

EPAX EPA  
9201- 810  
0034 1991.1  
✓

DRAFT FINAL

United States Environmental Protection Agency  
Office of Ground Water and Drinking Water  
401 M Street, S.W.  
Washington, DC 20460

# 25173403

## Phase II Implementation Guidance

Federal Reporting Data System (FRDS) Reporting

November 25, 1991

JAN 29 1992

HEADQUARTERS LIBRARY  
ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C. 20460



## Table of Contents

	<u>Page No.</u>
Introduction . . . . .	1
Part 1: Definitions and Significant FRDS Reporting Issues	1 - 1
A. Definitions . . . . .	1 - 1
1. Compliance Period . . . . .	1 - 1
2. Compliance Cycle . . . . .	1 - 1
3. Maximum Contaminant Level (MCL) Violation . . . . .	1 - 2
a. Single Sample MCL Violation . . . . .	1 - 2
b. Average MCL Violation . . . . .	1 - 3
4. Monitoring and Reporting (M&R) Violation . . . . .	1 - 4
a. Major M&R Violation . . . . .	1 - 4
b. Minor M&R Violation . . . . .	1 - 4
c. Regular Sampling M&R Violation . . . . .	1 - 5
d. Confirmation Sampling M&R Violation . . . . .	1 - 5
5. Treatment Technique Violation . . . . .	1 - 5
6. Federal Violation . . . . .	1 - 5
a. Federal MCL Violation . . . . .	1 - 5
b. Federal M&R Violation . . . . .	1 - 6
c. Federal Treatment Technique Violation . . . . .	1 - 6
7. State Violation . . . . .	1 - 6
a. State MCL Violation . . . . .	1 - 7
b. State M&R Violation . . . . .	1 - 7
c. State Treatment Technique Violation . . . . .	1 - 8
8. Group Contaminant Code . . . . .	1 - 8
B. Significant FRDS Reporting Issues . . . . .	1 - 8
1. Reporting Federal versus State Violations . . . . .	1 - 8
2. Reporting Federal and State Enforcement Actions . . . . .	1 - 9
3. Reporting Violations by Sampling Point versus by System . . . . .	1 - 9
a. Reporting Violations by Sampling Point . . . . .	1 - 10
b. Reporting Violations by System . . . . .	1 - 11
4. Utilization of Group Contaminant Codes . . . . .	1 - 12
5. Multiple MCL and/or M&R Violations for the same Contaminant and Monitoring Period . . . . .	1 - 14
a. Multiple MCL Violations . . . . .	1 - 15
b. Multiple M&R Violations . . . . .	1 - 16
c. MCL and M&R Violation Combinations . . . . .	1 - 17
i. Scenario #1 - One MCL and One M&R . . . . .	1 - 17
ii. Scenario #2 - Two MCL and One M&R . . . . .	1 - 18
iii. Scenario #3 - One MCL and Two M&R . . . . .	1 - 20
Part 2: Reporting to FRDS . . . . .	2 - 1
A. Data that must be Reported for ALL Violations . . . . .	2 - 1
1. Data Elements and Descriptions . . . . .	2 - 1

## Table of Contents (Continued)

	<u>Page No.</u>
2. Violation Types . . . . .	2 - 1
3. Monitoring Period Begin Date and Months . . . . .	2 - 2
4. Source/Entity ID and Designating <u>Sampling</u> <u>Point</u> versus <u>System</u> Specific Reporting . . . . .	2 - 3
5. Format of Violations Reported . . . . .	2 - 4
B. Additional Data that must be Reported for M&R Violations . . . . .	2 - 4
1. Data Elements and Descriptions . . . . .	2 - 4
2. Major versus Minor . . . . .	2 - 4
3. Major M&R Violation Reporting . . . . .	2 - 6
4. <u>Major Confirmation Sampling M&amp;R Violation</u> Example . . . . .	2 - 7
5. Minor M&R Violation Reporting . . . . .	2 - 9
6. <u>Minor Regular Sampling M&amp;R Violation Example</u> . . . . .	2 - 10
C. Additional Data that must be Reported for MCL Violations . . . . .	2 - 12
1. Data Elements and Descriptions . . . . .	2 - 12
2. MCL Violation Reporting . . . . .	2 - 13
3. <u>Average MCL Violation Reporting Example</u> . . . . .	2 - 14
D. Additional Data that must be Reported for Treatment Technique Violations . . . . .	2 - 16
1. Data Elements and Descriptions . . . . .	2 - 16
2. Treatment Technique Violation Reporting . . . . .	2 - 17
3. Treatment Technique Violation Reporting Example . . . . .	2 - 18

## Appendix A: Phase II Contaminants

A. Inorganic Contaminants (IOCs) . . . . .	A - 1
B. Phase II Unregulated Inorganic Contaminants . . . . .	A - 1
C. Synthetic Organic Contaminants (SOCs) . . . . .	A - 2
D. Volatile Organic Contaminants (VOCs) . . . . .	A - 3
E. Water Treatment Chemicals . . . . .	A - 4
F. Phase II Unregulated Organic Contaminants . . . . .	A - 4

## Appendix B: Group Contaminant Code Utilization

Timetable . . . . .	B - 1
Rules for Use . . . . .	B - 2
Inorganic Contaminant GCCs	
1*** . . . . .	B - 2
Volatile Organic Contaminant GCCs	
2V07 . . . . .	B - 2
2V08 . . . . .	B - 2
2V10 . . . . .	B - 2
2V17 . . . . .	B - 2
2V18 . . . . .	B - 2
Synthetic Organic Contaminant GCCs	

## Table of Contents (Continued)

	<u>Page No.</u>
2*** . . . . .	B - 3
2S13 . . . . .	B - 3
2S18 . . . . .	B - 3
Unregulated Contaminant GCCs	
2U15 . . . . .	B - 3
2U34 . . . . .	B - 3
2U36 . . . . .	B - 3
1U06 . . . . .	B - 3
2U24 . . . . .	B - 3
 Appendix C: Phase II Compliance Determination Flowcharts	
Introduction . . . . .	C - 1
MCL Compliance Determination	
Nitrate & Nitrite . . . . .	C - 2
IOC (other than Nitrate & Nitrite), SOC, and VOC	C - 3
M&R Compliance Determination	
IOCs	
Asbestos - Groundwater & Surface Water systems . . . . .	C - 4
Fluoride - Groundwater systems . . . . .	C - 5
Fluoride - Surface Water systems . . . . .	C - 6
Nitrate - Groundwater systems . . . . .	C - 7
Nitrate - Surface Water systems . . . . .	C - 8
Nitrite - Groundwater & Surface Water systems . . . . .	C - 9
IOC (other than Asbestos, Fluoride, Nitrate, Nitrite) - Groundwater systems . . . . .	C - 10
IOC (other than Asbestos, Fluoride, Nitrate, Nitrite) - Surface Water systems . . . . .	C - 11
SOCs	
Serving > 3,300 Persons	
- Groundwater & Surface Water systems . . . . .	C - 12
Serving ≤ 3,300 Persons	
- Groundwater & Surface Water systems . . . . .	C - 13
VOCs	
Groundwater systems . . . . .	C - 14
Surface Water systems . . . . .	C - 15
Unregulated Contaminants	
Inorganic Contaminants - Groundwater & Surface Water systems . . . . .	C - 16
Organic Contaminants - Groundwater & Surface Water systems . . . . .	C - 17
Treatment Technique Compliance Determination . . . . .	C - 18
 Appendix D: Standardized Monitoring Framework	

DRAFT FINAL

Table of Contents (Continued)

Page No.

Appendix E: Summary of Phase II Regulations

## List of Figures

<u>Figure</u>	<u>Description</u>	<u>Page No.</u>
1	Group Contaminant Code Utilization Timetable . . . . .	1 - 13
2	<u>Major Confirmation Sampling</u> M&R Violation - FRDS-II Data Capture Form . . . . .	2 - 8
3	<u>Major Confirmation Sampling</u> M&R Violation - FRDS-II DTF Transactions . . . . .	2 - 8
4	<u>Minor Regular Sampling</u> M&R Violation - FRDS-II Data Capture Form . . . . .	2 - 11
5	<u>Minor Regular Sampling</u> M&R Violation - FRDS-II DTF Transactions . . . . .	2 - 11
6	<u>Average MCL Violation</u> - FRDS-II Data Capture Form . . . . .	2 - 15
7	<u>Average MCL Violation</u> - FRDS-II DTF Transactions . . . . .	2 - 15
8	Treatment Technique Violation - FRDS-II Data Capture Form . . . . .	2 - 19
9	Treatment Technique Violation - FRDS-II DTF Transactions . . . . .	2 - 19





## Introduction

This document is a supplement to the Phase II Implementation Guidance manual and addresses reporting to the Federal Reporting Data System (FRDS). It describes in detail the technical aspects and data requirements for reporting violations of the Phase II regulations to FRDS and incorporates revisions made as a result of EPA and State comments received on the draft version of the document. For complete understanding, this document should be utilized in conjunction with the Phase II regulations, the Phase II Implementation Guidance manual, and the FRDS-II Data Element Dictionary and Data Entry Instructions documentation.

The effective date for this FRDS reporting guidance will coincide with the effective date of the Standardized Monitoring Framework (SMF), January 1, 1993. Prior to that date, existing reporting guidance, methodology, and procedure apply. Upon its effective date, this document will supersede all previous reporting guidance which relates to the inorganic contaminants (IOCs), synthetic organic contaminants (SOC), volatile organic (SOC) contaminants, and unregulated contaminants specifically addressed herein.

The remainder of this document is divided into two parts and five appendices.

Part 1 contains various definitions (including definitions of the violations to be reported to FRDS), and addresses several significant FRDS reporting issues. Part 2 specifically identifies what to report to FRDS for Monitoring and Reporting (M&R) violations, Maximum Contaminant Level (MCL) violations, and Treatment Technique violations.

Appendix A contains a list of the contaminants (and their FRDS contaminant identification codes<sup>1</sup>) which are covered by this FRDS reporting guidance. Appendix B contains a list of FRDS Group Contaminant Codes (GCCs) that may be used in reporting certain types of regular sampling M&R violations to FRDS. Appendix C contains compliance determination flowcharts which portray MCL, M&R, and Treatment Technique compliance determination for the IOCs, SOCs, VOCs, water treatment chemicals, and unregulated contaminants. Appendices D and E contain copies of the Standardized Monitoring Framework

---

<sup>1</sup> Refer to the FRDS-II Data Element Dictionary, Section VI.C, table ID06, for a list of ALL FRDS contaminant identification codes.

(Illustrated by Little Tiny Squares), and a Summary of Phase II Regulations<sup>2</sup>.

Appendices D and E are of special significance. Therein, the Standardized Monitoring Framework and the Phase II regulation are summarized. These appendices have been added to this final FRDS reporting guidance as replacements for numerous sections contained in the draft version of this document which addressed the same issues. These summaries include, but are not necessarily limited to, the following for the Phase II IOCs, SOCs, VOCs, and unregulated contaminants:

- systems affected
- sampling points
- initial and repeat base sampling requirements
- grandfathering of previously collected analytical data
- triggers for increased/decreased sampling
- confirmation sampling requirements
- compositing procedures and requirements
- MCL compliance determination
- public notification requirements
- waiver procedures
- graphic representations of monitoring under the standard monitoring framework, by contaminant
- flowcharts depicting an overview of the monitoring requirements, by contaminant

---

<sup>2</sup> "Summary of Phase II Regulations, National Primary Drinking Water Regulations for 38 Inorganic and Synthetic Organic Chemicals," Office of Ground Water and Drinking Water, U.S. Environmental Protection Agency, Washington, DC, July, 1991.

**Part 1: Definitions and Significant FRDS Reporting Issues**

**A. Definitions**

**1. Compliance Period**

Compliance period can have two distinct definitions, one definition when we refer to the Standardized Monitoring Framework (SMF), and a completely separate definition when we refer to FRDS.

Under the SMF, a compliance period means a three-year period of time (calendar year based) within a nine-year compliance cycle. The first compliance period of the first compliance cycle begins 01/01/93 and ends 12/31/95, the second compliance period of the first compliance cycle begins 01/01/96 and ends 12/31/98, and the third compliance period of the first compliance cycle begins 01/01/99 and ends 12/31/2001. Refer to Appendix E, Fact Sheet 1, for additional information.

In FRDS, a compliance period means the period of time during which monitoring was to have been performed, such as a quarter, a year, etc. For example, assume a public water system (PWS) is required to monitor for contaminant X each calendar quarter. If this PWS fails to conduct the required monitoring for contaminant X for the first calendar quarter of 1993, a regular sampling M&R violation is incurred. When this M&R violation is reported to FRDS, the State must supply the beginning date of the compliance period, and either the ending date of the compliance period or the duration of the compliance period. The beginning date of the compliance period in this example would be 01/01/93, the ending date of the compliance period would be 03/31/93, and the duration of the compliance period would be 3 months.

In an effort to eliminate the confusion between the SMF compliance period and the FRDS compliance period in this document, the FRDS compliance period will be hereafter referred to as a monitoring period.

**2. Compliance Cycle**

A nine-year period of time (calendar year based) which consists of three three-year compliance periods. The first compliance cycle begins 01/01/93 and ends 12/31/2001. Refer to Appendix E, Fact Sheet 1, for additional information.

### 3. Maximum Contaminant Level (MCL) Violation

Determination of MCL violations is fully defined in the regulations (i.e., the analytical result of a single sample exceeding the MCL, the average analytical result of an initial and a confirmation sample exceeding the MCL, or a running annual average analytical result exceeding the MCL).

Refer to §§141.23(i)(1) and 141.23(i)(2) for asbestos, barium, cadmium, chromium, fluoride, mercury, and selenium MCL compliance determination; §141.23(i)(3) for nitrate and nitrite; §§141.24(f)(15)(i) and 141.24(f)(15)(ii) for the VOCs; and §§141.24(h)(11)(i) and 141.24(h)(11)(ii) for the SOCs. In addition, Fact Sheets 2 through 8 in Appendix E summarize the MCL compliance determination process, by contaminant, under the heading Compliance Determination.

#### a. Single Sample MCL Violation

When a maximum contaminant level violation is based on the result of a single sample, it is known as a single sample MCL violation (FRDS violation type 01).

A single sample MCL violation may be incurred in four ways:

1. When a confirmation sample is NOT required<sup>3</sup> and the PWS is monitoring on an annual or less frequent basis<sup>4</sup> (e.g., every three years);
2. When a confirmation sample is required, but NOT taken at all;
3. When a confirmation sample is required and taken, but NOT taken within the required period of time<sup>5</sup>; or

---

<sup>3</sup> The NPDES require confirmation samples for nitrate and nitrite only. For IOCs other than nitrate and nitrite, the SOCs, and the VOCs, the State may require confirmation samples.

<sup>4</sup> See §141.23(i)(2) for the IOCs other than nitrate and nitrite; §141.24(f)(15)(ii) for the VOCs; and §141.24(h)(11)(ii) for the SOCs.

<sup>5</sup> Here, "required period of time" means 24 hours for nitrate and nitrite; as soon as possible (but not exceeding two weeks) for the IOCs other than nitrate and nitrite; or as specified by the State for the SOCs and VOCs.

4. When a confirmation sample is required and taken, but NOT analyzed and/or reported within the required period of time<sup>6</sup>.

If a confirmation sample is required, determination of MCL compliance is to be based on the average of the initial and confirmation sample results<sup>7</sup>. However, if a confirmation sample result is not available, it cannot be averaged with the initial sample result. Therefore, by default, determination of MCL compliance would be based on a single sample result (the initial samples' result itself).

**b. Average MCL Violation**

When a maximum contaminant level violation is based on the average of more than one sample result, it is known as an average MCL violation (FRDS violation type 02).

