monitoring under the regulation. Analysis of the first round of data, from 1988 to 1993, indicates that well over 25,000 PWSs were involved in the original monitoring program. The revised program will involve only 3,574 to 3,724 systems: 2,774 large systems and up to 800 small systems.

The systems that will be regulated under today's rule will monitor for fewer contaminants than was the case under the original UCMR program. EPA will pay the small systems' costs of testing, keeping their burden to a minimum and limiting it to collecting the samples and contacting a shipping service to pick them up for delivery to a laboratory. The Agency also will manage the laboratory testing program for these systems, minimizing the time they interact with the laboratories. The laboratories contracted by EPA to perform the analyses also will provide electronic reporting services for small systems that lack this capability. Consequently, the costs borne by the selected 800 systems will be substantially reduced under the revised program.

Regarding the full UCMR program, cost savings can be attributed to the use of a small sample of small and large systems in the Screening Surveys and Pre-Screen Testing. The two Screening Surveys of 300 systems each and the Pre-Screen Testing of up to 200 systems will allow statistically valid, targeted approaches to be applied to emerging contaminants. These early screening efforts will help EPA determine whether contaminants are already in public water systems and whether they should be monitored for in the subsequent 5-year monitoring cycle. This approach—rather than requiring Assessment Monitoring for all 30 contaminants at all monitored systems—is projected to save large water systems and EPA more than $50 million in annual Assessment Monitoring costs.

State burden also will be reduced. A substantial portion of State burden depends on the number of systems that a State must manage. Although the revised UCMR program introduces some new elements, fewer systems are involved so State oversight activity (e.g., system notification and record keeping) will be reduced.

Today's final rule increases the number of data elements that must be reported from 12 to 17. These data must be reported with each sample to make the monitoring data more useful for analysis. However, the additional burden on systems is minimal, because most of the data elements will be reported to EPA by laboratories which already routinely record many of them.

The long-term benefits of the revised UCMR program are:

- Contaminants whose occurrence in drinking or source water is not widespread will be identified early, which will enable evaluations and decisions to minimize further the monitoring and resources that would otherwise be committed to those contaminants.
- Contaminants whose occurrence in drinking water is widespread will trigger additional research on health effects and treatment as soon as practical to protect the health of sensitive persons.
- The use of a representative sample of small systems (which comprise the majority of PWSs) can provide a scientifically sound, statistically valid data set that can be used for improved analysis and program decisions at reduced cost.

XII. Administrative Requirements

A. Executive Order 12866—Regulatory Planning and Review

Under Executive Order 12866 (58 FR 51735, October 4, 1993), the Agency must determine whether a regulatory action is "significant" and therefore subject to OMB review and the requirements of the Executive Order. The Order defines "significant regulatory action" as one that is likely to result in a rule that may:

(1) Have an annual effect on the economy of $100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities;

(2) Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;

(3) Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or

(4) Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the Executive Order.

It has been determined that this rule is not a "significant regulatory action" under the terms of Executive Order 12866 and is therefore not subject to OMB review.

B. Executive Order 13045—Protection of Children From Environmental Health Risks and Safety Risks

Executive Order 13045, "Protection of Children from Environmental Health Risks and Safety Risks" (62 FR 19885, April 23, 1997), applies to any rule that (1) is determined to be "economically significant" as defined under E.O. 12866 and (2) concerns an environmental health or safety risk that EPA has reason to believe may have a disproportionate effect on children. If the regulatory action meets both criteria, the Agency must evaluate the environmental health or safety effects of the planned rule on children, and explain why the planned regulation is preferable to other potentially effective and reasonably feasible alternatives considered by the Agency.

This rule is not subject to E.O. 13045 because it is not "economically significant" as defined under E.O. 12866. Further, EPA interprets E.O. 13045 as applying only to those regulatory actions that are based on health or safety risks, such that the analysis required under section 5-501 of the Order has the potential to influence the regulation. This final rule is not subject to E.O. 13045 because it does not establish an environmental standard intended to mitigate health or safety risks. For the most part, this rule establishes procedures for monitoring of unregulated contaminants on the Agency's CCL. Given EPA's interest in protecting children's health, however, as part of the provisions in the rule allowing State governors and Indian tribes to petition EPA to add contaminants to the Unregulated Contaminant Monitoring List, EPA asks them specifically to include any information that might be available regarding disproportional risks to the health or safety of children. Such information would help inform EPA's decision making regarding future lists.

This final rule is part of the Agency's overall strategy for deciding whether to regulate the contaminants on the CCL (63 FR 10273). Its purpose is to ensure that EPA has data on the occurrence of contaminants on the CCL where those data are lacking. EPA is also taking steps to ensure that the Agency will have data on the health effects of these contaminants on children through its research program. The Agency will use these occurrence and health effects data to decide whether to regulate any of these contaminants.

C. Unfunded Mandates Reform Act

Title II of the Unfunded Mandates Reform Act of 1995 (UMRA), Pub L. 104-4, establishes requirements for Federal agencies to assess the effects of their regulatory actions on State, local, and tribal governments and the private sector. Under UMRA section 202, EPA generally must prepare a written statement, including a cost-benefit analysis, for proposed and final rules with "Federal mandates" that may result in expenditures to State, local, and tribal governments, in the aggregate, or to the private sector, of $100 million or more in any one year. Before promulgating a rule for which a written statement is needed, UMRA section 205 generally requires EPA to identify and consider a reasonable number of regulatory alternatives and adopt the least costly, most cost-effective, or least burdensome alternative that achieves the objectives of the rule. The provisions of section 205 do not apply when they are inconsistent with applicable law. Moreover, section 205 allows EPA to adopt an alternative other than the least costly, most cost-effective, or least burdensome alternative if the Administrator publishes with the final rule an explanation of why that alternative was not adopted. Before EPA establishes any regulatory requirements that may significantly or uniquely affect small governments, including tribal governments, it must have developed under UMRA section 203 a small government agency plan. The plan must provide for notifying potentially affected small governments, enabling officials of affected small governments to have meaningful and timely input in the development of EPA regulatory proposals with significant Federal intergovernmental mandates, and informing, educating, and advising small governments on compliance with the regulatory requirements.

EPA has determined that this rule does not contain a Federal mandate that may result in expenditures of $100 million or more for State, local, and tribal governments, in the aggregate, or for the private sector in any one year. Total annual costs of today's rule for State, local, and Tribal governments and the private sector, are estimated to be $7.3 million, of which EPA will pay $2.0 million, or 27 percent. Thus, today's rule is not subject to the requirements of UMRA sections 202 and 205.

EPA has determined that this rule contains no regulatory requirements that might significantly or uniquely affect small governments because EPA will pay for the reasonable costs of sample testing for the small PWSs required to sample and test for unregulated contaminants under this rule, including those owned and operated by small governments. The only costs that small systems will pay are the costs attributed to (1) the labor associated with reading the regulations, guidance, and instructions to implement the monitoring requirements, (2) collecting the samples and packing them for shipping to the laboratory (EPA will pay for shipping), and (3) reporting and record keeping. These costs are not significant. Thus, today's rule is not subject to the requirements of UMRA section 203.

D. Paperwork Reduction Act

The Office of Management and Budget (OMB) has approved the information collection requirements contained in this rule under the provisions of the *Paperwork Reduction Act*, 44 U.S.C. 3501 *et seq.* and has assigned OMB control number 2040-0208. An Information Collection Request (ICR) document which presents estimated costs and burdens for the 1999-2001 period has been prepared by EPA (ICR No. 1882.02). A background cost document, "*Burden and Cost Calculations for the Unregulated Contaminant Monitoring Regulation,*" is attached as an appendix to the ICR and presents the estimated costs and burdens for the first 5-year cycle of the final rule. A copy of these may be obtained from Sandy Farmer by mail at OP Regulatory Information Division; U.S. Environmental Protection Agency (2137); 401 M St., S.W.; Washington, DC 20460; by email at: farmer.sandy@epa.gov; or by calling: (202) 260-2740. A copy may also be downloaded from the Internet at: http://www.epa.gov/icr.

The information to be collected under today's rule is to fulfill the statutory requirements of section 1445(a)(2) of the Safe Drinking Water Act, as amended in 1996. The data to be collected will describe the source water, location, and test results for samples taken from PWSs. The concentrations of any identified UCMR contaminants will be evaluated regarding health effects and will be considered for future regulations accordingly. Reporting is mandatory. The data are not subject to confidentiality protection.

Burden is defined as the total time, effort, or financial resources expended by persons to generate, maintain, retain,

or disclose or provide information to or for a Federal agency. This includes the time needed to review instructions; develop, acquire, install, and use technology and systems to collect, validate, verify, process, maintain, disclose, and provide information; adjust the existing ways to comply with any previously applicable instructions and requirements; train personnel to be able to respond to a collection of information; search data sources; complete and review the collection of information; and transmit or otherwise disclose the information.

The annual burden and cost estimates described below are for the implementation assumptions put forth in this Rule, which includes only the Assessment Monitoring component of the UCMR Program. For Assessment Monitoring, the respondents are 800 small water systems (in the national representative sample of systems serving 10,000 or fewer people), 2,774 large public water systems, and 56 States and primacy agents (3,630 total respondents). The frequency of response varies across respondents and years. System costs (particularly laboratory analytical costs) vary depending on the number of entry or sampling points.

For the three-year ICR period 1999–2001, small systems will sample and report an average of 2.7 times for the entire period. The burden for small systems is estimated to be an average of 1.5 hours annually per system, with an annual cost of $31. Large systems will sample and report an average of 2.9 times for the entire period, and are estimated to have a 3.3 hour per system annual burden, with a labor cost of $93 per year. Non-labor costs per year for these systems is estimated at $2,798 per system. On average, States are assumed to report quarterly during each UCMR implementation year. It is estimated that each State will incur 141 hours of burden per year, with an annual labor cost of $5,647 for the ICR period 1999–2001. Non-labor costs for States were assumed to be minimal, with 10 percent of the States incurring a one-time $25,000 contractor cost for the optional upgrading of their drinking water databases; an average of $833 per year per State for the ICR period. In aggregate, the average respondent (i.e., small systems, large systems, and the States) incurs an average annual burden of 9.0 hours and a labor plus non-labor cost of $2,400. Because the actual implementation period of the UCMR does not begin until 2001, most of the costs presented here occur during that year. Average annual costs reflect the fact that the UCMR program implementation only overlaps with one of the three ICR years (1999–2001).

The burden and cost per response for the three ICR years for Assessment Monitoring are estimated to be 1.7 hour burden at $35 per response for small systems; 3.4 hours at $95 for labor and $2,847 in analytical costs for large systems; and 52.9 hours at $2,116 for labor for States. In aggregate, the average response (i.e., responses from small systems, large systems, and the States) is associated with a burden of 8.7 hours, with a labor plus non-labor cost of $2,213 per response over the three-year ICR period.

Over the ICR period, the Agency is estimated to incur an annual burden of 9,150 hours, with an average annual cost for labor of $366,000. Non-labor costs for EPA, which are primarily comprised of the analytical and shipping costs for representative set of small systems, and other contractor costs, are estimated at $1.3 million per year over the period 1999–2001. Non-labor costs are primarily attributed to the cost of sample testing for small systems.