An average MCL violation may be incurred in four ways:

1. When the average of an initial and confirmation sample result for nitrate exceed the nitrate MCL;
2. When the average of an initial and confirmation sample result for nitrite exceed the nitrite MCL;
3. When the PWS is monitoring more frequently than annual (e.g., quarterly) for any contaminant other than nitrate and nitrite; and the running annual average of all samples taken for the subject contaminant exceeds that contaminant's MCL<sup>8</sup>; or

---

<sup>6</sup> Here, "required period of time" means as specified by the State.

<sup>7</sup> See §§141.23(f)(2), 141.23(f)(3), and 141.23(i)(3) for nitrate and nitrite; §§141.23(f)(3) and 141.23(i)(2) for IOCs other than nitrate and nitrite; §141.24(f)(15)(i) for the VOCs; and §141.24(h)(11)(i) for the SOCs.

<sup>8</sup> See §141.23(i)(2) for the IOCs other than nitrate and nitrite; §141.24(f)(15)(i) for the VOCs; and §141.24(h)(11)(i) for the SOCs.

4. When the PWS is monitoring on an annual or less frequent basis<sup>9</sup> (e.g., every three years); a confirmation sample is required<sup>10</sup> by the State for any contaminant other than nitrate and nitrite; and the average of an initial and confirmation sample for the subject contaminant exceed that contaminant's MCL.

#### 4. Monitoring and Reporting (M&R) Violation

An M&R violation is a failure to:

- Complete the initial round of sampling;
- Conduct any repeat sampling;
- Conduct confirmation sampling, when required; or
- Accurately report the analytical result of a regular or confirmation sample to the State.

The Standardized Monitoring Framework illustrations in Appendix D and Fact Sheets 2 through 8 in Appendix E summarize the individual monitoring requirements by contaminant.

##### a. Major M&R Violation

A major M&R violation is defined as, "a monitoring or reporting violation in which no samples were collected and/or reported."

##### b. Minor M&R Violation

A minor M&R violation is defined as, "a monitoring or reporting violation in which some, but not all, of the samples required to be collected and reported were actually collected and/or reported."

---

<sup>9</sup> See §141.23(i)(2) for the IOCs other than nitrate and nitrite; §141.24(f)(15)(ii) for the VOCs; and §141.24(h)(11)(ii) for the SOCs.

<sup>10</sup> The NPDRs require confirmation samples for nitrate and nitrite only. For IOCs other than nitrate and nitrite, the SOCs, and the VOCs, the State may require confirmation samples.

**c. Regular Sampling M&R Violation**

Failure to complete the initial round of sampling, failure to conduct any repeat sampling, and failure to accurately report the analytical result of a regular sample from either the initial or any repeat sampling round, is known as a regular sampling M&R violation (FRDS violation type 03).

**d. Confirmation Sampling M&R Violation**

Failure to conduct any required confirmation sampling and failure to accurately report the analytical result of a confirmation sample is known as a confirmation sampling M&R violation (FRDS violation type 04).

**5. Treatment Technique Violation**

Public water systems which use acrylamide or epichlorohydrin as a means of drinking water treatment are required to certify annually to the State that these chemicals are being used as directed by the manufacturer or distributor.

A Treatment Technique violation is a failure to certify annually that acrylamide and/or epichlorohydrin have been properly used (FRDS violation type 07).

**6. Federal Violation**

A Federal violation is a violation incurred as a result of the application of any National Primary Drinking Water Regulation (NPDWR). } 2

**a. Federal MCL Violation**

Federal MCL violations are those incurred utilizing:

1. The MCL determination procedures defined in §§141.23(i)(1) and 141.23(i)(2) for asbestos, barium, cadmium, chromium, fluoride, mercury, and selenium; §141.23(i)(3) for nitrate and nitrite; §§141.24(f)(15)(i) and 141.24(f)(15)(ii) for the VOCs; and

§§141.24(h)(11)(i) and 141.24(h)(11)(ii) for the SOCs;

- and -

2. The MCLs defined in §§141.11 or 141.62(b) (as appropriate) for the IOCs; §141.61(a) for the VOCs; and §141.61(c) for the SOCs.

**b. Federal M&R Violation**

Federal M&R violations are those incurred utilizing the sampling and analytical requirements defined in §141.23 for the IOCs; §141.24 for the VOCs and SOCs; and §141.40 for the unregulated contaminants.

**c. Federal Treatment Technique Violation**

Federal Treatment Technique violations are those incurred utilizing the requirements defined in §141.111 for acrylamide and epichlorohydrin.

**7. State Violation**

A violation which is solely a State violation is:

1. A violation incurred as a result of the application of any State Drinking Water Regulation, if said State Drinking Water Regulation is similar to, but more stringent than, a National Primary Drinking Water Regulation (NPDWR);

- and -

2. A violation incurred as a result of the application of any State Drinking Water Regulation that represents a requirement for which no equivalent NPDWR exists.

If a State Drinking Water Regulation is identical to a NPDWR, a violation incurred as a result of the application of said State Drinking Water Regulation is both a Federal violation and a State violation.



**a. State MCL Violation**

MCL violations which are solely State MCL violations are generally those incurred as a result of an MCL which is more stringent than the equivalent NPDWR MCL, those incurred as a result of an MCL being established for a type of system for which no Federal MCL exists (e.g., the MCL for fluoride is applicable to CWSS and NTNCWSS in the State)<sup>11</sup>, or those incurred for contaminants which are not Federally regulated.

For example, the NPDWR MCL for cadmium is 0.005 mg/l. Assume a State sets their cadmium MCL at 0.003 mg/l and they do not require confirmation samples when an initial result exceeds the MCL. Therefore, receipt of a sample result of 0.004 mg/l would cause a single sample MCL violation to be incurred. This is solely a State MCL violation since the sample result is below the Federal MCL.

**b. State M&R Violation**

M&R violations which are solely State M&R violations are generally those incurred as a result of more frequent monitoring schedules than established in the NPDWRs, those incurred due to required confirmation sampling for other than nitrate and nitrite, or those incurred for contaminants which are not Federally regulated.

For example, the NPDWRs provide that, "Each public water system shall monitor at the time designated by the State within each compliance period."<sup>12</sup> Assume that a State has determined that a certain community PWS is required to sample for asbestos between 01/01/93 and 12/31/93 (i.e., the first year of the first compliance period). The PWS fails to do so, and, as a result, an M&R violation is incurred. This is solely a State M&R violation since the NPDWR gives the PWS until 12/31/95 to collect the required asbestos sample. A Federal M&R violation would be incurred only if the CWS fails to collect the asbestos sample by 12/31/95 (i.e., during the first compliance period of each compliance cycle).

<sup>11</sup> The NPDWR for fluoride is applicable to CWSS only.

<sup>12</sup> See §141.23(j) for IOCs, §141.24(f)(21) for the VOCs, and §141.24(h)(17) for the SOCs.

**c. State Treatment Technique Violation**

Treatment Technique violations which are solely State Treatment Technique violations are generally those incurred as a result of requiring more frequent certification for acrylamide or epichlorohydrin usage than is established in the NPDWRs, or those incurred for contaminants which are not Federally regulated.

For example, assume a State requires monthly certification of fluoride usage. A PWS required to provide this monthly fluoride certification fails to do so, and, as a result, a Treatment Technique violation is incurred. This is a solely a State Treatment Technique violation since no NPDWR exists that requires certification of fluoride usage.

**8. Group Contaminant Code**

A Group Contaminant Code (GCC) is a special contaminant identification code which is used when reporting a group of related regular sampling M&R violations to FRDS. A GCC may be reported to FRDS when no monitoring for any contaminant from the related group (e.g., VOCs) has been performed.

For example, GCC 1U06 represents the unregulated inorganic contaminants -- antimony, beryllium, cyanide, nickel, sulfate, and thallium. If a PWS required to monitor for these unregulated contaminants fails to do so, a regular sampling M&R violation has been incurred for each of the six contaminants. Rather than reporting six separate regular sampling M&R violations to FRDS with identical information except for the contaminant ID, one regular sampling M&R violation may be reported with 1U06 specified as the contaminant ID. FRDS recognizes 1U06 as a GCC and generates six individual regular sampling M&R violations for insertion into the Data Base, one for each of the contaminants represented by 1U06.

**B. Significant FRDS Reporting Issues**

**1. Reporting Federal versus State Violations**

States must report **ONLY** Federal violations to FRDS. Violations that are the result of more stringent State MCLs, more stringent State sampling frequencies, or for

contaminants not regulated at the Federal level, etc. should NOT be reported to FRDS. The previous section of this document contains the definition of a Federal violation on page 1 - 5 and a State violation on page 1 - 6.

It is important to note that it is not always possible for EPA to identify whether a violation reported represents a violation of a State rule only or both State and Federal rules. Thus, it is incumbent upon the State to report Federal violations only. Failure to comply with this requirement will translate into more PWSS being identified as violators in FRDS than are actually in violation of the Federal requirements, and, in the worst case, may result in PWSS being incorrectly classified as a Significant Non-Complier (SNC).

## **2. Reporting Federal and State Enforcement Actions**

States are required to report to FRDS all formal enforcement actions taken in response to Federal violations.

Reporting of informal enforcement actions taken in response to Federal violations is encouraged, but NOT required.

Formal or informal enforcement actions taken in response to violations which are solely State violations may be reported to FRDS, if desired. Such enforcement actions, when reported, will be stored in the FRDS Data Base as "orphan" enforcements (i.e., they are not linked to any violation stored in the FRDS Data Base).

## **3. Reporting Violations by Sampling Point versus by System**

States have the option of reporting violations to FRDS by sampling point, by system, or with a mixture of the two. EPA recommends, however, that the States report violations to FRDS by sampling point.

Since three methods of reporting will be permitted, it is necessary for each violation reported to FRDS to be identified as either sampling point or system specific. This will be accomplished by requiring that the FRDS source/entity ID<sup>13</sup> be supplied for each violation reported.

---

<sup>13</sup> See the FRDS-II Data Element Dictionary documentation, Section II, data element C1143, VIO-SE-ID.

If the source/entity ID reported to FRDS for a violation is greater than zero, the violation will be assumed to be a sampling point specific violation.

If the source/entity ID reported to FRDS for a violation is equal to zero, the violation will be assumed to be a system specific violation.

Regardless of the option a State chooses for reporting violations to FRDS, EPA currently plans on viewing violations on a system, NOT sampling point, specific basis. For our purposes, each system can be in violation only one time, for each type of violation, for each contaminant, for each compliance period -- even though the PWS may have had multiple violations of the same type and for the same contaminant and monitoring period, at multiple sampling points.

a. Reporting Violations by Sampling Point

States choosing to report on a sampling point specific basis for a PWS must report each and every violation which that system incurs, even if it has incurred multiple violations of the same type (e.g., single sample MCL), for the same contaminant and monitoring period, at multiple sampling points. Each must be reported to FRDS.

It must be noted, for the record, that States choosing to report on a sampling point specific basis for PWSs with multiple sampling points will likely incur more major M&R violations than States choosing to report on a system specific basis. As an illustration of this fact, consider the following example:

- PWS has two sources
- Monitoring for benzene is required at both sources
- A benzene sample is taken for source #1, as required, but no sampling is performed for source #2 (a regular sampling M&R violation)
- A State choosing to report on a system specific basis for this PWS would report one minor regular sampling M&R violation for benzene for the subject monitoring period (i.e., some samples were taken, but not all)

- A State choosing to report on a sampling point specific basis for this PWS, on the other hand, would report one major regular sampling M&R violation for benzene for the subject monitoring period (i.e., no sample was taken for source #2)

Major M&R violations are defined on page 1 - 4, and minor M&R violations are defined on page 1 - 4.

b. Reporting Violations by System

States choosing to report on a system specific basis for a PWS would only report one violation of the same type (e.g., regular sampling M&R), per contaminant, per compliance period, even if that system violated the same requirement for the compliance period at more than one sampling point.

It must be noted, for the record, that States choosing to report on a system specific basis for PWSs with multiple sampling points will likely incur fewer major M&R violations than States choosing to report on a sampling point specific basis. As an illustration of this fact, consider the following example:

- PWS has three sources
- Monitoring for EDB is required at all three sources
- An EDB sample is taken for source #1, as required, but no sampling is performed for source #2 (a regular sampling M&R violation) and no sampling is performed for source #3 (a regular sampling M&R violation)
- A State choosing to report on a system specific basis for this PWS would report one minor regular sampling M&R violation for EDB for the subject monitoring period (i.e., some samples were taken, but not all)
- A State choosing to report on a sampling point specific basis for this PWS, on the other hand, would report two major regular sampling M&R violations for EDB for the subject monitoring period (i.e., no sample was taken for source #2 and no sample was taken for source #3)

Major M&R violations are defined on page 1 - 4,  
and minor M&R violations are defined on page 1 - 4.

#### 4. Utilization of Group Contaminant Codes

In response to numerous requests for continued acceptance of Group Contaminant Codes (GCCs), new GCCs have been assigned for the Phase II rule.

GCCs are defined on page 1 - 8, and Appendix B contains a complete list of GCCs, rules for their use, and the individual contaminants belonging to each GCC.

A majority, but not all, of the original inorganic and organic NPDWRs were re-promulgated under the Phase II rule. Additionally, a Phase II provision permits the use of analytical data obtained prior to the Phase II effective date to satisfy initial monitoring requirements. As a result of these two factors, it became necessary to assign new GCCs which sometimes represent contaminants that overlap with contaminants represented by other GCCs. It was also necessary to define acceptable periods of time in which a given GCC can be reported to FRDS. Refer to Figure 1 on page 1 - 13, or the information below for the GCC utilization timetable.

By way of summary, the following describes each GCC (old and new) and the dates during which they may be used.

<u>GCC</u>	<u>New</u>	<u>Description</u>	<u>May be Reported</u>
1***	No	10 Original NPDWR IOCs	Until 12/31/93
2V07	No	7 Phase I VOCs (Excl. vinyl chloride)	Until 12/31/93
2V08	No	8 Phase I VOCs (Incl. vinyl chloride)	Until 12/31/93
2V10	Yes	10 new Phase II VOCs	1/1/93-12/31/96
2V17	Yes	17 Phase I and II VOCs (Excl. vinyl chloride)	1/1/93-?
2V18	Yes	18 Phase I and II VOCs (Incl. vinyl chloride)	1/1/93-?
2***	No	6 Original NPDWR SOCs	Until 12/31/93
2S13	Yes	13 new Phase II SOCs	1/1/93-12/31/96
2S18	Yes	5 Original NPDWR SOCs and 13 new Phase II SOCs	1/1/93-?

Continued on page 1 - 14

Compliance Cycle 1										
Compliance Period 1				Compliance Period 2				Compliance Period 3		
1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001

#### Inorganic Contaminant GCCs

1***										
------	--	--	--	--	--	--	--	--	--	--

#### Volatile Organic Contaminant GCCs

2V07										
2V08										
2V10										
2V17										
2V18										

#### Synthetic Organic Contaminant GCCs

2***										
2S13										
2S18										

#### Unregulated Contaminant GCCs

2U15										
2U34										
2U36										
1U06										
2U24										

Figure 1: Group Contaminant Code Utilization Timetable

Continued from page 1 - 12

<u>GCC</u>	<u>New</u>	<u>Description</u>	<u>May be Reported</u>
2U15	No	15 Phase I Unregulated Contaminants	12/31/92
2U34	No	34 Phase I Unregulated Contaminants (Excl. DBCP and EDB)	12/31/92
2U36	No	36 Phase I Unregulated Contaminants (Incl. DBCP and EDB)	12/31/92
1U06	Yes	6 Phase II Unregulated Inorganic contaminants	1/1/93-12/31/96
2U24	Yes	24 Phase II Unregulated Organic contaminants	1/1/93-12/31/96

When a GCC is input to FRDS, the GCC itself will not be inserted into the Data Base as was previously done with 2V07, 2V08, 2U15, 2U34, and 2U36<sup>14</sup>. Instead, the GCC will spawn multiple violations for insertion into the Data Base (one for each contaminant belonging to the GCC). The spawning of multiple violations for insertion into the Data Base is the procedure currently employed when a 1\*\*\* or 2\*\*\* GCC is input to FRDS.

##### 5. Multiple MCL and/or M&R Violations for the same Contaminant and Monitoring Period

If a PWS has more than one sampling point, it is possible for it to incur multiple MCL and/or M&R violations for the same contaminant and monitoring period since compliance determination is sampling point specific.

Whether or not multiple violations of the same type (e.g., average MCL) are reported to FRDS is dependant upon the violation reporting method being utilized by the State for the PWS. Sampling point specific violation reporting is discussed on page 1 - 10, and system specific violation reporting is discussed on page 1 - 11.

On the other hand, if multiple violations of different types (e.g., an average MCL violation and a regular sampling M&R violation) are incurred for the same contaminant and

<sup>14</sup> Any 2V07, 2V08, 2U15, 2U34, and 2U36 GCCs presently in the FRDS Data Base will be replaced with the individual violations belonging to those GCCs.



monitoring period, both violation types must be reported to FRDS.

Since this is a difficult concept, the following sections present a variety of hypothetical scenarios in which multiple MCL and/or M&R violations are incurred by the same PWS, for the same contaminant and for the same monitoring period.

**a. Multiple MCL Violations**

In this scenario, a PWS incurs two single sample MCL violations at different sampling points for the same contaminant and for the same monitoring period.

- PWS is a NTNCWS
- PWS has two sources, both surface water
- Since surface water is used, PWS is a surface water system
- Monitoring for fluoride is required at each of the two sources annually
- No waivers are in effect for fluoride
- State does not require confirmation samples for fluoride
- Fluoride MCL is 3.0 mg/l
- PWS takes sample for fluoride analysis at source #1 during 1994 ... Analytical result is 4.2 mg/l which exceeds the MCL ... thus, a single sample MCL violation has been incurred
- PWS takes sample for fluoride analysis at source #2 during 1994 ... Analytical result is 3.7 mg/l which exceeds the MCL ... thus, a second single sample MCL violation has been incurred

Since two single sample MCL violations have been incurred for this system (source #1 and source #2), it would seem that the source #1 single sample MCL violation, the source #2 single sample MCL violation, or both violations would be reported to FRDS. However, in reality, neither violation would be reported to FRDS for two distinct reasons, as follows:

DRAFT FINAL

1. The NPDWR for fluoride applies only to CWSs, and this PWS is a NTNCWS;

- and -

2. The NPDWR MCL for fluoride is 4.0 mg/l, but in this State, the fluoride MCL is 3.0 mg/l.

In other words, both of the single sample MCL violations incurred are solely State violations. Violations which are solely State violations **MUST** NOT be reported to FRDS.

Federal violations are defined on page 1 - 5, and State violations are defined on page 1 - 6.

**b. Multiple M&R Violations**

In this scenario, a PWS incurs two regular sampling M&R violations at different sampling points for the same contaminant and for the same monitoring period.

- PWS is a TNCWS
- PWS has three sources, all groundwater
- Monitoring for nitrate is required at all of the sources annually
- Nitrate MCL is 10 mg/l
- PWS takes sample for nitrate analysis at source #1 during 1995 ... Analytical result is 4.2 mg/l which is below the MCL
- PWS does not sample for nitrate at source #2 during 1995 ... thus, a regular sampling M&R violation has been incurred
- PWS does not sample for nitrate at source #3 during 1995 ... thus, a second regular sampling M&R violation has been incurred

Since two regular sampling M&R violations have been incurred for this system (source #2 and source #3), the source #2 regular sampling M&R violation, the source #3 regular sampling M&R

violation, or both violations must be reported to FRDS.

Whether or not each of the regular sampling M&R violations is reported to FRDS is dependant upon the method of violation reporting being utilized for this PWS, sampling point specific or system specific.

If the State is utilizing sampling point specific reporting for this PWS, both of the regular sampling M&R violations incurred must be reported to FRDS.

If the State is utilizing system specific reporting for this PWS, either the regular sampling M&R violation incurred for source #2, or the regular sampling M&R violation incurred for source #3 must be reported to FRDS, but not both.

Sampling point specific violation reporting is discussed on page 1 - 10, and system specific violation reporting is discussed on page 1 - 11.

c. MCL and M&R Violation Combinations

i. Scenario #1 - One MCL and One M&R

In this scenario, a PWS incurs one single sample MCL violation and one regular sampling M&R violation at different sampling points for the same contaminant and for the same monitoring period.

- PWS is a CWS
- PWS is serving 2,500 persons
- PWS has two sources
- Monitoring for lindane has been reduced to 1 sample per compliance period (every three years) since there were no detects for either of the two sources in the initial round of sampling performed in 1995
- No waivers are in effect for lindane
- State does not require confirmation samples for lindane

DRAFT FINAL

- Lindane MCL is 0.0002 mg/l
- Lindane detection level is 0.00002 mg/l
- PWS takes sample for lindane analysis at source #1 during December, 1998 ... Analytical result is 0.0003 mg/l which exceeds the MCL ... thus, a single sample MCL violation has been incurred
- PWS does not take sample for lindane analysis at source #2 during the 1996-1998 compliance period ... thus, a regular sampling M&R violation has been incurred

Since two separate types of violations have been incurred for this PWS (one single sample MCL [source #1] and one regular sampling M&R [source #2]), both the single sample MCL violation and the regular sampling M&R violation must be reported to FRDS, regardless of whether sampling point or system specific reporting is being used for this PWS.

ii. Scenario #2 - Two MCL and One M&R

In this scenario, a PWS incurs two single sample MCL violations and one regular sampling M&R violation at different sampling points for the same contaminant and for the same monitoring period.

- PWS is a NTNCWS
- PWS has three sources, one surface water and two groundwater
- Since surface water is used, PWS is a surface water system
- Monitoring for styrene has been reduced to 1 sample per year since there were no detects for any of the three sources in the initial round of sampling performed in 1995
- No waivers are in effect for styrene
- State does not require confirmation samples for styrene
- Styrene MCL is 0.01 mg/l
- Styrene detection level is 0.0005 mg/l

DRAFT FINAL

- PWS takes sample for styrene analysis at source #1 during December, 1996 ... Analytical result is 0.02 mg/l which exceeds the MCL ... thus, a single sample MCL violation has been incurred
- PWS does not take sample for styrene analysis at source #2 during 1996 ... thus, a regular sampling M&R violation has been incurred
- PWS takes sample for styrene analysis at source #3 during December, 1996 ... Analytical result is 0.04 mg/l which exceeds the MCL ... thus, a second single sample MCL violation has been incurred

Since two separate types of violations have been incurred for this PWS (two single sample MCL [source #1 and source #3] and one regular sampling M&R [source #2]), both violation types must be reported to FRDS (i.e., at least one of the two single sample MCL violations must be reported and the regular sampling M&R violation must be reported).

Whether or not each of the single sample MCL violations is reported to FRDS is dependant upon the method of violation reporting being utilized for this PWS, sampling point specific or system specific.

If the State is utilizing sampling point specific reporting for the PWS, the single sample MCL violation incurred for source #1 and the single sample MCL violation incurred for source #3 must be reported to FRDS.

If the State is utilizing system specific reporting for the PWS, only one of the two single sample MCL violations must be reported. In choosing which of the two to report, always report the more severe violation. Thus, the single sample MCL incurred for source #3 should be reported to FRDS since it is more severe than the single sample MCL violation incurred for source #1.

Sampling point specific violation reporting is discussed on page 1 - 10, and system specific violation reporting is discussed on page 1 - 11.

iii. Scenario #3 - One MCL and Two M&R

In this scenario, a PWS incurs one average MCL violation, one regular sampling M&R violation, and one confirmation sampling M&R violation at different sampling points for the same contaminant and for the same monitoring period. The average MCL violation is incurred at the same sampling point as the confirmation sampling M&R violation, but is for the same contaminant and for the same monitoring period.

- PWS is a CWS
- PWS has three sources, two surface water and one groundwater
- Since surface water is used, PWS is a surface water system
- PWS is conducting its initial round of monitoring for ethylbenzene in 1993 (1 sample each quarter at each of its three sources)
- No waivers are in effect ethylbenzene
- State requires confirmation samples for ethylbenzene results exceeding the MCL
- Ethylbenzene MCL is 0.7 mg/l
- Ethylbenzene detection level is 0.0005 mg/l
- PWS takes samples for ethylbenzene analysis at source #1 during each of the four quarters in 1993 ... Analytical results are:
  - Qtr 1: 0.3 mg/l
  - Qtr 2: 0.1 mg/l
  - Qtr 3: 0.4 mg/l
  - Qtr 4: 2.5 mg/l
- PWS does not take the State required confirmation sample at source #1 in response to the 4th Qtr. result exceeding the MCL ... thus, a confirmation sampling M&R violation has been incurred
- Running annual average of the 4 quarterly sample results for source #1 is:  
 $(0.3 + 0.1 + 0.4 + 2.5) = 3.3$   
 $3.3 \div 4 = 0.825$  (0.8 after rounding) ...  
thus, an average MCL violation has been incurred

DRAFT FINAL

- PWS takes samples for ethylbenzene analysis at source #2 during each of the four quarters in 1993 ... Analytical results are:
  - Qtr 1: 0.4 mg/l
  - Qtr 2: 0.3 mg/l
  - Qtr 3: 0.4 mg/l
  - Qtr 4: 0.3 mg/l
- All samples were taken as required for source #2 ... thus, NO M&R violation exists
- Running annual average of the 4 quarterly sample results for source #2 is:  
 $(0.4 + 0.3 + 0.4 + 0.3) = 1.4$   
 $1.4 \div 4 = 0.35$  (0.4 after rounding) ... thus, NO MCL violation exists
- PWS takes samples for ethylbenzene analysis at source #3 during each of the first three quarters in 1993, but fails to take the required 4th quarter sample ... thus, a regular sampling M&R violation has been incurred. Analytical results for the first three quarters are:
  - Qtr 1: 0.3 mg/l
  - Qtr 2: 0.2 mg/l
  - Qtr 3: 0.4 mg/l
- Running annual average of the 3 quarterly sample results for source #3 is:  
 $(0.3 + 0.2 + 0.4) = 0.9$   
 $0.9 \div 3 = 0.3$  ... thus, NO MCL violation exists

Three separate types of violations have been incurred for this system (one confirmation sampling M&R [source #1], one average MCL [source #1], and one regular sampling M&R [source #3]).

From the three total violations which were incurred by this system, the average MCL violation incurred by source #1 and the regular sampling M&R violation incurred by source #3 must be reported to FRDS. The confirmation sampling M&R violation incurred by source #1 is solely a State violation since the NPDWRs do not require confirmation samples for ethylbenzene. Violations which are solely State violations MUST NOT be reported to FRDS.

Federal violations are defined on page 1 - 5, and State violations are defined on page 1 - 6.



9





**Part 2: Reporting to FRDS****A. Data that must be Reported for ALL Violations****1. Data Elements and Descriptions**

The following data must be supplied by the State for EVERY Federal M&R, MCL, and Treatment Technique violation reported to FRDS:

FRDS Data Element		Description
No.	Name	
C101	PWS-ID	The public water system identification number
C1101	VIO-ID	An identification number for the violation
C1103	VIO-CONTAMINANT	An identification number for the contaminant for which the violation was incurred
C1105	VIO-TYPE	The type of violation incurred
C1107	VIO-COMP-PERIOD-BEGIN-DATE	The beginning date of the monitoring period
C1111	VIO-COMP-PERIOD-MONTHS	The duration of the monitoring period in months
C1143	VIO-SE-ID	The Source/Entity ID at which the violation was incurred

**2. Violation Types**

Under the Phase II rule, five (5) types of Federal violations may be incurred. Of these five types of violations, two (2) types are M&R violations, two (2) types

are MCL violations, and one (1) type is a Treatment Technique violation. They are as follows:

1. Single sample MCL violation (violation type 01) - Refer to the definition on page 1 - 2.
2. Average MCL violation (violation type 02) - Refer to the definition on page 1 - 3.
3. Regular sampling M&R violation (violation type 03) - Refer to the definition on page 1 - 5.
- 4. Confirmation sampling M&R violation (violation type 04) - Refer to the definition on page 1 - 5.
- and -
5. Treatment Technique violation (violation type 07) - Refer to the definition on page 1 - 5.

**3. Monitoring Period Begin Date and Months**

The monitoring period reported to FRDS does NOT define the period of time a PWS is in violation. Rather, it reflects the period of time during which monitoring was to have been performed.

Monitoring frequencies (e.g., quarterly, annual, every 3 years) differ dependant upon a variety of facts. The contaminant in question, whether or not a PWS is monitoring during the first compliance period of a compliance cycle, whether or not the system has "triggered" increased monitoring or has qualified for decreased monitoring based upon its analytical history, and whether or not a waiver is in effect all contribute to establishment of the current monitoring frequency.

It is the monitoring frequency in effect at any point in time that determines the monitoring period begin date and months reported to FRDS for all Federal M&R, MCL, and Treatment Technique violations.

Since the Standardized Monitoring Framework is calendar year based and States are required to report ONLY violations of the Federal rule, the monitoring period begin date and months reported should coincide with the calendar quarters and calendar years as follows:

Monitoring Frequency	Monitoring Begin Date to report	Monitoring period Months to report
Confirmation sampling for nitrate & nitrite	01/01/yy . . . 12/01/yy	01 . . . 01
Quarterly	01/01/yy 04/01/yy 07/01/yy 10/01/yy	03 03 03 03
Annually	01/01/yy	12
Every 3 years	01/01/yy	36
Every 6 years	01/01/yy	72
Every 9 years	01/01/yy	108

If a violation incurred does not possess any of the monitoring frequencies listed above, it CANNOT be a Federal violation and must NOT be reported to FRDS.

A Federal violation is defined on page 1 - 5 and a State violation is defined on page 1 - 6.

#### 4. Source/Entity ID and Designating Sampling Point versus System Specific Reporting

The source/entity ID must be reported to FRDS so that EPA can distinguish a sampling point from a system specific violation.

If the source/entity ID reported to FRDS for a violation is greater than zero, the violation will be assumed to be a sampling point specific violation.

If the source/entity ID reported to FRDS for a violation is equal to zero, the violation will be assumed to be a system specific violation.

### 5. Format of Violations Reported

All Federal M&R, MCL, and Treatment Technique violations must be reported to FRDS in the FRDS-II Data Transfer Format (DTF).

### B. Additional Data that must be Reported for M&R Violations

#### 1. Data Elements and Descriptions

The following data must be supplied by the State for EVERY Federal M&R violation reported to FRDS. This data is in addition to the data that must be reported for ALL violations described on page 2 - 1:

FRDS Data Element		Description
No.	Name	
C1131	VIO-MAJOR-VIOLATION-FLAG	A code designating whether the violation is a <u>major</u> or <u>minor</u> M&R violation

#### 2. Major versus Minor

All M&R violations reported to FRDS must be classified as either a major or minor violation. This classification is not applicable to MCL or Treatment Technique violations.

A major M&R violation is defined on page 1 - 4, and a minor M&R violation is defined on page 1 - 4.

When reporting by sampling point and one or more major M&R violations have been incurred for the same contaminant, the State must report a separate major M&R violation to FRDS for each sampling point at which a major M&R violation was incurred.

When reporting by system and one or more major M&R violations have been incurred for the same contaminant, the State must report a single major M&R violation to FRDS.

See section 3 below on page 2 - 6 for the data element values which must be reported and the data element values which may be reported for a major M&R violation. See

section 4 below, beginning on page 2 - 7, for an illustration of a hypothetical major confirmation sampling M&R violation, a completed FRDS-II data capture form, and an image of the DTF transactions which correspond to the completed data capture form for the violation.