An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number on its ICR. The OMB control numbers for EPA's regulations are listed in 40 CFR Part 9 and 48 CFR Chapter 15. EPA is amending the table in 40 CFR Part 9 of currently approved ICR control numbers issued by OMB for various regulations to list the information requirements contained in the final rule.

E. Regulatory Flexibility Act

Under the Regulatory Flexibility Act (RFA), 5 U.S.C. 601 et seq., as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA), EPA generally is required to conduct a regulatory flexibility analysis describing the impact of the regulatory action on small entities as part of rulemaking. However, under section 605(b) of the RFA, if EPA certifies that the rule will not have a significant economic impact on a substantial number of small entities, the Agency is not required to prepare a regulatory flexibility analysis. Pursuant to RFA section 605(b), 5 U.S.C. 605(b) and for the reasons set forth below, I certify that this rule will not have a significant economic impact on a substantial number of small entities.

For purposes of RFA analyses for SDWA rulemakings, the Agency defines small entities as systems serving 10,000 or fewer customers because this is the size of system specified in SDWA as requiring special consideration with respect to small system flexibility. This alternative definition was established for all drinking water rules in the Consumer Confidence Reports rulemaking (63 FR 44511–44536 [August 19, 1998]). EPA also consulted with the Small Business Administration about the alternative definition as it relates to small businesses. For further information on the establishment of this definition of small entities, see the referenced **Federal Register** notice.

EPA has determined that the UCMR will affect small water utilities, since it is applicable to a subset of small community and non-transient noncommunity water systems. However, the affected systems are limited to a representative sample of approximately 800 small PWSs, or 1.2 percent of systems serving 10,000 or fewer persons. These systems will be required to conduct monitoring, as specified in the UCMR (i.e., collect and prepare samples for shipping). EPA will assume all costs for testing of the samples and for shipping the samples from these systems to certified laboratories throughout the United States. EPA has set aside $2 million from the DWSRF in Fiscal Years 1998 and 1999, and plans to do so into the future with its authority to set aside DWSRF monies to implement this SDWA provision.

EPA has estimated the impact of today's rule and concludes that the rule will not have a significant economic impact on a substantial number of small entities. The rationale for this conclusion is that EPA plans to pay the full costs of shipping and testing samples for small systems and does not plan, under any scenario, to ask systems to pay these costs. (The costs to these systems will be limited to the labor hours associated with collecting a sample and preparing it for shipping.)

EPA evaluated the cost to small entities under two scenarios. Under either scenario, EPA will assume the cost of shipping and testing samples for small systems. The "full implementation" scenario assumes full funding from the DWSRF set-aside through the year 2005, with the full Assessment Monitoring program being implemented. The "limited implementation" scenario assumes that EPA will pay for testing with the funds already set aside for this program. Under either scenario, this rule will not have a significant economic impact on a substantial number of small entities, and EPA certifies that fact. Cost summaries for both scenarios are provided below.

1. Full Assessment Monitoring Implementation Scenario

EPA analyzed separately the impact on small privately and publicly owned water systems because of the different economic characteristics of these ownership types. For publicly owned systems, EPA used the "revenue test," which compares a system's annual costs attributed to the rule with the system's annual revenues. EPA used a "sales test" for privately owned systems, which involves the analogous comparison of UCMR-related costs to a privately owned system's sales. EPA assumes that the distribution of the national representative sample of small systems will reflect the proportions of publicly and privately owned systems in the national inventory. The estimated distribution of the representative sample, categorized by ownership type, source water, and system size, is presented below in Table 5.

TABLE 5.—NUMBER OF PUBLICLY AND PRIVATELY OWNED SYSTEMS TO PARTICIPATE IN ASSESSMENT MONITORING

Size category	Publicly owned systems		Privately owned systems		Total—all systems
	Non-index systems	Index systems	Non-index systems	Index systems	
Ground Water Systems:					
500 and under	20	1	76	2	99
501 to 3,300	146	6	67	3	222
3,301 to 10,000	144	7	40	2	193
Subtotal	310	14	183	7	514
Surface Water Systems:					
500 and under	18	0	49	0	67
501 to 3,300	51	2	23	1	77
3,301 to 10,000	106	5	30	1	142
Subtotal	175	7	102	2	286
Total	485	21	285	9	800

The basis for the UCMR RFA certification under full Assessment Monitoring program implementation is as follows: the average annual compliance costs of the rule represent less than 1 percent of revenues/sales for the 800 small water systems that will be affected. The EPA estimates that EPA and system costs for implementing small system sampling for the full UCMR Assessment Monitoring program (2001–2005) will be approximately $10.2 million. Since the Agency specifically structured the rule to avoid significantly affecting a substantial number of small entities by assuming all costs for laboratory analyses, shipping, and quality control for small entities, EPA costs comprise approximately 99 percent ($10.1 million) of the total costs. (Note that EPA's contribution to the small system program is assumed to include all small system analytical and shipping costs, as well as all non-labor program support costs.) Table 6 presents the annual costs to small systems and to EPA for the small system sampling program, along with the number of participating small systems during each of the 5 years of the program.

TABLE 6.—EPA COSTS FOR SMALL SYSTEMS UNDER FULL IMPLEMENTATION OF UCMR ASSESSMENT MONITORING

Cost description [1]	2001	2002	2003	2004	2005	Total
Costs to EPA for Small System Program: quality assurance, ongoing coordination, data analysis, analytical costs, shipping costs, and costs for contractor site visits to small Index systems [2]	$3,317,970	$2,647,790	$2,617,790	$856,890	$648,440	$10,088,880
Costs to Small Systems: additional labor for monitoring or monitoring assistance	26,796	25,840	25,840	1,861	1,861	82,198
Total Costs to EPA and Small Systems for UCMR	3,924,769	2,993,810	3,053,630	1,338,752	1,150,297	10,171,078
Number of Systems to be Monitoring each Year: Non-Index and Index in 2001–2003, Index only in 2004–2005 [3]						
Public	182	182	182	107	21	533
Private	104	104	104	81	9	267
Total	286	286	286	188	30	800

[1] AM = Assessment Monitoring.
[2] EPA costs during the year 2001 include some start-up costs that may actually be incurred during the year 2000.
[3] Total number of systems is 800. All 30 Index systems sample during each year 2001–2005. One-third of Non-Index systems sample during each year from 2001–2003. The rows do not add across, because the same 30 Index systems sample during every year of 5-year implementation cycle.

System costs are attributed to the labor required for reading State notification letters, monitoring, reporting, and record keeping. Assuming that systems will efficiently conduct UCMR sampling (e.g., coincident with other required monitoring when feasible), the estimated average annual per system labor burden for full Assessment Monitoring implementation will be $17 (0.8 hours) for ground water systems and $27 (1.3 hours) for surface water systems. In total, ground water and surface water systems average 1.0 hours of burden per year with an average annual cost of $21. Average annual cost, in all cases, is less than 0.2 percent of system revenues/sales. Therefore, as stated previously, the Administrator certifies that this rule, as funded by EPA, will not have a significant economic impact on small entities. Tables 7a and 7b below present the estimated economic impacts in the form of revenue/sales tests for publicly and privately owned systems.

TABLE 7a.—UCMR FULL ASSESSMENT MONITORING IMPLEMENTATION SCENARIO: ANALYSIS FOR PUBLICLY-OWNED SYSTEMS (2001–2005)

System size	Annual number of systems affected [1]		Average annual hours per system (2001–2005)		Average annual cost per system (2001–2005)		"Revenue test" [2] (percent)	
	Number	Percent of US total	Non-index	Index	Non-index	Index	Non-index	Index
Ground Water Systems								
500 and under	4.8	0.01	0.6	2.0	$9.03	$28.28	0.05	0.17
501 to 3,300	35.4	0.29	0.7	2.8	10.12	39.88	0.01	0.04
3,301 to 10,000	35.8	1.49	0.9	3.6	24.02	100.80	0.01	0.02
Surface Water Systems								
500 and under	3.5	0.18	1.1	0.0	16.39	0.00	0.06	0.00
501 to 3,300	12.2	0.67	1.2	4.2	18.03	60.90	0.01	0.03
3,301 to 10,000	25.9	2.58	1.2	4.0	33.24	112.00	0.00	0.02

[1] Calculated as ⅕ of the Non-Index sample, plus all Index systems for each year from 2001–2005; actual sampling for Non-Index systems takes place over three years, while that of Index systems occurs over each of five years.
[2] The "Revenue Test" was used to evaluate the economic impact of an information collection on small government entities (e.g., publicly-owned systems); costs are presented as a percentage of median annual revenue in each size category.

TABLE 7b.—UCMR FULL ASSESSMENT MONITORING IMPLEMENTATION SCENARIO: ANALYSIS FOR PRIVATELY-OWNED SYSTEMS (2001–2005)

System size	Annual number of systems affected [1]		Average annual hours per system (2001–2005)		Average annual cost per system (2001–2005) [1]		"Sales test" [2] (percent)	
	Number	Percent of US total	Non-index	Index	Non-index	Index	Non-index	Index
Ground Water Systems								
500 and under	17.6	0.04	0.6	2.0	$9.03	$28.28	0.06	0.18
501 to 3,300	16.2	0.13	0.7	2.8	10.12	39.88	0.01	0.04
3,301 to 10,000	10.1	0.42	0.9	3.6	24.02	100.80	0.00	0.02
Surface Water Systems								
500 and under	9.7	0.51	1.1	0.0	16.39	0.00	0.07	0.00
501 to 3,300	5.6	0.31	1.2	4.2	18.03	60.90	0.01	0.04
3,301 to 10,000	7.3	0.72	1.2	4.0	33.24	112.00	0.01	0.02

[1] Calculated as ⅕ of the Non-Index sample, plus all Index systems for each year from 2001–2005; actual sampling for Non-Index systems takes place over three years, while that of Index systems occurs over each of five years.
[2] The "Sales Test" was used to evaluate the economic impact of an information collection on small private entities (e.g., privately-owned systems); costs are presented as a percentage of median annual sales in each size category.

2. Limited Implementation Scenario

Despite the expected $2 million annual budget, EPA recognizes that funding levels vary from year to year and thus the Agency cannot guarantee the precise amount that will ultimately be available to implement its UCMR Assessment Monitoring Program (although a considerable portion of those funds are currently on hand). If an amount commensurate with funding the optimal UCMR Assessment Monitoring Program (in terms of numbers of small systems sampled and numbers of contaminants analyzed) is not available, the Agency will adjust the UCMR program to accommodate the available funds. This adjustment may necessitate use of fewer sample sites, testing for fewer contaminants, or both.

Although the Agency considers the scenario of no additional funding to be unlikely, EPA also evaluated the scenario of "current funds only" for purposes of this RFA analysis. In this "current available funds" scenario EPA would receive no funding for small system testing beyond the $4 million set aside from the DWSRF in FY 1998 and FY 1999. EPA anticipates funding this program such that no small system would incur testing costs, as intended in the legislation. Small systems would be responsible only for taking the sample. By analyzing the small system impact under this scenario, EPA can

demonstrate that, regardless of funding levels, the UCMR will not have a significant economic impact on a substantial number of small entities. Given the flexibility of the proposed rule, EPA can ensure scientifically defensible results, balanced with available funding.