When reporting by sampling point and one or more minor M&R violations have been incurred for the same contaminant, the State must report a separate minor M&R violation to FRDS for each sampling point at which a minor M&R violation was incurred. Please note that it is not possible for a PWS to incur a minor confirmation sampling M&R violation when the State is reporting by sampling point for the PWS<sup>15</sup>.

When reporting by system and one or more minor M&R violations have been incurred for the same contaminant, the State must report a single minor M&R violation to FRDS.

See section 5 below on page 2 - 9 for the data element values which must be reported and the data element values which may be reported for a minor M&R violation. See section 6 below, beginning on page 2 - 10, for an illustration of a hypothetical minor regular sampling M&R violation, a completed FRDS-II data capture form, and an image of the DTF transactions which correspond to the completed data capture form for the violation.

---

<sup>15</sup> This is because the NPDWRs only require a single confirmation sample for nitrate and nitrite. Thus, it is impossible to take some, but not all, of the confirmation samples required. The PWS either takes the single confirmation sample or not.

## 3. Major M&amp;R Violation Reporting

The primacy agency must report the following data:

----- Data Element -----			Comment /
No.	Name	Description	Value
C101	PWS-ID	The PWS ID number	
C1101	VIO-ID	An ID for the violation	
C1103	VIO-CONTAMINANT	The contaminant ID for the violation	See Appendix A or Appendix B
C1105	VIO-TYPE	The violation type	03-regular sampling 04-confirmation sampling
C1107	VIO-COMP-PERIOD-BEGIN-DATE	The date the monitoring period began	mmddyy
C1111	VIO-COMP-PERIOD-MONTHS	The duration of the monitoring period in months	01, 03, 12, 36, 72, or 108
C1131	VIO-MAJOR-VIOLATION-FLAG	Major violation design.	Y (i.e., Yes)
C1143	VIO-SR-ID	The source/entity ID	> 0 if reporting by sampling point - 0 if reporting by system

The primacy agency may optionally report the following data:

----- Data Element -----			Comment /
No.	Name	Description	Value
Instead of reporting C1111, VIO-COMP-PERIOD-MONTHS, report:			
C1109	VIO-COMP-PERIOD-END-DATE	The date the monitoring period ended	mmddyy
Instead of reporting C1131, VIO-MAJOR-VIOLATION-FLAG, report:			
C1129	VIO-SAMPLES-TAKEN	The number of samples actually taken	0 (zero)

4. Major Confirmation Sampling M&R Violation Example

Scenario:

- PWS is AZ1298347
- PWS has two sources of water, both groundwater
- PWS is required to monitor for nitrate (contaminant ID 1040) during the 2nd calendar quarter of 1993 (04/01 - 06/30) for each source
- Nitrate MCL is 10 mg/l
- State is reporting violations for this PWS on a sampling point specific basis
- PWS takes nitrate sample for source #1 (source/entity ID 001) on 5/15/93. Analytical result was 5.3 mg/l ... thus, NO MCL violation was incurred
- PWS takes nitrate sample for source #2 (source/entity ID 002) on 06/15/93. Analytical result was 10.7 mg/l. Since this result exceeds the MCL, the PWS is required to collect a confirmation sample, but fails to do so ... thus, both a single sample MCL violation (violation type 01) and a confirmation sampling M&R violation (violation type 04) have been incurred
- The confirmation sampling violation is classified as a major M&R violation by definition
- Since the monitoring frequency assumed for confirmation sampling is 1 month, and the required confirmation sample was to have been collected within 24 hours of the 06/15/93 initial sample analysis, the monitoring period begin date is 06/01/93

Figure 2 illustrates a completed FRDS-II data capture form wherein all required data element values for this hypothetical nitrate major confirmation sampling M&R violation have been coded. Data element values that may be optionally reported are intentionally omitted from the illustration. The single sample MCL violation is not shown.

Figure 3 illustrates the FRDS-II DTF transactions which correspond to the Figure 2 data capture form.

Refer to the FRDS-II Data Entry Instructions for additional details.



U.S. ENVIRONMENTAL  
PROTECTION AGENCY

# Public Water System Data Capture Form D

PWS ID

ACTION CODE

BATCH DATE

State ID Number  
A 2 1 2 9 8 3 4 7  
(C101)

I  
I = Insert M = Modify

MO DAY YR  
1 1 5 9 3

<div style="border: 1px solid black; padding: 2px; display: inline-block;">D1</div>										<h2 style="text-align: center;">VIOLATION DATA</h2>																																			
<b>VIOLATION ID</b> FY ID NUMBER 9 4 6 0 0 0 1 (C1101)				<b>CONTAMINANT</b> 1 0 4 0 (C1102)				<b>VIOLATION TYPE</b> 0 4 (C1103)		<b>COMPLIANCE PERIOD BEGIN</b> MO DAY YR 0 6 1 1 9 3 (C1107)				<b>COMPLIANCE PERIOD END</b> MO DAY YR (C1108)				OR		<b>COMPLIANCE PERIOD DURATION</b> 0 0 1 (C1111)																									
<b>SE ID</b> 0 0 2 (C1113)				<b>AWARENESS DATE</b> MO DAY YR (C1115)				<table border="1" style="width: 100%;"> <tr> <th colspan="12">MONITORING AND REPORTING VIOLATIONS</th> </tr> <tr> <td colspan="6"> <b>NUM SAMPLES REQUIRED</b>          (C1127)       </td> <td colspan="6"> <b>NUM SAMPLES TAKEN</b>          (C1129)       </td> <td colspan="6"> <b>MAJOR VIOLATION</b>          Y          (C1131)       </td> </tr> </table>								MONITORING AND REPORTING VIOLATIONS												<b>NUM SAMPLES REQUIRED</b> (C1127)						<b>NUM SAMPLES TAKEN</b> (C1129)						<b>MAJOR VIOLATION</b> Y (C1131)					
MONITORING AND REPORTING VIOLATIONS																																													
<b>NUM SAMPLES REQUIRED</b> (C1127)						<b>NUM SAMPLES TAKEN</b> (C1129)						<b>MAJOR VIOLATION</b> Y (C1131)																																	
OR																																													
<h3 style="text-align: center;">MAXIMUM CONTAMINANT LEVEL VIOLATIONS</h3>																																													
<b>ANALYSIS METHOD</b> (C1121)				<b>ANALYSIS RESULT</b> (C1123)												<b>MCL VIOLATED</b> (C1125)																													

Figure 2: Major Confirmation Sampling M&R Violation - FRDS-II  
Data Capture Form

...	05	...	10	...	15	...	20	...	25	...	30	...	35	...	40	...	45	...	50	...	55	...	60	...	65	...	70	...	75	...	80
D1AZ12983479400001																															
D1AZ12983479400001																															
D1AZ12983479400001																															
D1AZ12983479400001																															
D1AZ12983479400001																															

Figure 3: Major Confirmation Sampling M&R Violation - FRDS-II  
DTF Transactions



## 5. Minor M&amp;R Violation Reporting

The primacy agency must report the following data:

----- Data Element -----			Comment /
No.	Name	Description	Value
C1101	PWS-ID	The PWS ID number	
C1101	VIO-ID	An ID for the violation	
C1103	VIO-CONTAMINANT	The contaminant ID for the violation	See Appendix A
C1105	VIO-TYPE	The violation type	03-regular sampling 04-confirmation sampling
C1107	VIO-COMP-PERIOD-BEGIN-DATE	The date the monitoring period began	mmddyy
C1111	VIO-COMP-PERIOD-MONTHS	The duration of the monitoring period in months	01, 03, 12, 36, 72, or 108
C1131	VIO-MAJOR-VIOLATION-FLAG	Major violation design.	N (i.e., No)
C1143	VIO-SR-ID	The source/entity ID	> 0 if reporting by <u>sampling</u> <u>point</u> - 0 if reporting by <u>SYSTEM</u>

The primacy agency may optionally report the following data:

----- Data Element -----			Comment /
No.	Name	Description	Value
Instead of reporting C1111, VIO-COMP-PERIOD-MONTHS, report:			
C1109	VIO-COMP-PERIOD-END-DATE	The date the monitoring period ended	mmddyy
Instead of reporting C1131, VIO-MAJOR-VIOLATION-FLAG, report:			
C1129	VIO-SAMPLES-TAKEN	The number of samples actually taken	> 0 (zero)

6. Minor Regular Sampling M&R Violation Example

Scenario:

- PWS is FL9812763
- PWS is a CWS
- PWS has three sources of water, two groundwater and one surface water
- Since surface water is utilized, PWS is a surface water system
- PWS is required to monitor for styrene (contaminant ID 2996) annually beginning in 1996 (01/01 - 12/31) for each source
- State is reporting violations for this PWS on a system specific basis
- PWS takes styrene sample for source #1 (source/entity ID 001) on 2/20/96. Analytical result was below the MCL
- PWS fails to take styrene samples for source #2 (source/entity ID 002) and source #3 (source/entity ID 003) during 1996 ... thus two regular sampling M&R violations (violation type 03) have been incurred
- Since the State is reporting violations for this PWS on a system specific basis, only one of the two violations must be reported. The single regular sampling violation to be reported is classified as a minor M&R violation by definition
- Since the current monitoring frequency for styrene is annual, the monitoring period has a length of 12 months with a begin date of 01/01/96

Figure 4 illustrates a completed FRDS-II data capture form wherein all required data element values for this hypothetical styrene minor regular sampling M&R violation have been coded. Data element values that may be optionally reported are intentionally omitted from the illustration.

Figure 5 illustrates the FRDS-II DTF transactions which correspond to the Figure 4 data capture form.

Refer to the FRDS-II Data Entry Instructions for additional details.



U.S. ENVIRONMENTAL  
PROTECTION AGENCY

# Public Water System Data Capture Form D

PWS ID

ACTION CODE

BATCH DATE

State ID Number  
FL 9812763  
(C101)

I  
I = Insert M = Modify

MO DAY YR  
011597

D1

## VIOLATION DATA

VIOLATION ID  
FY ID NUMBER  
9700035  
(C1101)

CONTAMINANT  
2996  
(C1103)

VIOLATION  
TYPE  
03  
(C1105)

COMPLIANCE PERIOD BEGIN  
MO DAY YR  
010196  
(C1107)

COMPLIANCE PERIOD END  
MO DAY YR  
(C1109)

OR

COMPLIANCE PERIOD  
DURATION  
012  
(C1111)

SE ID  
000  
(C1143)

AWARENESS DATE  
MO DAY YR  
(C1115)

## MONITORING AND REPORTING VIOLATIONS

NUM SAMPLES  
REQUIRED  
(C1127)

NUM SAMPLES  
TAKEN  
(C1129)

OR

MAJOR  
VIOLATION  
N Y = YES  
N = NO  
(C1131)

OR

## MAXIMUM CONTAMINANT LEVEL VIOLATIONS

ANALYSIS METHOD	ANALYSIS RESULT	MCL VIOLATED
(C1121)	(C1123)	(C1125)

Figure 4: Minor Regular Sampling M&R Violation - FRDS-II Data  
Capture Form

...	05	...	10	...	15	...	20	...	25	...	30	...	35	...	40	...	45	...	50	...	55	...	60	...	65	...	70	...	75	...	80	
D1FL98127639700035																																
D1FL98127639700035																																
D1FL98127639700035																																
D1FL98127639700035																																
D1FL98127639700035																																
D1FL98127639700035																																
D1FL98127639700035																																
D1FL98127639700035																																

Figure 5: Minor Regular Sampling M&R Violation - FRDS-II DTF  
Transactions

## C. Additional Data that must be Reported for MCL Violations

## 1. Data Elements and Descriptions

The following data must be supplied by the State for EVERY Federal MCL violation reported to FRDS. This data is in addition to the data that must be reported for ALL violations described on page 2 - 1:

FRDS Data Element		Description
No.	Name	
C1115	VIO-AWARE-DATE	The date on which the State became aware of the existence of the MCL violation
C1123	VIO-ANALYSIS-RESULT	<p>For a <u>single sample</u> MCL violation, the regular sample result causing the violation.</p> <p><u>Nitrate and nitrite</u> For an <u>average</u> MCL violation, the average result of the initial and confirmation samples causing the violation.</p> <p><u>Other than nitrate and nitrite</u> For an <u>average</u> MCL violation, the running annual causing the violation. average</p>

See section 2 below on page 2 - 13 for the data element values which must be reported and the data element values which may be reported for a MCL violation. See section 3 below, beginning on page 2 - 14, for an illustration of a hypothetical average MCL violation, a completed FRDS-II data capture form, and an image of the DTF transactions which correspond to the completed data capture form for the violation.

## 2. MCL Violation Reporting

The primacy agency must report the following data:

----- Data Element -----			Comment /
No.	Name	Description	Value
C1101	PWS-ID	The PWS ID number	
C1101	VIO-ID	An ID for the violation	
C1103	VIO-CONTAMINANT	The contaminant ID for the violation	See Appendix A
C1105	VIO-TYPE	The violation type	01-Single Sample MCL 02-Average MCL
C1107	VIO-COMP-PERIOD-BEGIN-DATE	The date the monitoring period began	mmddyy
C1111	VIO-COMP-PERIOD-MONTHS	The duration of the monitoring period in months	03, 12, 36, 72, or 108
C1115	VIO-AWARE-DATE	The date State became aware of the MCL violation	mmddyy
C1123	VIO-ANALYSIS-RESULT	The single sample or average result causing the violation	
C1143	VIO-SOURCE-ID	The source/entity ID	> 0 if reporting by sampling point - 0 if reporting by stream

The primacy agency may optionally report the following data:

----- Data Element -----			Comment /
No.	Name	Description	Value
C1125	VIO-MCL-VIOLATED	The MCL which was violated	
Instead of reporting C1111, VIO-COMP-PERIOD-MONTHS, report:			
C1109	VIO-COMP-PERIOD-END-DATE	The date the monitoring period ended	mmddyy

3. Average MCL Violation Reporting Example

## Scenario:

- PWS is MO5467328
- PWS is a CWS serving 2,500 persons
- PWS has two sources of water, both groundwater
- PWS is required to monitor for 2,4,5-TP (contaminant ID 2110) quarterly during 1994 for each source
- MCL for 2,4,5-TP is 0.05 mg/l
- It is August 8, 1994 and the 3rd quarter results for this PWS have recently arrived ... MCL compliance determination will be conducted for this PWS today
- State is reporting violations for this PWS on a sampling point specific basis
- PWS takes 2,4,5-TP samples for source #1 (source/entity ID 001) on 2/20/94 (Qtr 1), 04/12/94 (Qtr 2), and 07/17/94 (Qtr 3). Analytical results were as follows:
  - Qtr 1: 0.03 mg/l
  - Qtr 2: 0.04 mg/l
  - Qtr 3: 0.20 mg/l
- The running annual average is:
  - $(0.03 + 0.04 + 0.20) = 0.27$
  - $0.27 \div 3 = 0.09$  which exceeds the MCL ... thus, an average MCL violation has been incurred (violation type 02)
- PWS takes 2,4,5-TP samples for source #2 (source/entity ID 002) during each of the 3 quarters of 1994 ... all results are below the MCL
- Since the State is reporting violations for this PWS on a sampling point specific basis, each violation incurred must be reported to FRDS
- Since the current monitoring frequency for 2,4,5-TP is quarterly, the monitoring period has a length of 3 months with a begin date of 07/01/94

Figure 6 illustrates a completed FRDS-II data capture form wherein all required data element values for this hypothetical 2,4,5-TP average MCL violation have been coded. Data element values that may be optionally reported are intentionally omitted from the illustration.

Figure 7 illustrates the FRDS-II DTF transactions which correspond to the Figure 6 data capture form.

Refer to the FRDS-II Data Entry Instructions for additional details.



**PWS ID**

**ACTION CODE**

BATCH DATE

State ID Number  
M 0 5 4 6 7 3 2 8  
(C101)

**I** I = Insert M = Modify

NO DAY YR  
0 0 9 4

<b>D1 VIOLATION DATA</b>																								
<b>VIOLATION ID</b> FY      ID NUMBER <div style="border: 1px solid black; padding: 2px; display: flex; justify-content: space-between;"> <span>9   5   6   0   0   7   5</span> </div> <small>(C1101)</small>					<b>CONTAMINANT</b> <div style="border: 1px solid black; padding: 2px; display: flex; justify-content: space-between;"> <span>2   1   1   0</span> </div> <small>(C1100)</small>				<b>VIOLATION TYPE</b> <div style="border: 1px solid black; padding: 2px; display: flex; justify-content: space-between;"> <span>0   2</span> </div> <small>(C1108)</small>		<b>COMPLIANCE PERIOD BEGIN</b> MO   DAY   YR <div style="border: 1px solid black; padding: 2px; display: flex; justify-content: space-between;"> <span>0   7   0   1   9   4</span> </div> <small>(C1107)</small>			<b>COMPLIANCE PERIOD END</b> MO   DAY   YR <div style="border: 1px solid black; padding: 2px; display: flex; justify-content: space-between;"> <span>                     </span> </div> <small>(C1109)</small>			OR					<b>COMPLIANCE PERIOD DURATION</b> <div style="border: 1px solid black; padding: 2px; display: flex; justify-content: space-between;"> <span>0   0   3</span> </div> <small>(C1111)</small>		
<b>SE ID</b> <div style="border: 1px solid black; padding: 2px; display: flex; justify-content: space-between;"> <span>0   0   1</span> </div> <small>(C1143)</small>					<b>AWARENESS DATE</b> MO   DAY   YR <div style="border: 1px solid black; padding: 2px; display: flex; justify-content: space-between;"> <span>0   8   0   8   9   4</span> </div> <small>(C1115)</small>																			
MONITORING AND REPORTING VIOLATIONS																								
<b>NUM SAMPLES REQUIRED</b> <div style="border: 1px solid black; padding: 2px; display: flex; justify-content: space-between;"> <span>         </span> </div> <small>(C1127)</small>					<b>NUM SAMPLES TAKEN</b> <div style="border: 1px solid black; padding: 2px; display: flex; justify-content: space-between;"> <span>         </span> </div> <small>(C1129)</small>					OR					<b>MAJOR VIOLATION</b> <div style="border: 1px solid black; padding: 2px; display: flex; justify-content: space-between;"> <span> </span> </div> <small>(C1131)</small> <div style="margin-top: 5px;">             Y = YES              N = NO           </div>									
OR																								
MAXIMUM CONTAMINANT LEVEL VIOLATIONS																								
<b>ANALYSIS METHOD</b> <div style="border: 1px solid black; padding: 2px; display: flex; justify-content: space-between;"> <span>         </span> </div> <small>(C1121)</small>					<b>ANALYSIS RESULT</b> <div style="border: 1px solid black; padding: 2px; display: flex; justify-content: space-between;"> <span>                    0   .   0   9                        </span> </div> <small>(C1122)</small>					<b>MCL VIOLATED</b> <div style="border: 1px solid black; padding: 2px; display: flex; justify-content: space-between;"> <span>                        .                                </span> </div> <small>(C1125)</small>														

```

...05...10...15...20...25...30...35...40...45...50...55...60...65...70...75...80
. . . . .
DIM054673289540075      IC11032110      101094
DIM054673289540075      IC110502      101094
DIM054673289540075      IC1107070194      101094
DIM054673289540075      IC1111003      101094
DIM054673289540075      IC1115080894      101094
DIM054673289540075      IC11230.09      101094
DIM054673289540075      IC1143001      101094

```

Figure 7: Average MCL Violation - FRDS-II DTF Transactions

D. Additional Data that must be Reported for Treatment Technique Violations

1. Data Elements and Descriptions

No additional data must be supplied by the State for EVERY Treatment Technique violation reported to FRDS. The data that must be reported is that which must be reported for ALL violations described on page 2 - 1.

See section 2 below on page 2 - 17 for the data element values which must be reported and the data element values which may be reported for a Treatment Technique violation. See section 3 below, beginning on page 2 - 18, for an illustration of a hypothetical epichlorohydrin Treatment Technique violation, a completed FRDS-II data capture form, and an image of the DTF transactions which correspond to the completed data capture form for the violation.



## 2. Treatment Technique Violation Reporting

The primacy agency must report the following data:

----- Data Element -----			Comment /
No.	Name	Description	Value
C101	PWS-ID	The PWS ID number	
C1101	VIO-ID	An ID for the violation	
C1103	VIO-CONTAMINANT	The contaminant ID for the violation	2257 for Epichlorohydrin 2265 for Acrylamide
C1105	VIO-TYPE	The violation type	07
C1107	VIO-COMP-PERIOD-BEGIN-DATE	The date the monitoring period began	0101yy
C1111	VIO-COMP-PERIOD-MONTHS	The duration of the monitoring period in months	12
C1113	VIO-SOURCE-ID	The source/entity ID	> 0 if reporting by sampling point - 0 if reporting by system

The primacy agency may optionally report the following data:

----- Data Element -----			Comment /
No.	Name	Description	Value
Instead of reporting C1111, VIO-COMP-PERIOD-MONTHS, report:			
C1109	VIO-COMP-PERIOD-END-DATE	The date the compliance period ended	mmddyy

3. Treatment Technique Violation Reporting Example

Scenario:

- PWS is AK9871235
- PWS has four sources of water, three groundwater and one surface water
- Source #4 (Source/Entity ID 004) is the surface source
- Epichlorohydrin (contaminant ID 2257) is used in treating source #4. It is not used in treating sources #1 - #3
- State is reporting violations for this PWS on a sampling point specific basis
- PWS fails to certify that the epichlorohydrin is being used according to the manufacturer's directions for 1993 ... thus, a Treatment Technique violation has been incurred
- Since the State is reporting violations for this PWS on a sampling point specific basis, each violation incurred must be reported to FRDS
- Since certification is to be provided annually, the monitoring period has a length of 12 months with a begin date of 01/01/93

Figure 8 illustrates a completed FRDS-II data capture form wherein all required data element values for this hypothetical epichlorohydrin Treatment Technique violation have been coded. Data element values that may be optionally reported are intentionally omitted from the illustration.

Figure 9 illustrates the FRDS-II DTF transactions which correspond to the Figure 8 data capture form.

Refer to the FRDS-II Data Entry Instructions for additional details.



U.S. ENVIRONMENTAL  
PROTECTION AGENCY

# Public Water System Data Capture Form D

PWS ID

ACTION CODE

BATCH DATE

State ID Number  
A K 1 9 8 7 1 2 3 5  
(C101)

I  
I = Insert M = Modify

MO DAY YR  
0 1 2 0 9 4

VIOLATION DATA													
D1		VIOLATION ID		CONTAMINANT		VIOLATION TYPE		COMPLIANCE PERIOD BEGIN		COMPLIANCE PERIOD END		COMPLIANCE PERIOD DURATION	
FY ID NUMBER								MO DAY YR		MO DAY YR		OR	
1 5 4 0 0 0 1		2 2 5 7		0 7		0 1 0 1 9 3						0 1 2	
(C1101)		(C1103)		(C1105)		(C1107)		(C1109)		(C1111)			
SE ID		AWARENESS DATE		MONITORING AND REPORTING VIOLATIONS									
0 0 4		MO DAY YR		NUM SAMPLES REQUIRED		NUM SAMPLES TAKEN		MAJOR VIOLATION		Y = YES N = NO			
(C1143)		(C1115)		(C1127)		(C1129)		OR		(C1131)			
OR													
MAXIMUM CONTAMINANT LEVEL VIOLATIONS													
ANALYSIS METHOD		ANALYSIS RESULT						MCL VIOLATED					
(C1121)		(C1122)						(C1125)					

Figure 8: Treatment Technique Violation - FRDS-II Data Capture Form

...05...10...15...20...25...30...35...40...45...50...55...60...65...70...75...80		
D1AK98712959540001	IC11032257	012094
D1AK98712959540001	IC110507	012094
D1AK98712959540001	IC1107010193	012094
D1AK98712959540001	IC1111012	012094
D1AK98712959540001	IC1143004	012094

Figure 9: Treatment Technique Violation - FRDS-II DTF Transactions



**Appendix A: Phase II Contaminants**

**Contaminant ID Codes by Contaminant Name**



### A. Inorganic Contaminants (IOCs)

### B. Phase II Unregulated Inorganic Contaminants

1074	Antimony	X
1075	Beryllium	X
1024	Cyanide	X
1036	Nickel	X
1055	Sulfate	X
1085	Thallium	X

## Appendix A: Phase II Contaminants

## Contaminant ID Codes by Contaminant Name

Contaminant ID	Contaminant Name	Phase I VOC	Phase II Treatment: Unregulated Chemical	Phase IIB VOC	Phase V VOC
2051	Alachlor				
2047	Aldicarb				
2044	Aldicarb sulfone				
2043	Aldicarb sulfoxide				
2050	Atrazine				
2046	Carbofuran				
2959	Chlordane				
2931	Dibromochloropropane (DBCP)				
2105	2,4-D				
2946	Ethylene dibromide (EDB)				
2065	Heptachlor				
2067	Heptachlor epoxide				
2010	Lindane				
2015	Methoxychlor				
2326	Pentachlorophenol				
2383	Polychlorinated biphenyls (PCBs)				
2020	Toxaphene				
2110	2,4,5-TP (Silvex)				

## C. Synthetic Organic Contaminants (SOCs)

2051	Alachlor	X			
2047	Aldicarb				
2044	Aldicarb sulfone				
2043	Aldicarb sulfoxide				
2050	Atrazine				
2046	Carbofuran				
2959	Chlordane				
2931	Dibromochloropropane (DBCP)				
2105	2,4-D				
2946	Ethylene dibromide (EDB)				
2065	Heptachlor				
2067	Heptachlor epoxide				
2010	Lindane				
2015	Methoxychlor				
2326	Pentachlorophenol				
2383	Polychlorinated biphenyls (PCBs)				
2020	Toxaphene				
2110	2,4,5-TP (Silvex)				



## Appendix A: Phase II Contaminants

## Contaminant ID Codes by Contaminant Name

Contaminant Name	Phase I VOC	Phase II VOC	Phase II SOC	Phase II Chemical	Phase II Unregulated	Phase II IOE	Phase II VOC	Phase II SOC	Phase II VOC	Phase II SOC
2990 Benzene	X									
2982 Carbon tetrachloride	X									
2968 o-Dichlorobenzene			X							
2969 p-Dichlorobenzene	X									
2980 1,2-Dichloroethane	X									
2977 1,1-Dichloroethylene	X									
2380 cis-1,2-Dichloroethylene			X							
2979 trans-1,2-Dichloroethylene			X							
2983 1,2-Dichloropropane			X							
2992 Ethylbenzene			X							
2989 Monochlorobenzene			X							
2996 Styrene			X							
2987 Tetrachloroethylene			X							
2991 Toluene			X							
2981 1,1,1-Trichloroethane	X									
2984 Trichloroethylene (TCE)	X									
2976 Vinyl chloride	X									
2955 Xylene (total)			X							

Appendix A: Phase II Contaminants

Contaminant ID Codes by Contaminant Name

Contaminant Name	Phase I VOC	Phase II Treatment Unregulated Chemical	Phase III VOC	Phase IV VOC	Phase V VOC
2265 Acrylamide					
2257 Epichlorohydrin					

E. Water Treatment Chemicals

X  
X

F. Phase II Unregulated Organic Contaminants

2356 Aldrin	X
2306 Benzo(a)pyrene	X
2076 Butachlor	X
2021 Carbaryl	X
2031 Dapton	X
2035 Di(2-ethylhexyl)adipate	X
2039 Di(2-ethylhexyl)phthalates	X
2440 Dicamba	X
2070 Dieldrin	X
2041 Dinoseb	X
2032 Diquat	X
2033 Endothall	X
2034 Glyphosate	X
2274 Hexachlorobenzene	X

Appendix A: Phase II Contaminants

Contaminant ID Codes by Contaminant Name

Contaminant ID	Contaminant Name	Original UPR	Phase I VOC	Phase II Treatment Unregulated Chemical	Phase IIB VOC	Phase V VOC
2042	Hexachlorocyclopentadiene					
2066	3-Hydroxycarbofuran					
2022	Methomyl					
2045	Metolachlor					
2595	Metribuzin					
2036	Oxamyl (Vydate)					
2040	Picloram					
2077	Propachlor					
2037	Simazine					
2063	2,3,7,8-TCDD (Dioxin)					



**Appendix B: Group Contaminant Code Utilization**



Appendix B: Group Contaminant Code Utilization

Table B-1

Compliance Cycle 1										
Compliance Period 1			Compliance Period 2			Compliance Period 3				
1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001

Inorganic Contaminant GCCs

1***										
------	--	--	--	--	--	--	--	--	--	--

Volatile Organic Contaminant GCCs

2V07										
2V08										
2V10										
2V17										
2V18										

Synthetic Organic Contaminant GCCs

2***										
2S13										
2S18										

Unregulated Contaminant GCCs

2U15										
2U34										
2U36										
1U06										
2U24										

Note: The period of time during which a GCC can be reported to FRDS is shaded





# Appendix B Group Contaminant Code Utilization (Continued)

DRAFT FINAL

## Rules for Use

1. When a Group Contaminant Code (GCC) is input to FRDS, multiple violations will be inserted into the Data Base (i.e., one violation for each contaminant belonging to the group).
2. GCCs may only be used for regular sampling Monitoring & Reporting (M&R) violations (i.e., violation type 03).
3. GCCs may NOT be used for confirmation sampling M&R violations (i.e., violation type 04).
4. GCCs may only be used for major M&R violations (i.e., where no samples have been taken).
5. GCCs may NOT be used for minor M&R violations (i.e., where some (but not all) samples have been taken).
6. GCCs may only be used when ALL contaminants belonging to the group are being monitored at the same frequency.
7. GCCs may NOT be used when ANY contaminants from among the group have had their monitoring increased, reduced, or eliminated.
8. GCCs may NOT be used when violations for a PWS are being reported on a system specific basis, UNLESS NO samples (for any contaminant) were taken at ANY sampling point.
9. GCCs may NOT be used when violations for a PWS are being reported on a sampling point specific basis, UNLESS NO samples (for any contaminant) were taken at the SUBJECT sampling point.