In the optimal program, the sample of 800 systems is derived by applying a 99 percent confidence level, with 1 percent error tolerance. To accommodate a $4 million budget, the representative sample of small systems would be reduced to approximately 400 systems. Although this smaller sample would be less rigorous than the anticipated sample of 800 systems, the sample error would still remain within plus or minus 5 percent. These 400 systems would incur only labor costs for collecting and packing the samples, while EPA would pay to ship and test these samples.

With the currently available $4 million, EPA will be able to fund approximately 50 percent of the planned Assessment Monitoring program for small systems. To estimate the costs under this scenario, EPA assumed that only the Assessment Monitoring component of the UCMR would be implemented and that the smaller representative sample would be allocated across system size categories in the same proportions as those in the sample of 800 systems, with 10 of these systems being Index sites, as seen in Table 8. Finally, for the cost analysis of this current funds scenario, EPA assumed that the national representative sample will reflect the proportions of publicly and privately owned systems in the national inventory of public water systems.[1] Because EPA's statistical approach uses a random selection process for systems in the national representative sample, publicly-and privately-owned systems should be selected in the same proportions for that sample as they occur in the set of all community and non-transient non-community water systems in the nation.

The Agency is concerned that a reduced sample size will reduce the statistical likelihood that the observed contaminant occurrence levels will be representative of actual occurrence across the nation. Because of this, the Agency will actively pursue funding for the full program described in this Preamble.

Table 8.—Number of Publicly- and Privately-Owned Systems To Participate in Assessment Monitoring, for Limited Funding Program [1]

Size category	Publicly-owned systems		Privately-owned systems		Total—all systems
	Non-index systems	Index systems	Non-index systems	Index systems	
Ground Water Systems:					
500 and under	10	0	39	1	50
501 to 3,300	75	2	34	1	112
3,301 to 10,000	73	2	21	1	97
Subtotal ground water systems	158	4	94	3	259
Surface Water Systems:					
500 and under	9	0	24	0	33
501 to 3,300	26	1	12	0	39
3,301 to 10,000	54	2	15	0	71
Subtotal surface water systems	89	3	51	0	143
Total	247	7	145	3	402

[1] The Limited Funding Program assumes that the only funds available to run the program are those that are currently in hand—$4 million of set aside funds from Federal Fiscal Years 1998 and 1999. This is a "worst case" funding scenario.

Under the limited funding scenario, EPA's costs for Assessment Monitoring would be incurred primarily from 2001 to 2003. Systems are assumed to sample during 1 year of the 3-year period, with one-third of systems sampling during each year. However, Index Systems are assumed to monitor during each of the three Assessment Monitoring years. The distribution of costs to EPA and small systems over the entire 5 years is presented in Table 9.

TABLE 9.—EPA COSTS FOR SMALL SYSTEMS—LIMITED $4 MILLION PROGRAM

Cost description	2001	2002	2003	2004	2005	Total
Costs to EPA for Assessment Monitoring Program: Quality assurance, ongoing coordination, data analysis, shipping costs, testing costs, reporting and analysis costs, and costs for contractor site visits to "Index" systems	$1,367,947	$1,082,342	$1,082,342	$280,422	$186,948	$4,000,000
Costs to Small Systems (Assessment Monitoring): including additional labor for monitoring or monitoring assistance	13,162	11,527	11,527	0	0	36,216

[1] Publicly- and privately-owned systems allocations are estimated using data from the 1995 Community Water System Survey. Publicly-owned systems are those that are owned by a city, town, township, village, municipal government, State or federal government, or any other publicly-owned or operated system. Privately-owned systems include those owned by private investors or homeowners' associations.

TABLE 9.—EPA COSTS FOR SMALL SYSTEMS—LIMITED $4 MILLION PROGRAM—Continued

Cost description	2001	2002	2003	2004	2005	Total
Total Costs to EPA and Small Systems for Assessment Monitoring	1,381,109	1,093,869	1,093,869	280,422	186,948	4,036,216
Number of Systems each Year: Assessment Monitoring and Index Systems in 2001–2003:[1]						
Public	89	89	89	0	0	254
Private	51	51	51	0	0	148
Total	140	140	140	0	0	402

[1] Rows do not add across because the 10 Index systems sample during each year 2001–2003. One-third of Non-Index systems sample during each year from 2001–2003.

Under this limited $4 million program, EPA's costs represent approximately 98 percent of the national cost for the small system sampling program. As in full UCMR implementation, small system costs are attributed to the additional labor required for reading State letters, monitoring, reporting, and record keeping. It is estimated that under a limited program of Assessment Monitoring only the average annual per system labor burden will be $14 (0.7 hours) for ground water systems and $25 (1.2 hours) for surface water systems. In total, ground water and surface water systems average 0.9 hours of burden per year, with an average annual cost of $18.

Through revenue and sales tests, determinations of economic impact are presented in Tables 10a and 10b respectively. Under this limited $4 million program, systems will be subject to less required monitoring than in the full UCMR program. For both full Assessment Monitoring implementation and the limited funding scenario, average annual cost is in all cases lower than 1 percent of annual sales/revenues. Thus, even in this worst case, limited implementation scenario, EPA certifies that today's final rule would not impose a significant economic impact on small entities.

TABLE 10a.—UCMR LIMITED IMPLEMENTATION SCENARIO: ANALYSIS FOR PUBLICLY-OWNED SYSTEMS (2001–2005)

System size	Annual number of systems affected[1]		Average annual hours per system (2001–2005)		Average annual cost per system (2001–2005)		"Revenue test"[2] (percent)	
	Number	Percent of US total	Non-index	Index	Non-index	Index	Non-Index	Index
Ground Water Systems								
500 and under	2.1	0.00	0.6	1.3	$8.06	$18.71	0.05	0.11
501 to 3,300	16.2	0.13	0.6	1.5	9.15	22.19	0.01	0.02
3,301 to 10,000	16.1	0.67	0.8	2.0	22.16	57.12	0.00	0.01
Surface Water Systems								
500 and under	1.7	0.09	1.1	0.0	15.41	0.00	0.05	0.00
501 to 3,300	5.6	0.31	1.2	2.6	17.07	38.28	0.01	0.02
3,301 to 10,000	11.8	1.17	1.1	2.5	31.35	70.56	0.00	0.01

[1] Calculated as ⅕ of publicly-owned Non-Index sample, plus all public Index systems for each year from 2001–2003; actual sampling for Non-Index takes place over 3 years, Index in each of 3 years.

[2] The "Revenue Test" was used to evaluate the economic impact of an information collection on small governments (e.g., publicly owned systems); costs are presented as a percentage of median annual revenue in each size category.

TABLE 10b.—UCMR Limited Implementation Scenario: Analysis for Privately-Owned Systems (2001–2005)

System size	Annual number of systems affected[1]		Average annual hours per system (2001–2005)		Average annual cost per system (2001–2005)		"Revenue test"[2] (percent)	
	Number	Percent of US total	Non-index	Index	Non-index	Index	Non-index	Index
Ground Water Systems								
500 and under	8.2	0.02	0.6	1.3	$8.06	$18.71	0.05	0.12
501 to 3,300	7.4	0.06	0.6	1.5	9.15	22.19	0.01	0.02
3,301 to 10,000	4.5	0.19	0.8	2.0	22.16	57.12	0.00	0.01
Surface Water Systems								
500 and under	4.8	0.25	1.1	0.0	15.41	0.00	0.07	0.00
501 to 3,300	2.5	0.14	1.2	2.6	17.07	38.28	0.01	0.03

TABLE 10b.—UCMR Limited Implementation Scenario: Analysis for Privately-Owned Systems (2001–2005)—Continued

System size	Annual number of systems affected [1]		Average annual hours per system (2001–2005)		Average annual cost per system (2001–2005)		"Revenue test" [2] (percent)	
	Number	Percent of US total	Non-index	Index	Non-index	Index	Non-index	Index
3,301 to 10,000	3.3	0.33	1.1	2.5	31.35	70.56	0.01	0.01

[1] Calculated as ⅕ of the Non-Index sample, plus all Index systems for each year from 2001–2005; actual sampling for Non-Index systems takes place over 3 years, while that of Index systems occurs during each of 3 years.
[2] The "Sales Test" was used to evaluate the economic impact of an information collection on small private entities (e.g., privately owned systems); costs are presented as a percentage of median annual sales in each size category.

F. National Technology Transfer and Advancement Act

As noted in the proposed rule, Section 12(d) of the National Technology Transfer and Advancement Act (NTTAA), Pub. L. No. 104–113, § 12(d) (15 U.S.C. 272 note) directs EPA to use voluntary consensus standards in its regulatory activities unless to do so would be inconsistent with applicable law or otherwise impractical. Voluntary consensus standards are technical standards (e.g., materials specifications, test methods, sampling procedures, and business practices) that are developed or adopted by voluntary consensus standards bodies. The NTTAA directs EPA to provide Congress, through OMB, explanations when the Agency decides not to use available and applicable voluntary consensus standards.

This rulemaking involves technical standards. EPA has decided to use consensus methods published by the three major voluntary consensus method organizations—Standard Methods, AOAC International, and American Society for Testing and Materials (ASTM)—that would be acceptable for compliance determinations under SDWA for the UCMR (1999) List 1. The voluntary consensus methods found are listed in § 141.40(a)(3), Table 1, List 1. For the Assessment Monitoring portion of the final rule, EPA is approving the use of all of the non-EPA analytical methods adopted by these voluntary consensus groups that are applicable to the analyses of these unregulated contaminants when used in conjunction with the required quality-control practices specified in the rule.

A few public comments suggested the updating of consensus methods approved in Table 1, List 1, or an additional method to consider. To that end, the Agency updated the consensus methods listed to include those identified in the most current (20th) edition of Standard Methods (SM). SM 6200B, from the 20th edition, is also approved for volatile analysis; SM 6210D remains on the list but only appears in previous editions. A commenter suggested use of SM 6640 for DCPA mono and di acids for List 1; however, this method does not address hydrolysis, a critical step in the analyses of this contaminant, so EPA is not including it on the list.

EPA conducted a search to identify potentially applicable voluntary consensus standards for chemical and microbiological parameters included in Lists 2 and 3 of this rule. EPA identified and listed in the proposal some general methods specifications that the Agency believes may potentially be used to reliably detect some of the contaminants on List 2. However, EPA was unable to find either an EPA or voluntary consensus method applicable to the monitoring required and none were brought to our attention in comments on the proposed rule. Commenters suggested EPA also approve EPA Method 632 for linuron and diuron, which does not include confirmation or preservation steps; and EPA Method 552 for the phenols, which has low recoveries and interferences among the compounds. For these reasons, EPA has not included these EPA methods for the respective contaminants. No other voluntary consensus standards were brought to the Agency's attention in comments on the proposed rule. EPA is developing acceptable methods to determine the presence of the contaminants on Lists 2 and 3, and will take additional public comment when the rules are proposed for monitoring of List 2 and 3 contaminants.

G. Executive Order 12898—Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations

Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations" (February 11, 1994), focuses federal attention on the environmental and human health conditions of minority and low-income populations with the goal of achieving environmental protection for all communities.

By seeking to identify unregulated contaminants that may pose health risks via drinking water from all PWSs, the unregulated contaminant monitoring regulation furthers the protection of public health for all citizens, including minority and low-income populations using public water supplies. Using a statistically derived set of systems for the national representative sample that is population-weighted within each system size category allocated across States, the final rule ensures that no group within the population is under represented.

H. Federalism Executive Orders

Under Executive Order 12875, EPA may not issue a regulation that is not required by statute and that creates a mandate upon a State, local, or tribal government, unless the Federal government provides the funds necessary to pay the direct compliance costs incurred by those governments, or EPA consults with those governments. If EPA complies by consulting, Executive Order 12875 requires EPA to provide to OMB with a description of the extent of EPA's prior consultation with representatives of affected State, local, and tribal governments; the nature of their concerns; any written communications from the governments; and a statement supporting the need to issue the regulation. In addition, Executive Order 12875 requires EPA to develop an effective process permitting elected officials and other representatives of State, local, and tribal governments "to provide meaningful and timely input in the development of regulatory proposals containing significant unfunded mandates."

EPA has concluded that today's rule will create a mandate on local governments that own or operate PWSs and that the Federal government will not provide the funds necessary to pay all of the direct costs incurred by these governments in complying with the mandate. However, EPA will pay for the

sample testing costs of small systems and has budgeted funds to do so.

In developing this rule, EPA consulted with State, local, and tribal governments to enable them to provide meaningful and timely input in the development of this rule. Prior to the publication of the proposed rule, EPA received input through its public stakeholder process, by conducting public meetings and through targeted mailings. Additionally, EPA received input through its public comment process from 22 States, 13 public water systems and local water agencies, and 130 other commenters, including non-profit organizations, associations, industry, and individuals. EPA also sent out nearly 400 targeted mailings directly to 360 Tribes, Tribal organizations, and small water system organizations to ensure that they were informed of the proposed rule's publication and had an opportunity to comment. The principal concerns raised were that: (1) States did not want to go through the primacy process; (2) EPA should include perchlorate on the monitoring list; (3) EPA should use multi-analyte methods to the extent possible for testing; and (4) EPA should allow previous monitoring data for some of the contaminants on the list. In response to these principal concerns, EPA changed the implementation steps for the regulation from primacy revisions to a Memorandum of Agreement with States. Perchlorate is now on UCMR List 1 (1999) for early monitoring. EPA incorporated as many additional contaminants in List 1 using multi-analyte methods as possible, specifically moving acetochlor from List 2 to List 1. Systems can submit previously collected data to meet the UCMR, as long as the requirements for sampling, testing and reporting are met.

Finally, while there is a new executive order on federalism, Executive Order 13132, it will not go into effect until November 3, 1999. In the interim, under the current Executive Order 12612 on federalism, this rule does not have a substantial direct effect upon States, upon the relationship between the national government and the States, or upon the distribution of power and responsibilities among the various levels of government. The final rule allows States to decide whether they want to enter a Memorandum of Agreement (MOA) with EPA to implement the monitoring program. If they decide not to enter into an MOA, then EPA will directly implement the monitoring program, since the data are for the purposes of deciding which contaminants to regulate in the future at the Federal level and will not have a direct effect on public health protection under current drinking water standards implemented by States.

I. Executive Order 13084—Consultation and Coordination with Indian Tribal Governments

Under Executive Order 13084, EPA may not issue a regulation that is not required by statute, that significantly or uniquely affects the communities of Indian Tribal governments, and that imposes substantial direct compliance costs on those communities, unless the Federal government provides the funds necessary to pay the direct compliance costs incurred by the Tribal governments, or EPA consults with those governments. If EPA complies by consulting, Executive Order 13084 requires EPA to provide to OMB, in a separately identified section of the preamble to the rule, a description of the extent of EPA's prior consultation with representatives of affected Tribal governments, a summary of the nature of their concerns, and a statement supporting the need to issue the regulation. In addition, Executive Order 13084 requires EPA to develop an effective process permitting elected officials and other representatives of Indian Tribal governments "to provide meaningful and timely input in the development of regulatory policies on matters that significantly or uniquely affect their communities."

Today's rule does not significantly or uniquely affect the communities of Indian Tribal governments. Only one Tribal water system serves more than 10,000 persons. All the other Tribal water systems serve 10,000 or fewer persons, and in today's rule have an equal probability of being selected in the national representative sample of small systems, for which EPA will pay the costs of unregulated contaminant testing. Thus, these Tribal water systems will be treated the same as water systems of a State and the impact of the rule on them will not be significant.

This rule will not impose substantial direct compliance costs on such communities either because, with the exception of the one large Tribal water system, the Federal government will provide most of the funds necessary to pay the direct costs incurred by tribal governments in complying with the rule. Accordingly, the requirements of section 3(b) of Executive Order 13084 do not apply to this rule. Nevertheless, in developing this rule, EPA consulted with representatives of Tribal governments pursuant to both Executive Order 12875 and Executive Order 13084. The extent of EPA's consultation, the nature of the governments' concerns, and EPA's position supporting the need for this rule, are discussed in the preamble section that addresses compliance with Executive Order 12875. Tribes were consulted and raised issues concerning the utility of a targeted, rather than a representative random, sampling approach and the applicability of "treatment as a State" under the final rule.

J. Congressional Review Act

The Congressional Review Act, 5 U.S.C. § 801 *et seq.*, as added by the Small Business Regulatory Enforcement Fairness Act of 1996, generally provides that before a rule may take effect, the agency promulgating the rule must submit a rule report, which includes a copy of the rule, to each House of the Congress and to the Comptroller General of the United States. EPA will submit a report containing this rule and other required information to the U.S. Senate, the U.S. House of Representatives, and the Comptroller General of the United States prior to publication of the rule in the **Federal Register**. A major rule cannot take effect until 60 days after it is published in the **Federal Register**. This action is not a "major rule" as defined by U.S.C. § 804(2). This rule will be effective January 1, 2001.

XIII. Public Involvement in Regulation Development

EPA's Office of Ground Water and Drinking Water has developed a process for stakeholder involvement in its regulatory activities to provide early input to regulation development. Activities related to the UCMR included meetings for developing the CCL and the information requirements of the NCOD, as well as specific meetings focused on revising the UCMR monitoring list. During the development of the UCMR, stakeholders from a wide range of public and private entities provided key perspectives. Representatives from public water systems, States, industry, and other organizations attended two stakeholder meetings to discuss options directly related to the UCMR. An additional 17 meetings were held with stakeholders and the public concerning issues related to the UCMR. In total, 21 State health and environmental agencies, 5 water systems, 6 water associations, 6 health associations, 5 industrial associations, 4 environmental organizations, 4 community and consumer organizations, 29 companies, and 7 federal agency offices participated in meetings that were instrumental in the development of today's final rule.

As noted previously, the CCL identifies contaminants for which EPA

may take regulatory action and for which EPA needs additional data. The UCMR list contains contaminants for which additional data are needed before EPA can determine their regulatory status. The meetings to develop the CCL included stakeholder meetings to discuss the list broadly and meetings focused on particular issues conducted through the National Drinking Water Advisory Council's (NDWAC) Working Group on Occurrence and Contaminant Selection, as follows:

- December 2-3, 1996 Stakeholders Meeting.
- April 3-4, 1997 NDWAC Working Group.
- June 23, 1997 NDWAC Working Group.
- July 17, 1997 NDWAC Working Group.
- January 7, 1998 NDWAC Conference Call.

These meetings resulted in the Drinking Water Contaminant Candidate List (63 FR 10274, March 2, 1998). The contaminants in today's rule for unregulated contaminant monitoring are taken in large part from the CCL "Occurrence Priorities."

The NCOD development activities included 10 public meetings on information requirements that should be considered for inclusion in the database. These meetings were held between October 1997 and February 1998. The work of the NCOD development team is incorporated as the reporting requirements for sample testing in today's unregulated contaminant monitoring regulation. Several documents concerning the NCOD development which were used in the public meetings are:

- Options for the National Drinking Water Contaminant Occurrence Data Base, Background Document (Working Draft), EPA 815-D-97-001, May 1997.
- National Drinking Water Contaminant Occurrence Data Base—Development Strategy, Background Document (Working Draft), EPA 815-D-97-005, December 1997.
- Options for Design of the National Drinking Water Contaminant Occurrence Data Base, Background Document (Working Draft), EPA 815-D-98-001, January 1998.

EPA held its first stakeholder meeting to discuss options for the development of the Unregulated Contaminant Monitoring Regulation on December 2 and 3, 1997, in Washington, DC. A variety of stakeholders attended that meeting, including representatives of PWSs, States, industry, health and laboratory organizations, and the public. EPA prepared a background document for the meeting, Options for Developing the Unregulated Contaminant Monitoring Regulation (Working Draft), EPA 815-D-97-003, November 1997. A summary of the meeting is also available. EPA held a second stakeholders meeting on June 3 and 4, 1998 to obtain input from interested parties on significant issues evolving from drafting the regulation, which needed further public input. The Agency prepared a public review document for that meeting, Background Information and Draft Annotated Outline for a Proposed Unregulated Contaminant Monitoring Regulation, Background Document, (Working Draft), May 1998. A meeting summary also is available. EPA also sent special requests for review of stakeholder documents to more than 360 Tribes (exclusive of the Alaskan native villages) and to small systems organizations to obtain their input.

In all, EPA held 17 public meetings with stakeholders and interested parties related directly or closely to the final Unregulated Contaminant Monitoring Regulation. Additionally, EPA received 39 comments by the public comment date of June 14, 1999, from a range of the public, including individuals, water systems, States, environmental organizations, and associations. EPA also received 121 comments after the comment period, primarily from individuals concerned with perchlorate being on the Monitoring List.

XIV. References

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List of Subjects

40 CFR Part 9

Environmental protection, Reporting and recordkeeping requirements.

40 CFR Part 141

Environmental protection, Analytical methods, Chemicals, Incorporation by Reference, Intergovernmental relations, Microorganisms, Monitoring, Water supply.

40 CFR Part 142

Environmental protection, Analytical methods, Chemicals, Intergovernmental relations, Microorganisms, Monitoring, Water supply.

Dated: August 30, 1999.

Carol M. Browner,

Administrator.

For the reasons set out in the preamble, title 40 Chapter I of the Code of Federal Regulations is amended as follows:

PART 9—OMB APPROVALS UNDER THE PAPERWORK REDUCTION ACT

1. The authority citation for part 9 continues to read as follows:

Authority: 7 U.S.C. 135 *et seq.*, 136-136y; 15 U.S.C. 2001, 2003, 2005, 2006, 2601-2671; 21 U.S.C. 331j, 346a, 348; 31 U.S.C. 9701; 33 U.S.C. 1251 *et seq.*, 1311, 1313d, 1314, 1318, 1321, 1326, 1330, 1342, 1344, 1345(d) and (e); 1361; E.O. 11735, 38 FR 21243, 3 CFR, 1971-1975 Comp. p. 973; 42 U.S.C. 241, 242b, 243, 246, 300f, 300g, 300g-1, 300g-2, 300g-3, 300g-4, 300g-5, 300g-6, 300j-1, 300j-2, 300j-3, 300j-4, 300j-9, 1857 *et seq.*, 6901-6992k, 7401-7671q, 7542, 9601-9657, 11023, 11048.

2. Section 9.1 is amended by removing the entry for "141.33-141.35"; revising the entry for "141.40"; and by adding in numerical order under the indicated heading new entries "141.33-141.34" and "141.35" to read as follows:

§ 9.1 OMB approvals under the Paperwork Reduction Act.