## Inorganic Contaminant GCCs

1***	1005 - Arsenic	1010 - Barium	1015 - Cadmium	1020 - Chromium
	1025 - Fluoride	1030 - Lead	1035 - Mercury	1040 - Nitrate (as N)
	1045 - Selenium	1050 - Silver		

## Volatile Organic Contaminants GCCs

2V07	2969 - p-Dichlorobenzene	2977 - 1,1-Dichloroethylene	2980 - 1,2-Dichloroethane	2981 - 1,1,1-Trichloroethane
	2982 - Carbon tetrachloride	2984 - Trichloroethylene	2990 - Benzene	
2V08	2969 - p-Dichlorobenzene	2976 - Vinyl chloride	2977 - 1,1-Dichloroethylene	2980 - 1,2-Dichloroethane
	2981 - 1,1,1-Trichloroethane	2982 - Carbon tetrachloride	2984 - Trichloroethylene	2990 - Benzene
2V10	2380 - cis-1,2-Dichloroethylene	2955 - Xylene (total)	2968 - o-Dichlorobenzene	2979 - trans-1,2-Dichloroethylene
	2983 - 1,2-Dichloropropane	2987 - Tetrachloroethylene	2989 - Monochlorobenzene	2991 - Toluene
	2992 - Ethylbenzene	2996 - Styrene		
2V17	2380 - cis-1,2-Dichloroethylene	2955 - Xylene (total)	2968 - o-Dichlorobenzene	2969 - p-Dichlorobenzene
	2977 - 1,1-Dichloroethylene	2979 - trans-1,2-Dichloroethylene	2980 - 1,2-Dichloroethane	2981 - 1,1,1-Trichloroethane
	2982 - Carbon tetrachloride	2983 - 1,2-Dichloropropane	2984 - Trichloroethylene	2987 - Tetrachloroethylene
	2989 - Monochlorobenzene	2990 - Benzene	2991 - Toluene	2992 - Ethylbenzene
	2996 - Styrene			
2V18	2380 - cis-1,2-Dichloroethylene	2955 - Xylene (total)	2968 - o-Dichlorobenzene	2969 - p-Dichlorobenzene
	2976 - Vinyl chloride	2977 - 1,1-Dichloroethylene	2979 - trans-1,2-Dichloroethylene	2980 - 1,2-Dichloroethane
	2981 - 1,1,1-Trichloroethane	2982 - Carbon tetrachloride	2983 - 1,2-Dichloropropane	2984 - Trichloroethylene
	2987 - Tetrachloroethylene	2989 - Monochlorobenzene	2990 - Benzene	2991 - Toluene
	2992 - Ethylbenzene	2996 - Styrene		

Appendix B  
Group Contaminant Code Utilization (Continued)

## Synthetic Organic Contaminant GCCs

2***	2005 - Endrin 2105 - 2,4-D	2010 - Lindane 2110 - 2,4,5-TP (Silvex)	2015 - Methoxychlor	2020 - Toxaphene
2513	2043 - Aldicarb sulfoxide 2050 - Atrazine 2326 - Pentachlorophenol 2946 - Ethylene Dibromide (EDB)	2044 - Aldicarb sulfone 2051 - Alachlor 2383 - Polychlorinated Biphenyls (PCBs) 2959 - Chlordane	2046 - Carbofuran 2065 - Heptachlor	2047 - Aldicarb 2067 - Heptachlor epoxide 2931 - Dibromochloropropane (DBCP)
2518	2010 - Lindane 2044 - Aldicarb sulfone 2051 - Alachlor 2110 - 2,4,5-TP (Silvex) 2931 - Dibromochloropropane (DBCP)	2015 - Methoxychlor 2046 - Carbofuran 2065 - Heptachlor 2326 - Pentachlorophenol	2020 - Toxaphene 2047 - Aldicarb 2067 - Heptachlor epoxide 2383 - Polychlorinated Biphenyls (PCBs) 2946 - Ethylene Dibromide (EDB)	2043 - Aldicarb sulfoxide 2050 - Atrazine 2105 - 2,4-D 2959 - Chlordane

## Unregulated Contaminant GCCs

2015	2030 - p-Isopropyltoluene 2248 - Naphthalene 2422 - n-Butylbenzene 2430 - Bromochloromethane	2212 - Dichlorodifluoromethane 2378 - 1,2,4-Trichlorobenzene 2424 - 1,3,5-Trimethylbenzene 2994 - Isopropylbenzene	2218 - Trichlorofluoromethane 2418 - 1,2,4-Trimethylbenzene 2426 - tert-Butylbenzene 2998 - n-Propylbenzene	2246 - Hexachlorobutadiene 2420 - 1,2,3-Trichlorobenzene 2428 - sec-Butylbenzene
2034	2210 - Chloromethane 2408 - Dibromomethane 2414 - 1,2,3-Trichloropropane 2943 - Bromodichloromethane 2965 - o-Chlorotoluene 2978 - 1,1-Dichloroethane 2986 - 1,1,1,2-Tetrachloroethane 2991 - Toluene 2996 - Styrene	2214 - Bromomethane 2410 - 1,1-Dichloropropane 2416 - 2,2-Dichloropropane 2944 - Dibromochloromethane 2966 - p-Chlorotoluene 2979 - trans-1,2-Dichloroethylene 2987 - Tetrachloroethylene 2992 - Ethylbenzene 2997 - o-Xylene	2216 - Chloroethane 2412 - 1,3-Dichloropropane 2941 - Chloroform 2962 - p-Xylene 2967 - m-Dichlorobenzene 2983 - 1,2-Dichloropropane 2988 - 1,1,2,2-Tetrachloroethane 2993 - Bromobenzene	2380 - cis-1,2-Dichloroethylene 2413 - 1,3-Dichloropropane 2942 - Bromoform 2964 - Dichloromethane 2968 - o-Dichlorobenzene 2985 - 1,1,2-Trichloroethane 2989 - Monochlorobenzene 2995 - m-Xylene
2036	2210 - Chloromethane 2408 - Dibromomethane 2414 - 1,2,3-Trichloropropane 2941 - Chloroform 2946 - Ethylene Dibromide (EDB) 2966 - p-Chlorotoluene 2979 - trans-1,2-Dichloroethylene 2987 - Tetrachloroethylene 2992 - Ethylbenzene 2997 - o-Xylene	2214 - Bromomethane 2410 - 1,1-Dichloropropane 2416 - 2,2-Dichloropropane 2942 - Bromoform 2962 - p-Xylene 2967 - m-Dichlorobenzene 2983 - 1,2-Dichloropropane 2988 - 1,1,2,2-Tetrachloroethane 2993 - Bromobenzene	2216 - Chloroethane 2412 - 1,3-Dichloropropane 2931 - Dibromochloropropane (DBCP) 2943 - Bromodichloromethane 2964 - Dichloromethane 2968 - o-Dichlorobenzene 2985 - 1,1,2-Trichloroethane 2989 - Monochlorobenzene 2995 - m-Xylene	2380 - cis-1,2-Dichloroethylene 2413 - 1,3-Dichloropropane 2944 - Dibromochloromethane 2965 - o-Chlorotoluene 2978 - 1,1-Dichloroethane 2986 - 1,1,2-Tetrachloroethane 2991 - Toluene 2996 - Styrene
1006	1024 - Cyanide 1075 - Beryllium	1036 - Nickel 1085 - Thallium	1055 - Sulfate	1074 - Antimony
2024	2021 - Carbaryl 2033 - Endothall 2037 - Simazine 2042 - Hexachlorocyclopentadiene 2070 - Dieldrin 306 - Benzo(a)pyrene	2022 - Methomyl 2034 - Glyphosate 2039 - Di(2-ethylhexyl)phthalates 2045 - Metolachlor 2076 - Butachlor 2356 - Aldrin	2031 - Dalapon 2035 - Di(2-ethylhexyl)adipate 2040 - Picloram 2063 - 2,3,7,8-TCDD (dioxin) 2077 - Propachlor 2440 - Picamba	2032 - Diquat 2036 - Oxamyl (Vydate) 2041 - Dinoseb 2066 - 3-Hydroxycarbofuran 2274 - Hexachlorobenzene (HCB) 2595 - Metribuzin

**Appendix C: Phase II Compliance Determination Flowcharts**



12

13



Appendix C  
Phase II Compliance Determination Flowcharts

Table of Contents

Introduction . . . . .	C - 1
MCL Compliance Determination	
Nitrate & Nitrite . . . . .	C - 2
IOC (other than Nitrate & Nitrite), SOC, and VOC . . . . .	C - 3
M&R Compliance Determination	
IOCs	
Asbestos - Groundwater & Surface Water systems . . . . .	C - 4
Fluoride - Groundwater systems . . . . .	C - 5
Fluoride - Surface Water systems . . . . .	C - 6
Nitrate - Groundwater systems . . . . .	C - 7
Nitrate - Surface Water systems . . . . .	C - 8
Nitrite - Groundwater & Surface Water systems . . . . .	C - 9
IOC (other than Asbestos, Fluoride, Nitrate, Nitrite) - Groundwater systems . . . . .	C - 10
IOC (other than Asbestos, Fluoride, Nitrate, Nitrite) - Surface Water systems . . . . .	C - 11
SOCs	
Serving > 3,300 Persons - Groundwater & Surface Water systems . . . . .	C - 12
Serving ≤ 3,300 Persons - Groundwater & Surface Water systems . . . . .	C - 13
VOCs	
Groundwater systems . . . . .	C - 14
Surface Water systems . . . . .	C - 15
Unregulated Contaminants	
Inorganic Contaminants - Groundwater & Surface Water systems . . . . .	C - 16
Organic Contaminants - Groundwater & Surface Water systems . . . . .	C - 17
Treatment Technique Compliance Determination . . . . .	C - 18



1

2



Appendix C  
Phase II Compliance Determination Flowcharts

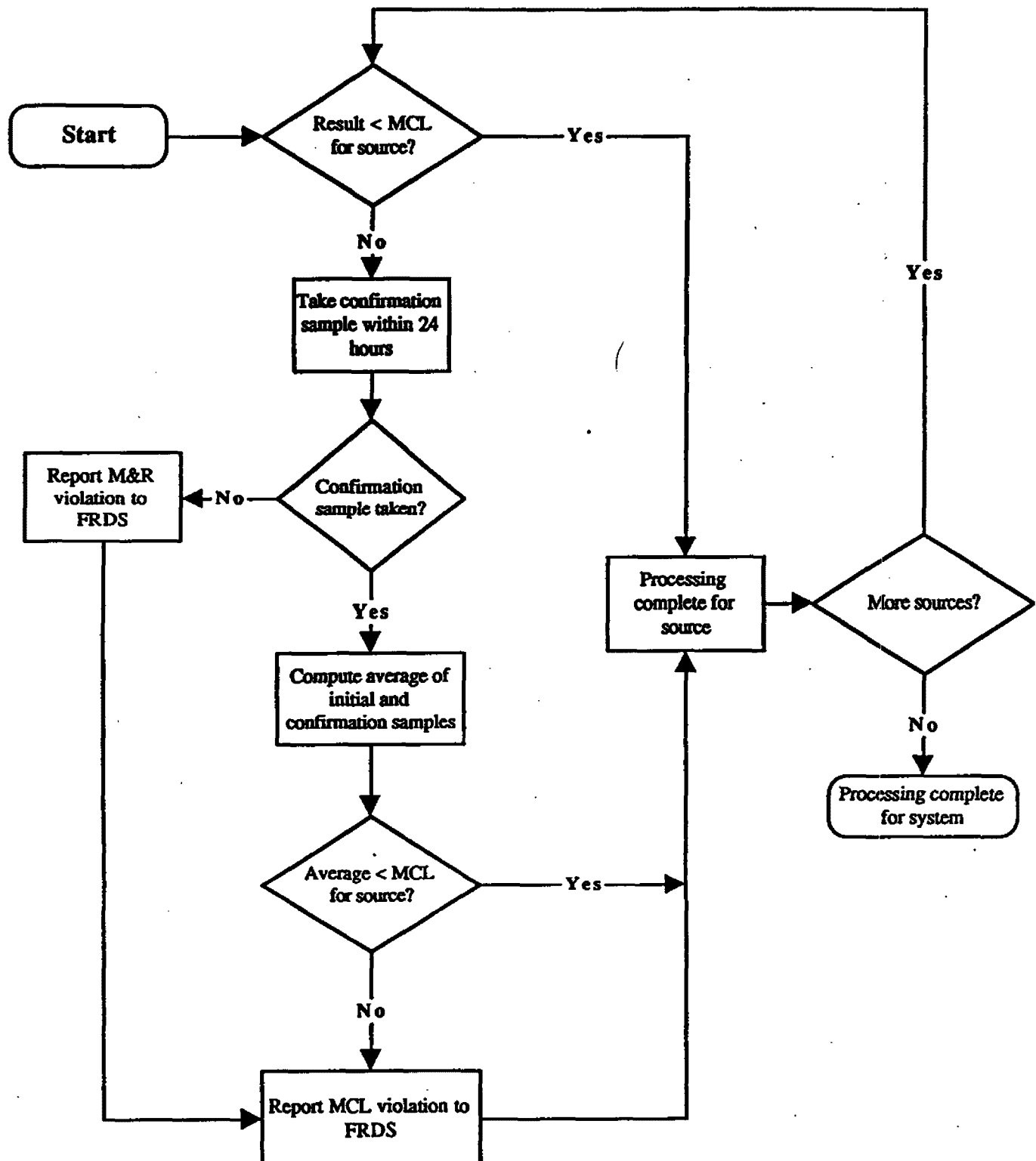
Introduction

The flowcharts in this Appendix were developed to provide an overview of the compliance determination process and to show the points at which violations, reportable to FRDS, are incurred.

Several notes are in order with respect to these flowcharts. They are:

- Only the major procedural steps in MCL, M&R, and Treatment Technique violation determination are shown
- - The flowcharts depict reporting to FRDS by sampling point. This was not meant to imply that reporting to FRDS by sampling point is the only acceptable method. Although reporting to FRDS by sampling point is the method preferred by EPA, reporting to FRDS by system is acceptable.
- Sample compositing procedures were intentionally omitted
- Public notification procedures were intentionally omitted

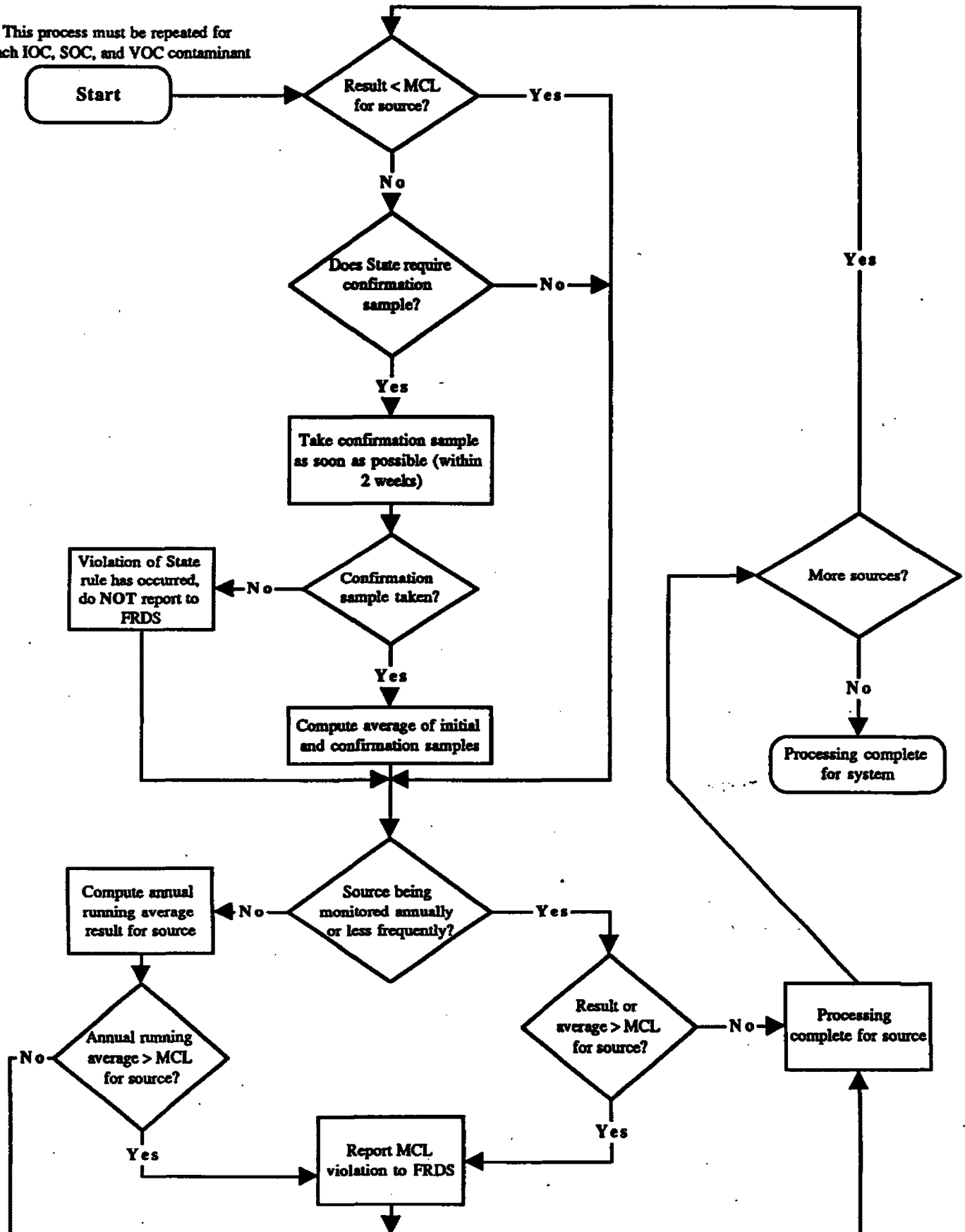
## Nitrate and Nitrite MCL Compliance Determination