* * * * *

40 CFR Citation	OMB control No.
National Primary Drinking Water Regulations	
141.33–141.34	2040–0090
141.35	2040–0208
141.40	2040–0208

* * * * *

PART 141—NATIONAL PRIMARY DRINKING WATER REGULATIONS

1. The authority citation for part 141 continues to read as follows:

Authority: 42 U.S.C. 300f, 300g-1, 300g-2, 300g-3, 300g-4, 300g-5, 300g-6, 300j-4, 300j-9, and 300j-11.

2. Section 141.35 is revised to read as follows:

§ 141.35 Reporting of unregulated contaminant monitoring results.

(a) *Does this reporting apply to me?* (1) This section applies to any owner or operator of a public water system required to monitor for unregulated contaminants under § 141.40. This section requires you to report the results of this monitoring.

(2) *Exception.* You do not need to report results if you are a system serving a population of 10,000 or less, since EPA will arrange for testing and reporting of the results. However, you will still need to comply with consumer confidence reporting and public notification requirements for these results.

(b) *To whom must I report?* You must report the results of unregulated contaminant monitoring to EPA and provide a copy to the State. You must also notify the public of the monitoring results as provided in Subpart O (Consumer Confidence Reports) and Subpart Q (Public Notification) of this part.

(c) *When must I report monitoring results?* You must report the results of unregulated contaminant monitoring within thirty (30) days following the month in which you received the results from the laboratory . EPA will place the data in the national drinking water contaminant occurrence database sixty (60) days after you report the data to allow for quality control review by systems and States.

(d) *What information must I report?* You must report the information specified in the following table for each sample, and for each spiked sample and spike duplicate sample analyzed for quality control purposes and associated with each sample and its sample batch:

TABLE 1.—UNREGULATED CONTAMINANT MONITORING REPORTING REQUIREMENTS

Data element	Definition
1. Public Water System (PWS) 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—Source, Treatment Plant, and Sampling Point.	An identification number established by the State, or, at the State's discretion, the PWS, that is unique to the system for an intake for each source of water, a treatment plant and a sampling point. Within each PWS, each intake, treatment plant and sampling point must receive a unique identification number, including, for intake; surface water intake, ground water well or wellfield centroid; and including, for sampling point; entry points to the distribution system, wellhead, intake, locations within the distribution system, or other representative sampling point specified by the State. The same identification number must be used consistently throughout the history of unregulated contaminant monitoring to represent the facility.
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	A numeric value assigned by the PWS or laboratory to uniquely identify a specific sampling occurrence.
5. Contaminant/Parameter	The unregulated contaminant or water quality parameter for which the sample is being analyzed.
6. Analytical Results—Sign	An alphanumeric value indicating whether the sample analysis result was: (a) (<) "less than" means the contaminant was not detected or was detected at a level "less than" the MRL. (b) (=) "equal to" means the contaminant was detected at a level "equal to" the value reported in "Analytical Result—Value."
7. Analytical Result—Value	The actual numeric value of the analysis for chemical and microbiological results, or the minimum reporting level (MRL) if the analytical result is less than the specified contaminant's MRL
8. Analytical Result—Unit of Measure	The unit of measurement for the analytical results reported. [e.g., micrograms per liter, (µg/L); colony-forming units per milliliter, (CFU/mL), etc.]
9. Analytical Method Number	The identification number of the analytical method used.
10. Sample Analysis Type	The type of sample collected. Permitted values include: (a) Field Sample—sample collected and submitted for analysis under this rule. (b) Batch Spike/Spike Duplicate—Samples associated with a batch used for calculating analytical precision and accuracy. A batch is defined as the set of field samples plus one spiked sample and one spiked duplicate sample analyzed for contaminant concentrations
11. Sample Batch Identification Number	A number assigned by the laboratory to the batch of samples analyzed with the spiked sample (at the spiking concentration reported), to be reported as 9-digit laboratory number (assigned by the State or EPA), 4-digit year, 2-digit month, 2-digit day and 2-digit batch number.
12. Detection Level	"Detection level" refers to the detection limit applied to both the method and equipment. Detection limit is the lowest concentration of a target contaminant that a given method or piece of equipment can reliably ascertain and report as greater than zero (e.g., Instrument Detection Limit, Method Detection Limit, or Estimated Detection Limit).
13. Detection Level Unit of Measure	The unit of measure to express the concentration, count, or other value of a contaminant level for the detection level reported. (e.g., µg/L, colony forming units/mL (CFU/mL), etc.)

TABLE 1.—UNREGULATED CONTAMINANT MONITORING REPORTING REQUIREMENTS—Continued

Data element	Definition
14. Analytical Precision	Precision is the degree of agreement among a set of repeated measurements and is monitored through the use of replicate samples or measurements. 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 Relative Percent Difference (RPD) between spiked matrix duplicates using, $RPD = [(X_1-X_2) / (X_1 + X_2)/2] \times 100$
15. Analytical Accuracy	Accuracy describes how close a result is to the true value measured through the use of spikes, standards, surrogates or performance evaluation 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] × 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	*Chemicals:* Presence—a response was produced by the analysis (i.e., greater than or equal to the MDL but less than the MRL)/Absence—no response was produced by the analysis (i.e., less than the MDL). *Microbiologicals:* Presence—indicates a response was produced by the analysis /Absence—indicates no response was produced by the analysis.

(e) *How must I report this information?* You must report this information in the electronic or other format specified by EPA.

(f) *Can the laboratory to which I send samples report the results for me?* Yes, as long as the laboratory sends you a copy for review and recordkeeping. However, you are responsible for the reporting of this information and ensuring that the laboratory reports these results to EPA, with a copy to the State, on time.

(g) *Can I report previously collected data to meet the testing and reporting requirements for the contaminants listed in § 141.40(a)(3)?* Yes, as long as the data meet the specific requirements of § 141.40(a)(3), (4), (5), and Appendix A of § 141.40 and you report the data with the information specified in paragraph (d) of this section.

3. Section 141.40 is revised to read as follows:

§ 141.40 Monitoring requirements for unregulated contaminants.

(a) *Requirements for owners and operators of public water systems.* (1) *Do I have to monitor for unregulated contaminants?*

(i) *Transient systems.* If you own or operate a transient non-community water system, you do not have to monitor for unregulated contaminants.

(ii) *Large systems not purchasing their entire water supply from another system.* If you own or operate a wholesale or retail public water system (other than a transient system) that serves more than 10,000 persons, as determined by the State, and do not purchase your entire water supply from another public water system, you must monitor as follows:

(A) You must monitor for the unregulated contaminants on List 1 of Table 1, Unregulated Contaminant Monitoring Regulation (1999) List, in paragraph (a)(3) of this section.

(B) You must monitor for the unregulated contaminants on List 2 of Table 1, Unregulated Contaminant Monitoring Regulation (1999) List, in paragraph (a)(3) of this section, if notified by your State or EPA that you are part of the Screening Surveys.

(C) You must monitor for the unregulated contaminants on List 3 of Table 1, Unregulated Contaminant Monitoring Regulation (1999) List, in paragraph (a)(3) of this section, if notified by your State or EPA that you are part of the Pre-Screen Testing.

(iii) *Large systems purchasing their entire water supply from another system.* If you own or operate a public water system (other than a transient system) that serves more than 10,000 persons and purchase your entire water supply from a wholesale public water system, you must monitor as follows:

(A) You must monitor for the unregulated contaminants on List 1 of Table 1, Unregulated Contaminant Monitoring Regulation (1999) List, in paragraph (a)(3) of this section, that have a "sampling location" indicated as "distribution system".

(B) You must monitor for the unregulated contaminants on List 2 of Table 1, Unregulated Contaminant Monitoring Regulation (1999) List, in paragraph (a)(3) of this section, that have a "sampling location" indicated as "distribution system" if notified by your State or EPA that you are part of the Screening Surveys.

(C) You must monitor for the unregulated contaminants on List 3 of Table 1, Unregulated Contaminant Monitoring Regulation (1999) List, in paragraph (a)(3) of this section, that have a "sampling location" indicated as "distribution system" if notified by your State or EPA that you are part of the Pre-Screen Testing.

(iv) *Small systems not purchasing their entire water supply from another system.* If you own or operate a public water system (other than a transient system) that serves 10,000 or fewer persons and do not purchase your entire water supply from another public water system, you must monitor as follows:

(A) You must monitor for the unregulated contaminants on List 1 of Table 1, Unregulated Contaminant Monitoring Regulation (1999) List, in paragraph (a)(3) of this section, if you are notified by your State or EPA that you are part of the State Monitoring Plan for small systems.

(B) You must monitor for the unregulated contaminants on List 2 of Table 1, Unregulated Contaminant Monitoring Regulation (1999) List, in paragraph (a)(3) of this section, if you are notified by your State or EPA that you are part of the Screening Surveys.

(C) You must monitor for the unregulated contaminants on List 3 of Table 1, Unregulated Contaminant Monitoring Regulation (1999) List, in paragraph (a)(3) of this section, if you are notified by your State or EPA that you are part of the Pre-Screen Testing.

(v) *Small systems purchasing their entire water supply from another*

system. If you own or operate a public water system (other than a transient system) that serves 10,000 or fewer persons and purchase your entire water supply from a wholesale public water system, you must monitor as follows:

(A) You must monitor for the unregulated contaminants on List 1 of Table 1, Unregulated Contaminant Monitoring Regulation (1999) List, in paragraph (a)(3) of this section, that have a "sampling location" indicated as "distribution system" if you are notified by your State or EPA that you are part of the State Monitoring Plan for small systems.

(B) You must monitor for the unregulated contaminants on List 2 of Table 1, Unregulated Contaminant Monitoring Regulation (1999) List, in paragraph (a)(3) of this section, that have a "sampling location" indicated as "distribution system" if you are notified by your State or EPA that you are part of the Screening Surveys.

(C) You must monitor for the unregulated contaminants on List 3 of Table 1, Unregulated Contaminant Monitoring Regulation (1999) List, in paragraph (a)(3) of this section, that have a "sampling location" indicated as "distribution system" if you are notified by your State or EPA that you are part of the Pre-Screen Testing.

(2) *How would I be selected for the monitoring under the State Monitoring Plan, the Screening Surveys, or the Pre-Screen Testing?* (i) State Monitoring Plan. Only a representative sample of small systems must monitor for unregulated contaminants. EPA will select a national representative sample of small public water systems in each State through the use of a random number generator. Selection will be weighted by population served within each system water source type (surface or ground water) and system size category (systems serving 25–500, 501–3,300, and 3,301–10,000 persons). EPA may allocate additional systems to water source types or system size categories to increase the statistical inferential ability for those categories. EPA will also select a small group of systems to be "Index systems." Systems selected as Index systems are required to provide information about their site and operation that will serve to allow extrapolation of their results to other systems of similar size, rather than collecting detailed information at every small system. Each State will have the opportunity to make some modifications to the list of small systems that EPA selects. You will be notified by the State or EPA if your system is part of the final State Monitoring Plan.

(ii) *Screening Surveys.* The purpose of the Screening Surveys is to determine the occurrence of contaminants in drinking water or sources of drinking water for which analytical methods have recently been developed for unregulated contaminant monitoring. EPA will select up to 300 systems to participate in each survey by using a random number generator. You will be notified by the State or EPA if your system is selected for monitoring under the Screening Surveys.

(iii) *Pre-screen Testing.* The purpose of Pre-Screen Testing is to determine the occurrence of contaminants for which EPA needs to evaluate new analytical methods in locations where the contaminants are most likely to be found. EPA will select up to 200 systems to participate in this testing after considering the characteristics of the contaminants, precipitation, system operation, and environmental conditions. You will be notified by the State or EPA that your system has been selected for monitoring under the Pre-Screen Testing program.

(3) *For which contaminants must I monitor?* Lists 1, 2 and 3 of unregulated contaminants are listed in the following table:

TABLE 1.—UNREGULATED CONTAMINANT MONITORING REGULATION (1999) LIST

List 1—Assessment Monitoring Chemical Contaminants					
1-Contaminant	2-CAS registry number	3-Analytical methods	4-Minimum reporting level	5-Sampling location	6-Period during which monitoring to be completed
2,4-dinitrotoluene	121–14–2	EPA 525.2[a]	2 µg/L[e]	EPTDS[f]	2001–2003
2,6-dinitrotoluene	606–20–2	EPA 525.2[a]	2 µg/L[e]	EPTDS[f]	2001–2003
Acetochlor	34256–82–1	Reserved[m]	Reserved[m]	EPTDS[f]	2001–2003
DCPA mono-acid degradate.	887–54–7	EPA 515.1[a] EPA 515.2[a] D5317–93[b] AOAC 992.32[c]	1 µg/L[e]	EPTDS[f]	2001–2003
DCPA di-acid degradate.	2136–79–0	EPA 515.1[a] EPA 515.2[a] D5317–93[b] AOAC 992.32[c]	1 µg/L[e]	EPTDS[f]	2001–2003
4,4'-DDE	72–55–9	EPA 508[a] EPA 508.1[a] EPA 525.2[a] D5812–96[b] AOAC 990.06[c]	0.8 µg/L[e]	EPTDS[f]	2001–2003
EPTC	759–94–4	EPA 507[a] EPA 525.2[a] D5475–93[b] AOAC 991.07[c]	1 µg/L[e]	EPTDS[f]	2001–2003
Molinate	2212–67–1	EPA 507[a] EPA 525.2[a] D5475–93[b] AOAC 991.07[c]	0.9 µg/L[e]	EPTDS[f]	2001–2003
MTBE	1634–04–4	EPA 524.2[a] D5790–95[b] SM 6210D[d] SM 6200B[d]	5 µg/L[g]	EPTDS[f]	2001–2003

TABLE 1.—UNREGULATED CONTAMINANT MONITORING REGULATION (1999) LIST—Continued

List 1—Assessment Monitoring Chemical Contaminants

1-Contaminant	2-CAS registry number	3-Analytical methods	4-Minimum reporting level	5-Sampling location	6-Period during which monitoring to be completed
Nitrobenzene	98–95–3	EPA 524.2[a] D5790–95[b] SM6210D[d] SM6200B[d]	10 µg/L[g]	EPTDS[f]	2001–2003
Perchlorate	14797–73–0	Reserved[m]	Reserved[m]	EPTDS[f]	2001–2003
Terbacil	5902–51–2	EPA 507[a] EPA 525.2[a] D5475–93[b] AOAC 991.07[c]	2 µg/L[e]	EPTDS[f]	2001–2003

List 2—Screening Survey Chemical Contaminants
To Be Sampled After Notice of Analytical Methods Availability

1-Contaminant	2-CAS registry number	3-Analytical methods	4-Minimum reporting level	5-Sampling location	6-Period during which monitoring to be completed
1,2-diphenylhydrazine	122–66–7	EPA 525.2[i]	Reserved[h]	EPTDS[f]	Reserved[h]
2-methyl-phenol	95–48–7	SPE/GC/MS[l]	Reserved[h]	EPTDS[f]	Reserved[h]
2,4-dichlorophenol	120–83–2	SPE/GC/MS[l]	Reserved[h]	EPTDS[f]	Reserved[h]
2,4-dinitrophenol	51–28–5	SPE/GC/MS[l]	Reserved[h]	EPTDS[f]	Reserved[h]
2,4,6-trichlorophenol	88–06–2	SPE/GC/MS[l]	Reserved[h]	EPTDS[f]	Reserved[h]
Alachlor ESA	TBD[h]	TBD[h]	Reserved[h]	EPTDS[f]	Reserved[h]
Diazinon	333–41–5	EPA 525.2[k]	Reserved[h]	EPTDS[f]	Reserved[h]
Disulfoton	298–04–4	EPA 525.2[k]	Reserved[h]	EPTDS[f]	Reserved[h]
Diuron	330–54–1	SPE/HPLC/ UV[j]	Reserved[h]	EPTDS[f]	Reserved[h]
Fonofos	944–22–9	EPA 525.2[i]	Reserved[h]	EPTDS[f]	Reserved[h]
Linuron	330–55–2	SPE/HPLC/UV[j]	Reserved[h]	EPTDS[f]	Reserved[h]
Polonium-210	13981–52–7	Reserved[h]	Reserved[h]	Reserved[h]	Reserved[h]
Prometon	1610–18–0	EPA 525.2[k]	Reserved[h]	EPTDS[f]	Reserved[h]
Terbufos	13071–79–9	EPA 525.2[k]	Reserved[h]	EPTDS[f]	Reserved[h]
RDX	121–82–4	Reserved[h]	Reserved[h]	EPTDS[f]	Reserved

List 2—Screening Survey Microbiological Contaminants
To Be Sampled After Notice of Analytical Methods Availability

1-Contaminant	2-Identification number	3-Analytical methods	4-Minimum reporting level	5-Sampling location	6-Period during which monitoring to be completed
Aeromonas	Reserved[h]	Reserved[h]	Reserved[h]	Reserved[h]	Reserved

List 3—Pre-Screen Testing Radionuclides
To Be Sampled After Notice of Analytical Methods Availability

1-Contaminant	2-CAS registry number	3-Analytical methods	4-Minimum reporting level	5-Sampling location	6-Period during which monitoring to be completed
Lead-210	14255–04–0	Reserved[h]	Reserved[h]	Reserved[h]	Reserved

List 3—Pre-Screen Testing Microorganisms
To Be Sampled After Notice of Analytical Methods Availability

1-Contaminant	2-Identification number	3-Analytical methods	4-Minimum reporting level	5-Sampling location	6-Period during which monitoring to be completed
Cyanobacteria (blue-green algae, other freshwater algae and their toxins).	Reserved[h]	Reserved[h]	Reserved[h]	Reserved[h]	Reserved[h]
Echoviruses	Reserved[h]	Reserved[h]	Reserved[h]	Reserved[h]	Reserved[h]
Coxsackieviruses	Reserved[h]	Reserved[h]	Reserved[h]	Reserved[h]	Reserved[h]
Helicobacter pylori	Reserved[h]	Reserved[h]	Reserved[h]	Reserved[h]	Reserved[h]
Microsporidia	Reserved[h]	Reserved[h]	Reserved[h]	Reserved[h]	Reserved[h]
Calciviruses	Reserved[h]	Reserved[h]	Reserved[h]	Reserved[h]	Reserved[h]
Adenoviruses	Reserved[h]	Reserved[h]	Reserved[h]	Reserved[h]	Reserved[h]

Column headings are:

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

2–CAS (Chemical Abstract Service Number) Registry No. 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 below. The incorporation by reference of the following documents listed in footnotes b-d 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 sources listed below. 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 40 CFR 141.24 (e).

[b] *Annual Book of ASTM Standards,* 1996 and 1998, Vol. 11.02, American Society for Testing and Materials. Method D5812–96 is located in the *Annual Book of ASTM Standards,* 1998, Vol. 11.02. Methods D5790–95, D5475–93, and D5317–93 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.

[b] 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. 1–800–379–2622.

[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 is 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 minimum detection limit (MDL=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 EDL equals the concentration of compound yielding approximately a 5 to 1 signal to noise ratio or the calculated MDL, whichever is greater).

[f] Entry Points to the Distribution System (EPTDS), After Treatment, representing each non-emergency water source in routine use over the twelve-month period of monitoring; 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 Method Detection Limit (MDL) or 0.5 µg/L times 10, whichever is greater. The MDL of 0.5 µg/L (0.0005 mg/L) was selected to conform to VOC MDL requirements of 40 CFR 141.24(f)(17)(i)(E).

[h] To be Determined at a later time

[i] Compound currently not listed as a contaminant in this method.

[j] Methods development currently in progress to develop a solid phase extraction/high performance liquid chromatography/ultraviolet method for the determination of this compound.

[k] Compound listed as being a contaminant using EPA Method 525.2; however, adequate sample preservation is not available. Preservation studies currently being conducted to develop adequate sample preservation.

[l] Methods development currently in progress to develop a solid phase extraction/gas chromatography/mass spectrometry method for the determination of this compound.

[m] If not determined by regulation by December 31, 2000, this contaminant will become part of List 2.

(4) *What general requirements must I follow for monitoring List 1 contaminants?* (i) All systems. You must:

(A) Collect samples of the listed contaminants in accordance with paragraph (a)(5) of this section and Appendix A of this section and any other specific instructions provided to you by the State or EPA,

(B) Analyze the additional parameters specified below in Table 2. "Water Quality Parameters to be Monitored with UCMR Contaminants" for each relevant contaminant type. You must analyze the parameters for each sampling event of each sampling point, using the method indicated, and report using the data elements 1 through 10 in Table 1, § 141.35(d), Unregulated Contaminant Monitoring Reporting Requirements;

(C) Review the laboratory testing results to ensure reliability; and

(D) Report the results as specified in § 141.35.

TABLE 2.—WATER QUALITY PARAMETERS TO BE MONITORED WITH UCMR CONTAMINANTS

Parameter	Contaminant type	Methodology		
		EPA method	Standard methods [1]	Other
pH	Chemical;	[2] 150.1	4500-H^+ B	ASTM D1293–84 [3]
	Microbiological	[2] 150.2		ASTM D1293–95 [3]
Turbidity	Microbiological	[4,5] 180.1	2130 B [4]	GLI Method 2 [4,6]
Temperature	Microbiological		2550	
Free Disinfectant Residual	Microbiological		4500-Cl D	ASTM D 1253–86 [3]
			4500-Cl F	
			4500-Cl G	
			4500-Cl H	
			4500-ClO_2 D	
			4500-ClO_2 E	
			4500-O_3 B	
Total Disinfectant Residual	Microbiological		4500-Cl D	ASTM D 1253–86 [3]
			4500-Cl E [4]	
			4500-Cl F	
			4500-Cl G [4]	
			4500-Cl I	

The procedures shall be done in accordance with the documents listed below. The incorporation by reference of the following documents 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 sources listed below. 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-Cl D, E, F, G, H, I; 4500-ClO2 D, E; 4500-H^+ B; and 4500-O_3 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 and 1996,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, 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.

(ii) *Large systems.* In addition to paragraph (a)(4)(i) of this section, you must arrange for testing of the samples according to the methods specified for each contaminant in Table 1, Unregulated Contaminant Monitoring Regulation (1999) List, in paragraph (a)(3) of this section, and in Appendix A of this section.

(iii) *Small systems.* Unless directed otherwise by the State or EPA, in addition to paragraph (a)(4)(i) of this section , you must:

(A) Properly receive, store, maintain and use the sampling equipment sent to you from the laboratory designated by EPA;

(B) Sample at the times specified by the State or the EPA;

(C) Collect and pack samples in accordance with the instructions sent to you by the laboratory designated by EPA; and

(D) Send the samples to the laboratory designated by EPA.