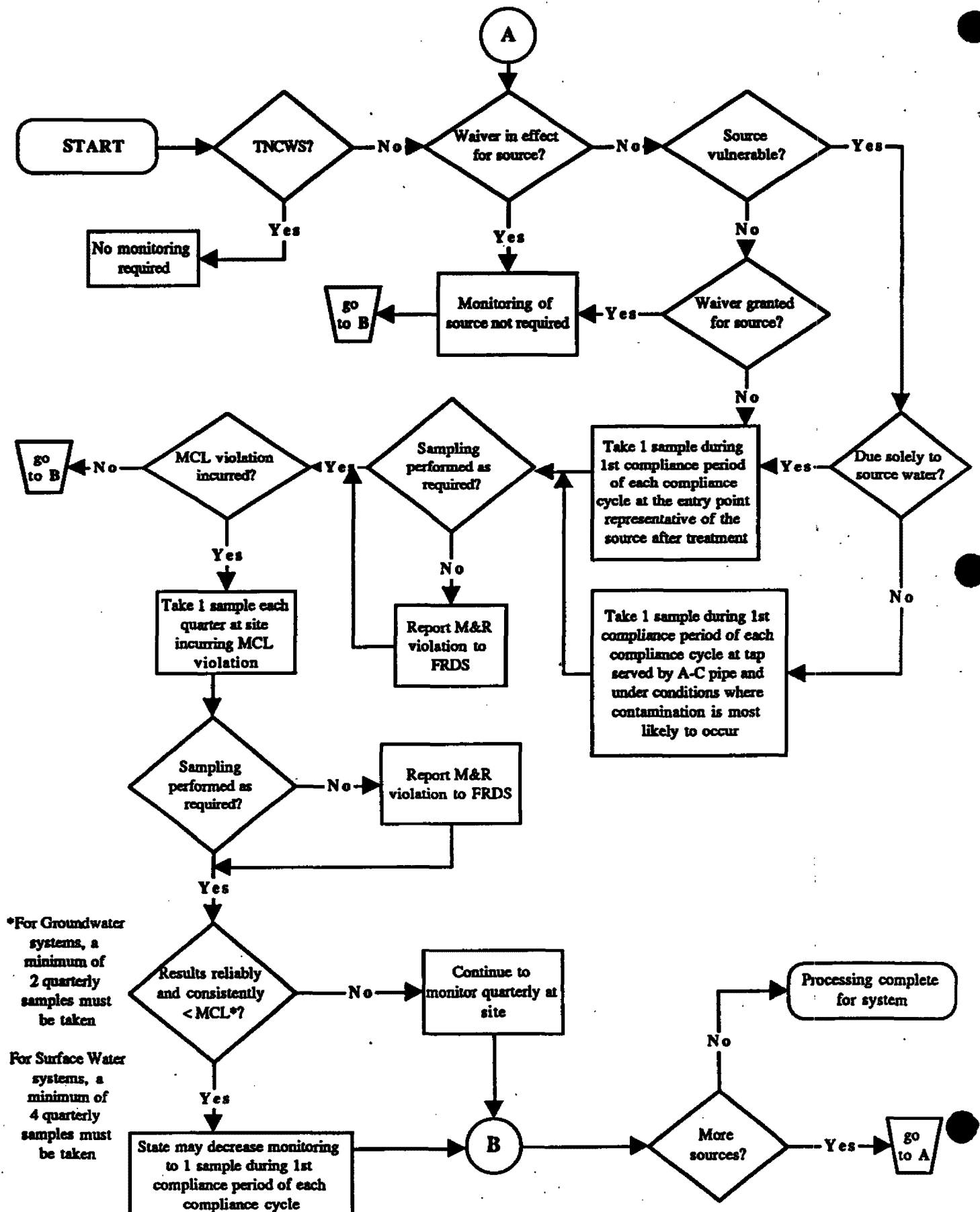


## IOC (other than Nitrate and Nitrite), SOC, and VOC MCL Compliance Determination

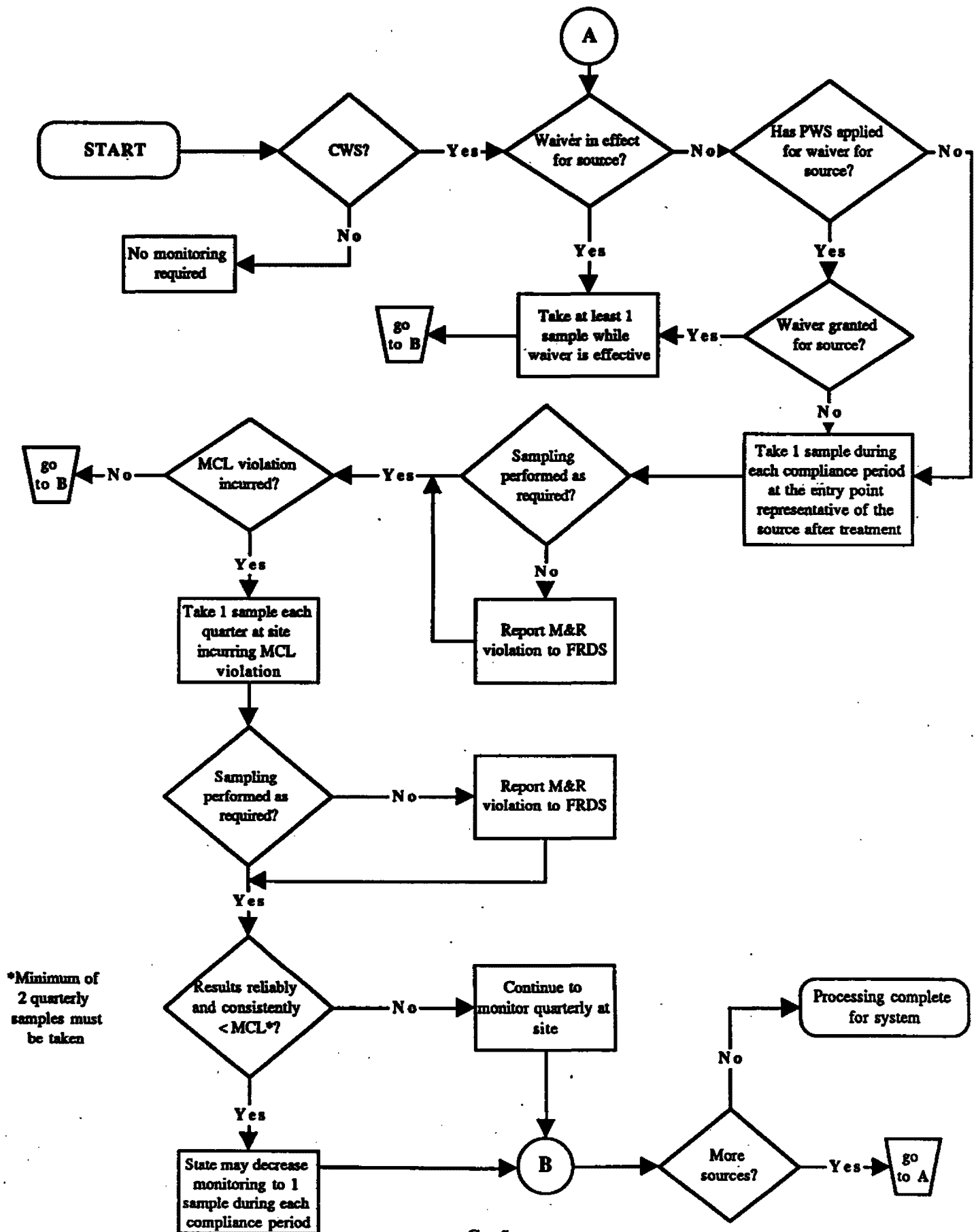
This process must be repeated for each IOC, SOC, and VOC contaminant



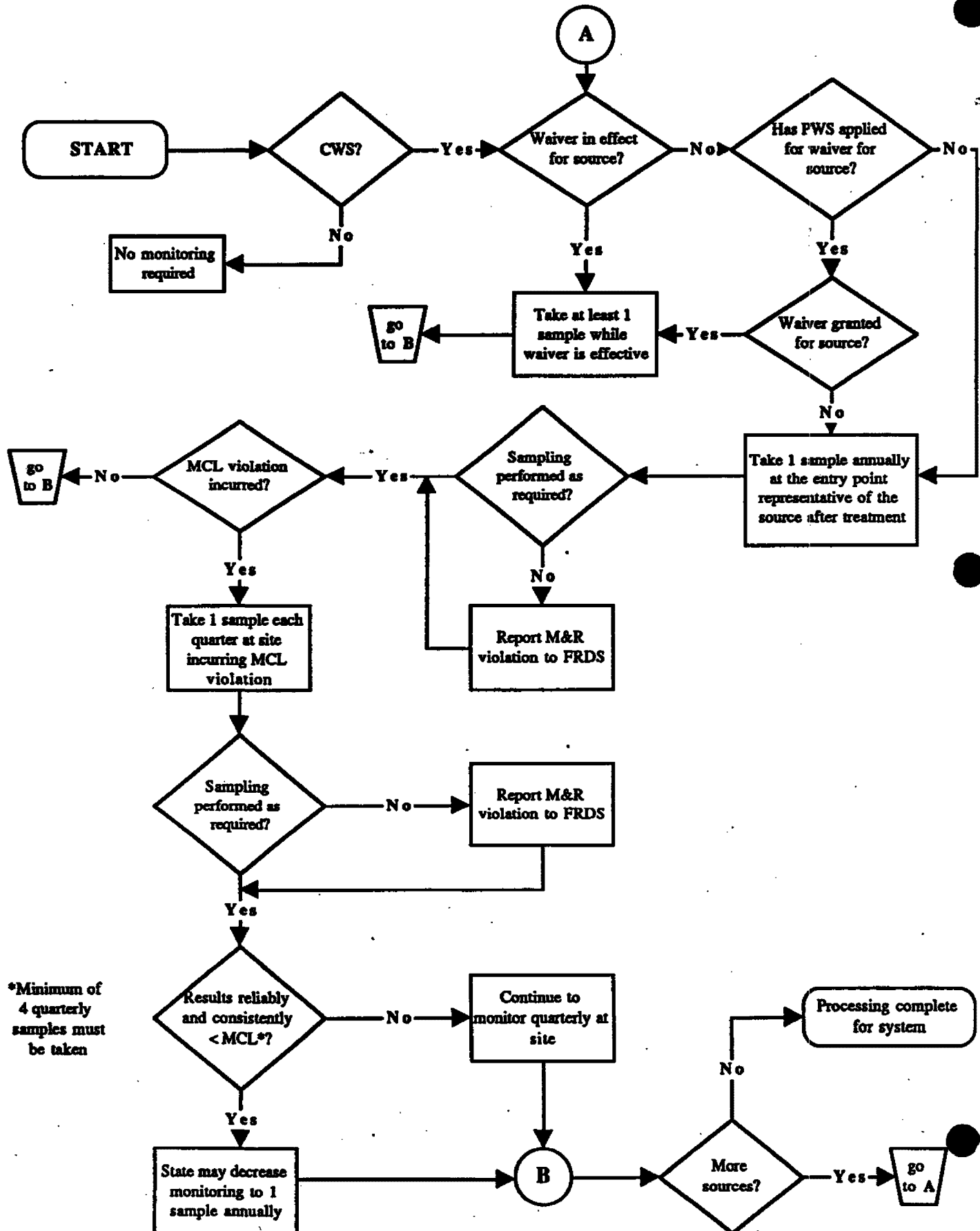
## Asbestos M &amp; R Compliance Determination (Groundwater and Surface Water Systems)



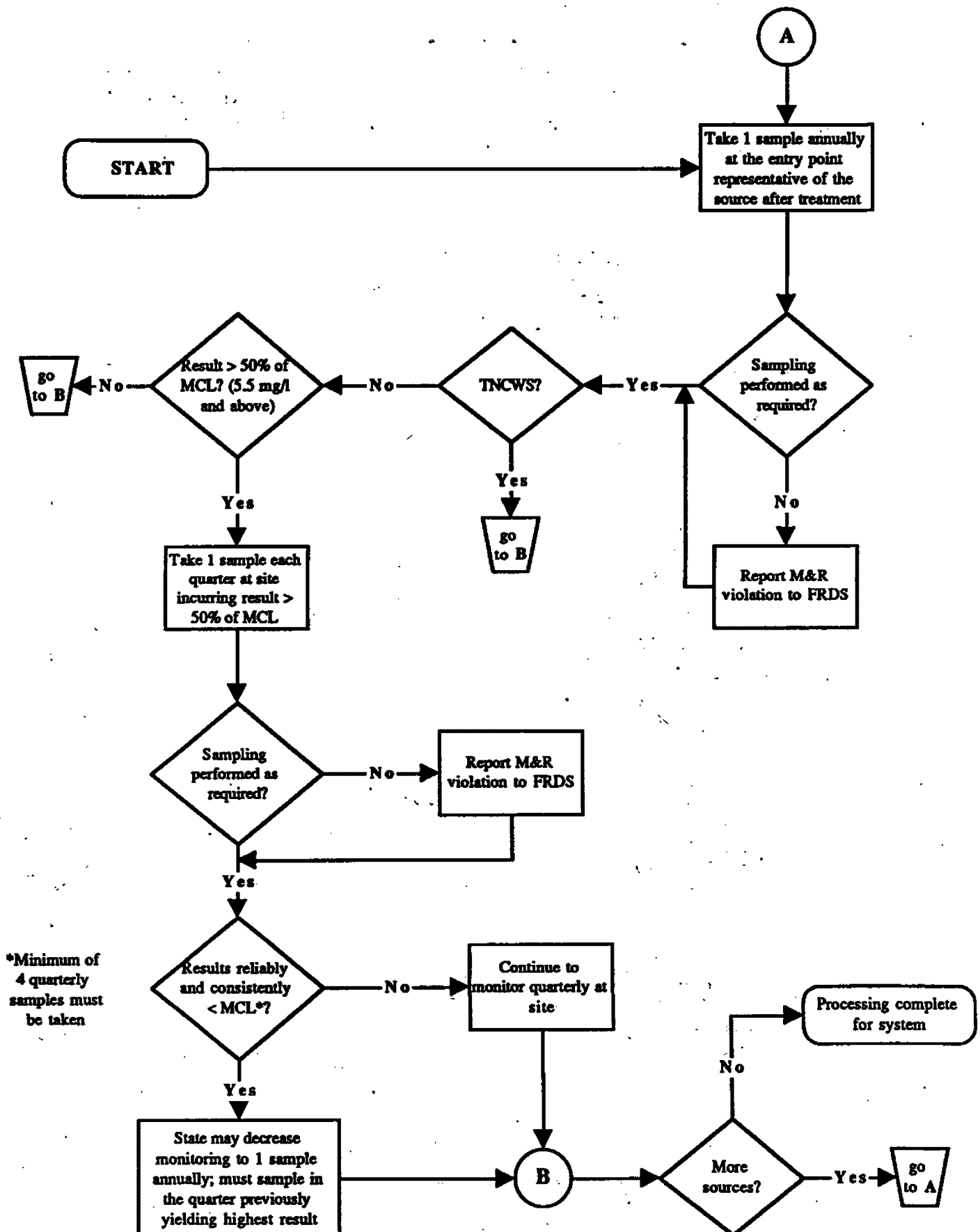
## Fluoride M &amp; R Compliance Determination (Groundwater Systems)