(5) What specific sampling and quality control requirements must I follow for monitoring of List 1 contaminants? *(i) All systems.* Unless the State or EPA informs you of other sampling arrangements, you must comply with the following requirements:

(A) *Sample collection and shipping time.* If you must ship the samples for testing, you must collect the samples early enough in the day to allow adequate time to send the samples for overnight delivery to the laboratory since some samples must be processed at the laboratory within 30 hours of collection. You must not collect samples on Friday, Saturday or Sunday because sampling on these days would not allow samples to be shipped and received at the laboratory within 30 hours.

(B) *No compositing of samples.* You must not composite (that is, combine, mix or blend) the samples. You must collect, preserve and test each sample separately.

(C) *Review and reporting of results.* After you have received the laboratory results, you must review and confirm the system information and data regarding sample collection and test results. You must report the results as provided in § 141.35.

(ii) *Large systems.* In addition to paragraph (a)(5)(i) of this section, you must comply with the following:

(A) *Timeframe.* You must collect the samples in one twelve-month period during the years indicated in column 6 of Table 1, Unregulated Contaminant Monitoring Regulation (1999) List.

(B) *Frequency.* You must collect the samples within the timeframe and according to the following frequency specified by contaminant type and water source type:

TABLE 3.—MONITORING FREQUENCY BY CONTAMINANT AND WATER SOURCE TYPES

Contaminant type	Water source type	Timeframe	Frequency
Chemical	Surface water	Twelve (12) months	Four 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	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]

[a] "Select either the first, second, or third month of a quarter and sample in that same month of each of four (4) consecutive quarters" means that you must monitor during each of the four (4) 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 you that it has selected a different time period for sampling as your system's vulnerable time.

[c] "Sample during one (1) month of the vulnerable time and during one (1) month five (5) to seven (7) months earlier or later" means, for example, that if you select May as your "vulnerable time" month to sample, then one (1) month five (5) to seven (7) months earlier would be either October, November or December of the preceding year, and one (1) month five (5) to seven (7) months later would be either, October, November, or December of the same year.

(C) *Location.* You must collect samples at the location specified for each listed contaminant in column 5 of the Table 1, UCMR (1999) List, in paragraph (a)(3) of this section. The sampling location for chemical contaminants must be the entry point to the distribution system or the compliance monitoring point specified by the State or EPA under 40 CFR 141.24(f)(1), (2), and (3). If the compliance monitoring point as specified by the State is for source (raw) water and any of the contaminants in paragraph (a)(3) of this section are detected, then you must also sample at the entry point to the distribution system at the frequency indicated in paragraph (a)(5)(ii)(B) of this section with the following exception: If the State or EPA determines that sampling at the entry point to the distribution system is unnecessary because no treatment was instituted between the source water and the distribution system that would affect measurement of the contaminants listed in paragraph (a)(3) of this section, then you do not have to sample at the entry point to the distribution system.

(D) *Sampling instructions.* You must follow the sampling procedure for the method specified in column 3 of List 1 of Table 1, Unregulated Contaminant Monitoring Regulation (1999) List, in paragraph (a)(3) of this section, for each contaminant.

(E) *Testing and analytical methods.* For each listed contaminant, you must use the analytical method specified in column 3 of List 1 of Table 1, Unregulated Contaminant Monitoring Regulation (1999) List, in paragraph (a)(3) of this section, the minimum reporting levels in column 4 of List 1 of Table 1, Unregulated Contaminant Monitoring Regulation (1999) List, in paragraph (a)(3) of this section, and the quality control procedures specified in Appendix A of this section.

(F) *Sampling deviations.* If you do not collect a sample according to the procedures specified for a listed contaminant, you must resample within 14 days of observing the occurrence of the error (which may include notification from the laboratory that you must resample) following the procedures specified for the method. (This resampling is not for confirmation sampling but to correct the sampling error.)

(G) *Testing.* You must arrange for the testing of the contaminants by a laboratory certified under § 141.28 for compliance analysis using the EPA analytical methods listed in column 3 for each contaminant in Table 1, Unregulated Contaminant Monitoring Regulation (1999) List, in paragraph (a)(3) of this section, whether you use the EPA analytical methods or non-EPA methods listed in Table 1.

(iii) *Small systems that are part of the State Monitoring Plan.* Unless directed otherwise by the State or EPA, in addition to paragraph (a)(5)(i) of this section, you must comply with the following:

(A) *Timeframe and frequency.* You must collect samples at the times specified for you by the State or EPA, within the timeframe specified in paragraph (a)(5)(ii)(A) of this section and according to the frequency specified in paragraph (a)(5)(ii)(B) of this section for the contaminant type and water source type.

(B) *Location.* You must collect samples at the locations specified for you by the State or EPA.

(C) *Sampling deviations.* If you do not collect a sample according to the instructions provided to you for a listed contaminant, then you must report the deviation on the sample reporting form that you send to the laboratory with the samples. You must resample following instructions that you will be sent from EPA's designated laboratory or the State.

(D) *Sample kits.* You must store and maintain the sample collection kits sent to you by EPA's designated laboratory in a secure place until used for sampling. You should read the instructions for each kit when you receive it. If indicated in the kit's instructions, you must freeze the cold packs. The sample kit will include all necessary containers, packing materials and cold packs, instructions for collecting the sample and sample treatment (such as dechlorination or preservation), report forms for each sample, contact name and telephone number for the laboratory, and a prepaid return shipping docket and return address label. If any of the materials listed in the kit's instructions are not included or arrive damaged, you must notify EPA's designated laboratory which sent you the sample collection kits.

(E) *Sampling instructions.* You must comply with the instructions sent to you by the State or EPA concerning the use of containers, collection (how to fill the sample bottle), dechlorination and/or preservation, and sealing and preparing the sample and shipping containers for

shipment. You must also comply with the instructions sent to you by EPA's designated laboratory concerning the handling of sample containers for specific contaminants.

(F) *Duplicate samples.* EPA will select systems in the State Monitoring Plan that must collect duplicate samples for quality control. If your system is selected, you will receive two sample kits that you must use. You must use the same sampling protocols for both sets of samples, following the instructions in the duplicate sample kit.

(G) *Sampling forms.* You must completely fill out the sampling forms sent to you by the laboratory, including the data elements 1 through 6 listed in § 141.35(d) for each sample. You must sign and date the sampling forms.

(H) *Sample submission.* Once you have collected the samples and completely filled in the sampling forms, you must send the samples and the sampling forms to the laboratory designated in your instructions.

(6) *What additional requirements must I follow if my system is selected as an Index system?* If your system is selected as an Index system in the State Monitoring Plan, you must assist the State or EPA in identifying appropriate sampling locations and provide information on which wells and intakes are in use at the time of sampling, well casing and screen depths (if known) for those wells, and the pumping rate of each well or intake at the time of sampling.

(7) *What must I do if my system is selected for the Screening Surveys or Pre-Screen Testing?* (i) *Large systems.* If your system serves over 10,000 persons, you must collect and arrange for testing of the contaminants in List 2 and List 3 of Table 1, Unregulated Contaminant Monitoring Regulation (1999) List, in paragraph (a)(3) of this section, in accordance with the requirements set out in paragraphs (a)(4) and (5) of this section. You must send the samples to one of the laboratories designated by EPA in your notification. You must report the test results to EPA, and provide a copy to the State, as specified in 40 CFR 141.35.

(ii) *Small systems.* If your system serves 10,000 or fewer persons, you must collect samples in accordance with the instructions sent to you by the State or EPA, or, if informed by the State or EPA that the State or EPA will collect the sample, you must assist the State or EPA in identifying the appropriate sampling locations and in taking the samples. EPA will report the test results to you and the State.

(8) *What is a violation of this Rule?* (i) Any failure to monitor in accordance with § 141.40(a)(3) through (7) and Appendix A is a monitoring violation. (ii) Any failure to report in accordance with § 141.35 is a reporting violation.

(b) *Requirements for State and Tribal Participation.* (1) How can I, as the director of a State or Tribal drinking water program, participate in unregulated contaminant monitoring, including Assessment Monitoring (which includes the State Monitoring Plan for small systems), the Screening Surveys, and Pre-Screen Testing of all systems? You can enter into a Memorandum of Agreement (MOA) with the EPA that describes your State's or Tribe's activities to:

(i) *Accept or modify the initial plan.* EPA will first specify the systems serving 10,000 or fewer persons by water source and size in an initial State Monitoring Plan for each State using a random number generator. EPA will also generate a replacement list of systems for systems that may not have been correctly specified on the initial plan. This initial State Monitoring Plan will also indicate the year and day, plus or minus two (2) weeks from the day, that each system must monitor for the contaminants in List 1 of Table 1 of this section, Unregulated Contaminant Monitoring Regulation (1999) List. EPA will provide you with the initial monitoring plan for your State or Tribe, including systems to be Index systems and those systems to be part of the Screening Surveys. Within sixty (60) days of receiving your State's initial plan, you may notify EPA that you either accept it as your State Monitoring Plan or request to modify the initial plan by removing systems that have closed, merged or are purchasing water from another system and replacing them with other systems. Any purchased water system associated with a non-purchased water system must be added to the State Monitoring Plan if the State determines that its distribution line is the location of the maximum residence time or lowest disinfectant residual of the combined distribution system. In this case, the purchased water system must monitor for the contaminants for which the "distribution system" is identified as the point of "maximum residence time" or "lowest disinfectant residual," depending on the contaminant, and not the community water system selling water to it. You must replace any systems you removed from the initial plan with systems from the replacement list in the order they are listed. Your request to modify the initial plan must include the modified plan and the reasons for the removal and replacement of systems. If you believe that there are reasons other than those previously listed for removing and replacing one or more other systems from the initial plan, you may include those systems and their replacement systems in your request to modify the initial plan. EPA will review your request to modify your State's initial plan. Please note that information about the actual or potential occurrence or non-occurrence of contaminants at a system or a system's vulnerability to contamination is not a basis for removal from or addition to the plan.

(ii) *Determine an alternate vulnerable time.* Within 60 days of receiving the initial State Monitoring Plan, you may also determine that the most vulnerable time of the year for any or all of the systems in the plan, and for any of the large systems that must monitor, is some period other than May 1 through July 31. If you make this determination, you must modify the initial plan to indicate the alternate vulnerable time and to which systems the alternate vulnerable time applies. EPA will review these determinations when you submit your request to modify your State's initial monitoring plan to the EPA. You must notify the small system(s) in your final State Monitoring Plan and the large system(s) of the most vulnerable time(s) of the year that you have specified for them to sample for one of their sampling events. You must notify them at least 90 days before their first unregulated contaminant sampling is to occur. You may need to consider the timing of monitoring in paragraph (b)(1)(iii) of this section.

(iii) *Modify the timing of monitoring.* Within sixty (60) days of receiving the initial plan, you may also modify the plan by selecting an alternative year and day, plus or minus two (2) weeks, within the years specified in column 6, List 1 of Table 1, Unregulated Contaminant Monitoring Regulation (1999) List, in paragraph (a)(3) of this section, for monitoring for each system in the initial plan as long as approximately one-third of the systems in the State Plan monitor in each of the three (3) years listed. This monitoring may be coordinated with regulated contaminant compliance monitoring at your discretion. You must send the modified plan to EPA.

(iv) *Identify alternate sampling points for small systems in the State Monitoring Plan.* All systems are required to monitor for the contaminants at the sampling locations specified in column 5, List 1 of Table 1, Unregulated Contaminant Monitoring Regulation (1999) List, in paragraph (a)(3) of this section, unless the State specifies an alternate compliance sampling point as the sampling location.

If the compliance sampling points for the small systems in the State Monitoring Plan are different than those specified in paragraph (a)(3) of this section, then you must indicate these sampling points in the plan. These alternative sampling points must allow proper sampling and testing for the unregulated contaminants.

(v) *Notify small and large systems of their monitoring responsibilities.* You must provide notification to systems in the plan and, where appropriate, the large systems, at least ninety (90) days before sampling must occur.

(vi) *Provide instructions to systems that are part of the final State Monitoring Plan.* You must send a monitoring schedule to each system listed in the State Monitoring Plan and instructions on location, frequency, timing of sampling, use of sampling equipment, and handling and shipment of samples based on these regulations. EPA will provide you with guidance for these instructions. If you perform the sampling or make alternative arrangements for the sampling at the systems in the plan, you must inform EPA at least six (6) months before the first monitoring is to occur and address the alternative monitoring arrangements in the MOA.

(vii) *Participate in monitoring for the Screening Surveys for small and large systems.* Within 120 days prior to sampling, EPA will notify you which systems have been selected to participate in the Screening Surveys, the sampling dates, the designated laboratory for testing, and instructions for sampling. You must review the small systems that EPA selected for the State Monitoring Plan to ensure that the systems are not closed, merged or purchasing water from another system (unless the system is to conduct microbiological contaminant monitoring), and then make any replacements in the plan, as described in paragraph (b)(1)(i) of this section. You must notify the selected systems in your State of these Screening Surveys requirements. You must provide the necessary Screening Surveys information to the selected systems at least ninety (90) days prior to the sampling date.

(viii) *Participate in monitoring for Pre-Screen Testing for small and large systems.* You can participate in Pre-Screen Testing in two ways.

(A) First, within ninety (90) days of EPA's letter to you concerning initiation of Pre-Screen Testing for specific contaminants, you can identify from five (5) up to twenty-five (25) systems in your State that you determine to be representative of the most vulnerable systems to these contaminants, modify your State Monitoring Plan to include these most vulnerable systems if any serve 10,000 or fewer persons, and notify EPA of the addition of these systems to the State Plan. These systems must be selected from all community and non-transient noncommunity water systems. EPA will use the State-identified vulnerable systems to select up to 200 systems nationally to be monitored considering the characteristics of the contaminants, precipitation, system operation, and environmental conditions.

(B) Second, within 120 days prior to sampling, EPA will notify you which systems have been selected, sampling dates, the designated laboratory for testing of samples for systems serving 10,000 or fewer persons and approved laboratories for systems serving more than 10,000 persons, and instructions for sampling. You must notify the owners or operators of the selected systems in your State of these Pre-Screen Testing requirements. At least ninety (90) days prior to the sampling date, you must provide the necessary Pre-Screen Testing information to the owners or operators of the selected systems and then inform EPA that you took this action to allow sufficient time for EPA to ensure laboratory readiness.

(ix) *Revise system's treatment plant location(s) to include latitude and longitude.* For reporting to the Safe Drinking Water Information System, EPA already requires reporting of either the latitude and longitude or the street address for the treatment plant location. If the State enters into an MOA, the State must report each system's treatment plant location(s) as latitude and longitude (in addition to street address, if previously reported) by the time of the system's reporting of Assessment Monitoring results to the National Drinking Water Contaminant Occurrence Database.

(2) What if I decide not to participate in an MOA? If you decide not to enter into an MOA with EPA to develop the State Monitoring Plan for small systems, the initial monitoring plan that EPA sent you will become the final State Monitoring Plan for your State or Tribe. In that case, you may still notify each public water system of its selection for the plan and instructions for monitoring as long as you notify EPA that you will be undertaking this responsibility at least six (6) months prior to the first unregulated contaminant monitoring.

(3) Can I add contaminants to the Unregulated Contaminant Monitoring List? Yes, the SDWA allows Governors of seven (7) or more States to petition the EPA Administrator to add one or more contaminants to the Unregulated Contaminant Monitoring Regulation (1999) List, in paragraph (a)(3) of this section. The petition must clearly identify the reason(s) for adding the contaminant(s) to the monitoring list in paragraph (a)(3) of this section, including the potential risk to public health, particularly any information that might be available regarding disproportional risks to the health and safety of children, the expected occurrence documented by any available data, any analytical methods known or proposed to be used to test for the contaminant(s), and any other information that could assist the Administrator in determining which contaminants present the greatest public health concern and should, therefore, be included on the Unregulated Contaminant Monitoring Regulation (1999) List, in paragraph (a)(3) of this section.

(4) Can I waive monitoring requirements? Only with EPA approval and under very limited conditions. Conditions and procedures for obtaining the only type of waiver available under these regulations are as follows:

(i) Application. You may apply to EPA for a State-wide waiver from the unregulated contaminant monitoring requirements for public water systems serving more than 10,000 persons. To apply for such a waiver, you must submit an application to EPA that includes the following information:

(A) the list of contaminants on the Unregulated Contaminant Monitoring List for which you request a waiver, and

(B) documentation for each contaminant in your request demonstrating that the contaminants have not been used, applied, stored, disposed of, released, naturally present or detected in the source waters or distribution systems in your State during the past 15 years, and that it does not occur naturally in your State.

(ii) Approval. EPA will notify you if EPA agrees to waive monitoring requirements.

Appendix A to § 141.40—Quality Control Requirements for Testing All Samples Collected

Your system must ensure that the quality control requirements listed below for testing of samples collected and submitted under § 141.40 are followed:

(1) Sample Collection/Preservation. Follow the sample collection and preservation requirements for the specified method for each of the contaminants in Table 1, UCMR (1999) List, in paragraph (a)(3) of this section. These requirements specify sample containers, collection, dechlorination, preservation, storage, sample holding time, and extract storage and/or holding time that the laboratory must follow.

(2) Method Detection Limit. Calculate the laboratory method detection limit (MDLs) for each contaminant in Table 1, Unregulated Contaminant Monitoring Regulation (1999) List, of paragraph (a)(3) of this section using the appropriate specified method according to procedures in 40 CFR Part 136, Appendix B with the exception that the contaminant concentration used to fortify reagent water must be less than or equal to the minimum reporting level (MRL) for the contaminants as specified in column 4, Table 1, UCMR (1999) List, in paragraph (a)(3) of this section. The calculated MDL is equal to the standard deviation times the Student's T value for 99% confidence level with n-1 degrees of freedom. (The MDL must be less than or equal to one-half of the MRL.)

(3) Calibration. Follow the initial calibration requirements as specified in the method utilized. Calibration must be verified initially with a low-level standard at a concentration at or below the MRL for each contaminant. Perform a continuing calibration verification following every 10th sample. The calibration verification must be performed by alternating low-level and mid-level calibration standards. The low-level standard is defined as a concentration at or below the MRL with an acceptance range of ±40%. The mid-level standard is in the middle of the calibration range with an acceptance range of ±20%.

(4) Reagent Blank Analysis. Analyze one laboratory reagent (method) blank per sample set/batch that is treated exactly as a sample. The maximum allowable background concentration is one-half of the MRL for all contaminants. A field reagent blank is required only for EPA Method 524.2 (or equivalent listed methods, D5790.95, SM6210D, and SM6200B).

(5) Quality Control Sample. Obtain a quality control sample from an external source to check laboratory performance at least once each quarter.

(6) Matrix Spike and Duplicate. Prepare and analyze the sample matrix spike (SMS) for accuracy and matrix spike duplicate (MSD) samples for precision to determine method accuracy and precision for all contaminants in Table 1, Unregulated Contaminant Monitoring Regulation (1999) List, in paragraph (a)(3) of this section. SMS/MSD samples must be prepared and analyzed at a frequency of 5% (or one SMS/MSD set per every 20 samples) or with each sample batch whichever is more frequent. In addition, the SMS/MSD spike concentrations must be alternated between a low-level spike and mid-level spike approximately 50% of the time. (For example: a set of 40 samples will require preparation and analysis of two SMS/MSD sets. The first set must be spiked at either the low-level or mid level, and the second set must be spiked with the other standard, either the low-level or mid-level, whichever was not used for the initial SMS/MSD set). The low-level SMS/MSD spike concentration must be within ±20% of the MRL for each contaminant. The mid-level SMS/MSD spike concentration must be within ±20% of the mid-level calibration standard for each contaminant, and should represent, where possible, an approximate average concentration observed in previous analyses of that analyte. The spiking concentrations must be reported in the same units of measure as the analytical results.

(7) Internal Standard Calibration. As appropriate to a method's requirements to be used, test and obtain an internal standard for the methods for each chemical contaminant in Table 1, Unregulated Contaminant Monitoring Regulation (1999) List, in paragraph (a)(3) of this section, a pure contaminant of known concentration, for calibration and quantitation purposes. The methods specify the percent recovery or response that you must obtain for acceptance.

(8) Method Performance Test. As appropriate to a method's requirements, test for surrogate compounds, a pure contaminant unlikely to be found in any sample, to be used to monitor method performance. The methods specify the percent recovery that you must obtain for acceptance.

(9) Detection Confirmation. Confirm any chemical contaminant detected above the MRL by gas chromatographic/mass spectrometric (GC/MS) methods. If testing resulted in first analyzing the sample extracts via specified gas chromatographic methods, an initial confirmation by a second column dissimilar to the primary column may be performed. If the contaminant detection is confirmed by the secondary column, then the contaminant must be reconfirmed by GC/MS using three (3) specified ion peaks for contaminant identification. Use one of the following confirming techniques: perform single point calibration of the GC/MS system for confirmation purposes only as long as the calibration standard is at a concentration within ± 50% of the concentration determined by the initial analysis; or perform a three (3) point calibration with single point daily calibration verification of the GC/MS system regardless of whether that verification standard concentration is within ± 50% of sample response. If GC/MS analysis confirms the initial contaminant detection, report results determined from the initial analysis.

(10) Reporting. Report the analytical results and other data, with the required data listed in 40 CFR 141.35, Table 1. Report this data electronically to EPA, unless EPA specifies otherwise, and provide a copy to the State. Systems must coordinate with their laboratories for electronic reporting to EPA to ensure proper formatting and timely data submission.

PART 142—NATIONAL PRIMARY DRINKING WATER REGULATIONS IMPLEMENTATION

1. The authority citation for part 142 continues to read as follows:

Authority: 42 U.S.C. 300f, 300g-1, 300g-2, 300g-3, 300g-4, 300g-5, 300g-6, 300j-4, 300j-9, and 300j-11.

§ 142.15 [Amended]

2. Section 142.15 is amended by removing and reserving paragraph (c)(3).

3. Section 142.16 is amended by revising paragraphs (e) introductory text, (e)(1) introductory text, and (e)(1)(i)(C) to read as follows:

§ 142.16 Special primacy requirements.

* * * * *

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

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

(i) * * *

(C) The State decision criteria, including the factors that will be considered in deciding to grant or deny waivers. The decision criteria must include the factors specified in §§ 141.24(f)(8) and 141.24(h)(6).

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