## Fluoride M &amp; R Compliance Determination (Surface Water Systems)

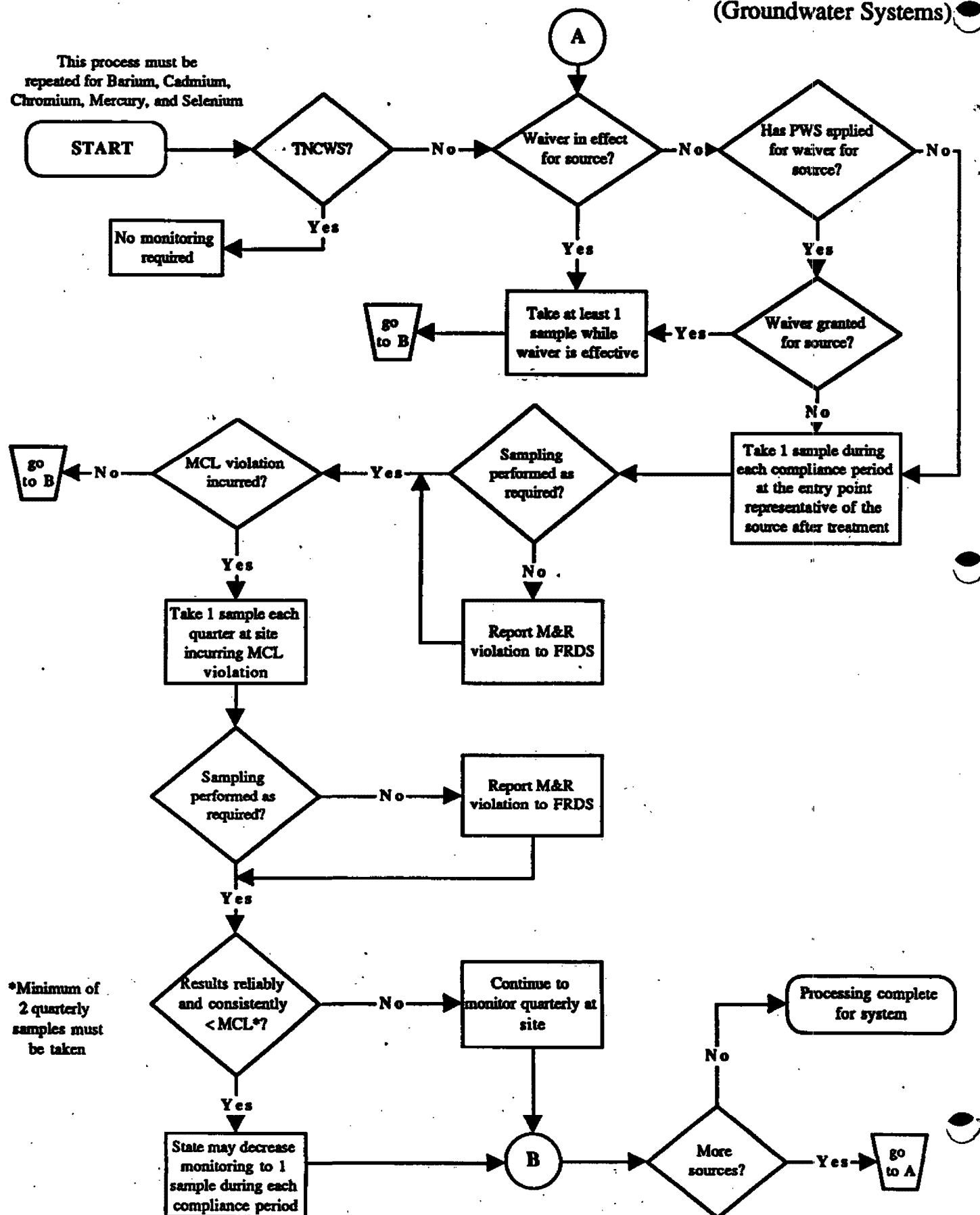


## Nitrate M&amp;R Compliance Determination (Groundwater Systems)



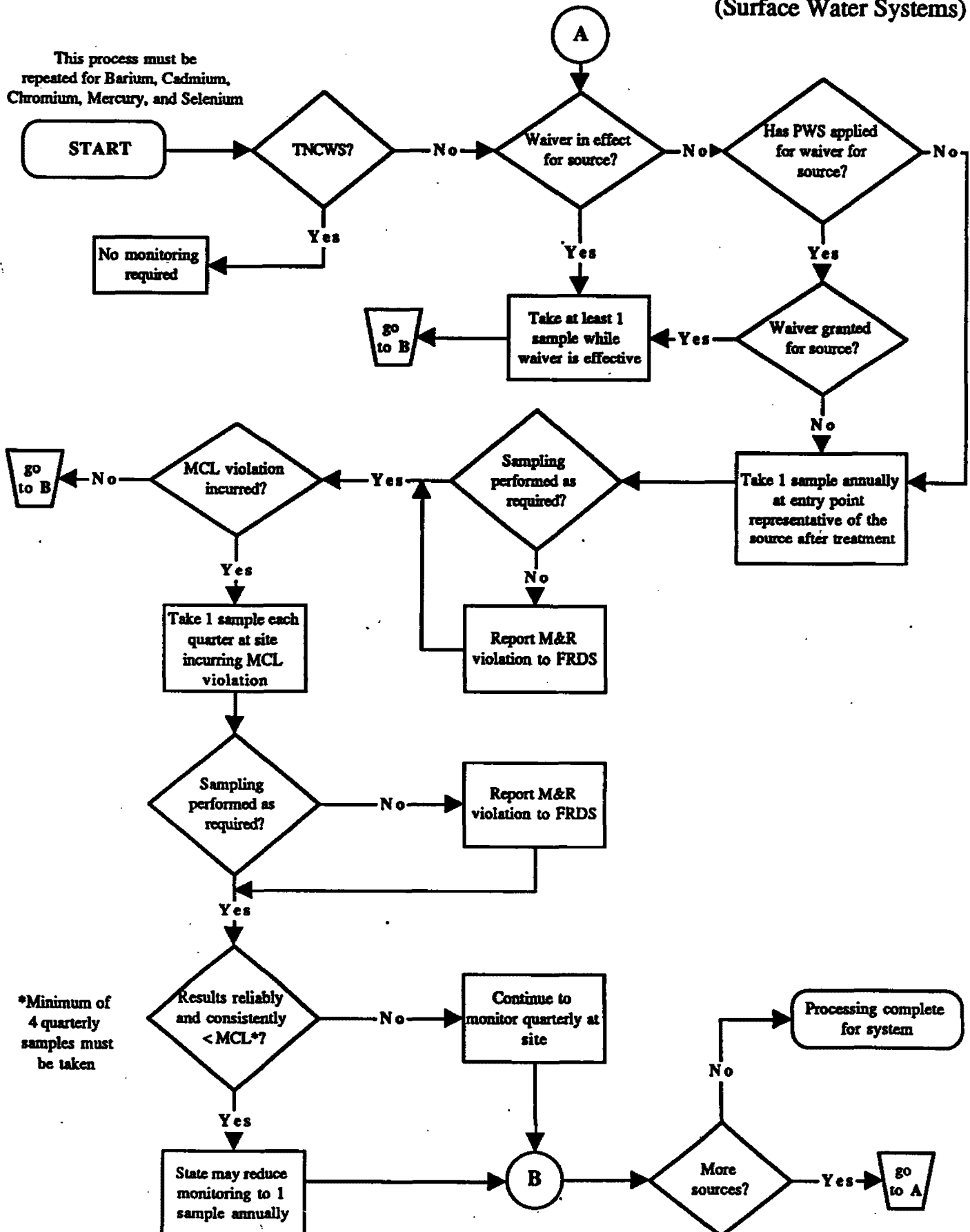
# IOC (other than Asbestos, Fluoride, Nitrate, Nitrite) M & R Compliance Determination (Groundwater Systems)

This process must be repeated for Barium, Cadmium, Chromium, Mercury, and Selenium



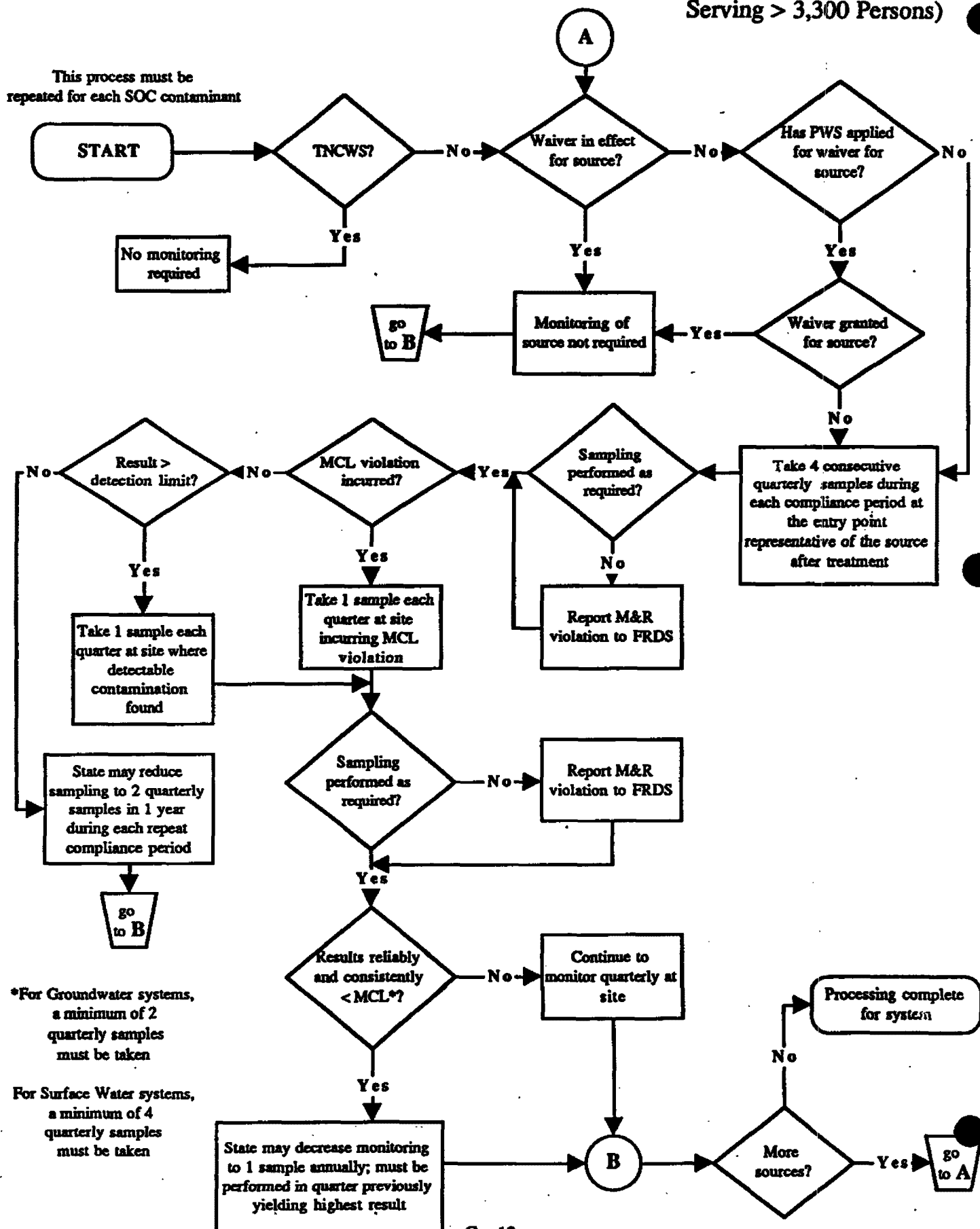
# IOC (other than Asbestos, Fluoride, Nitrate, Nitrite) M & R Compliance Determination (Surface Water Systems)

This process must be repeated for Barium, Cadmium, Chromium, Mercury, and Selenium



# SOC M&R Compliance Determination (Groundwater and Surface Water Systems Serving > 3,300 Persons)

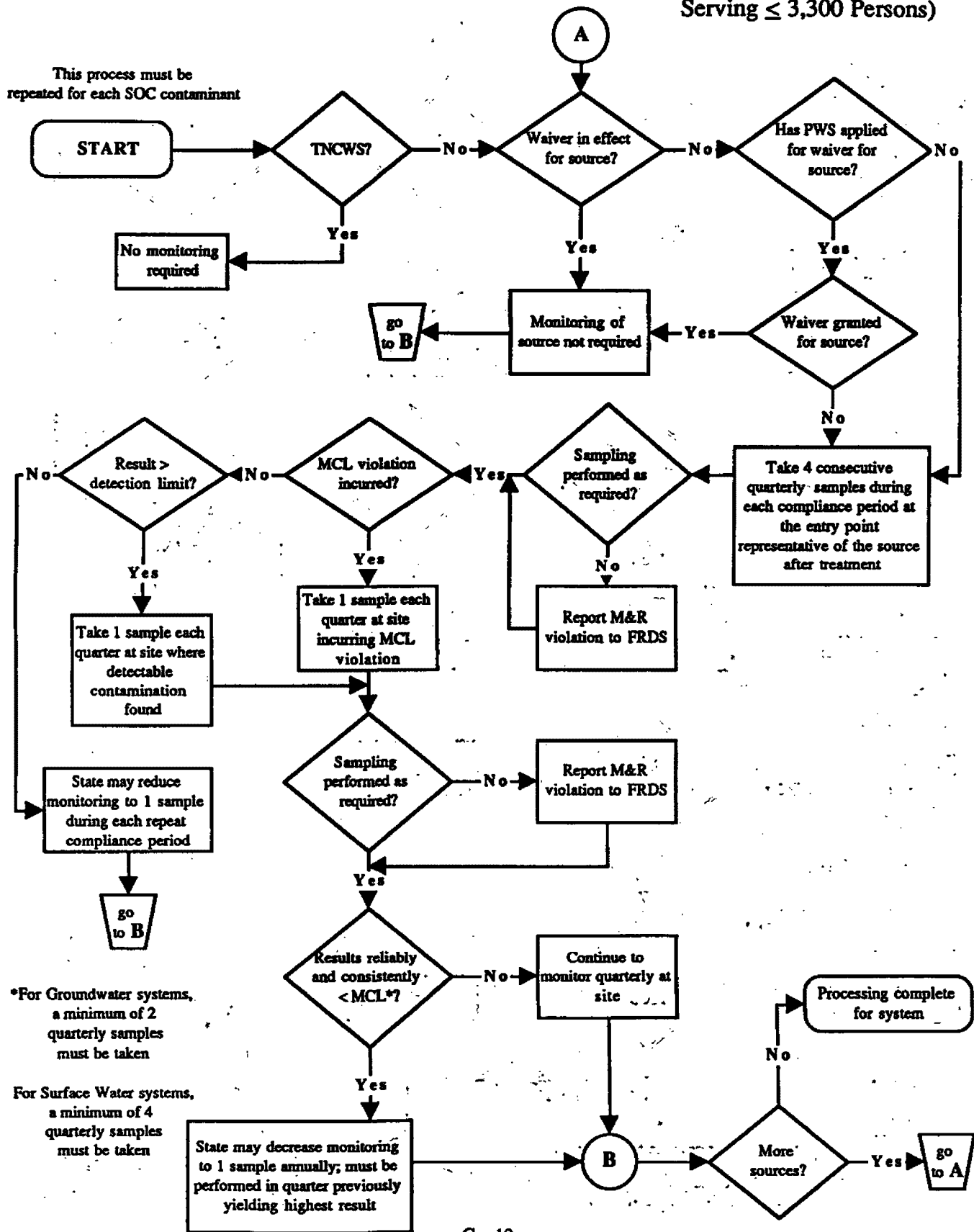
This process must be repeated for each SOC contaminant





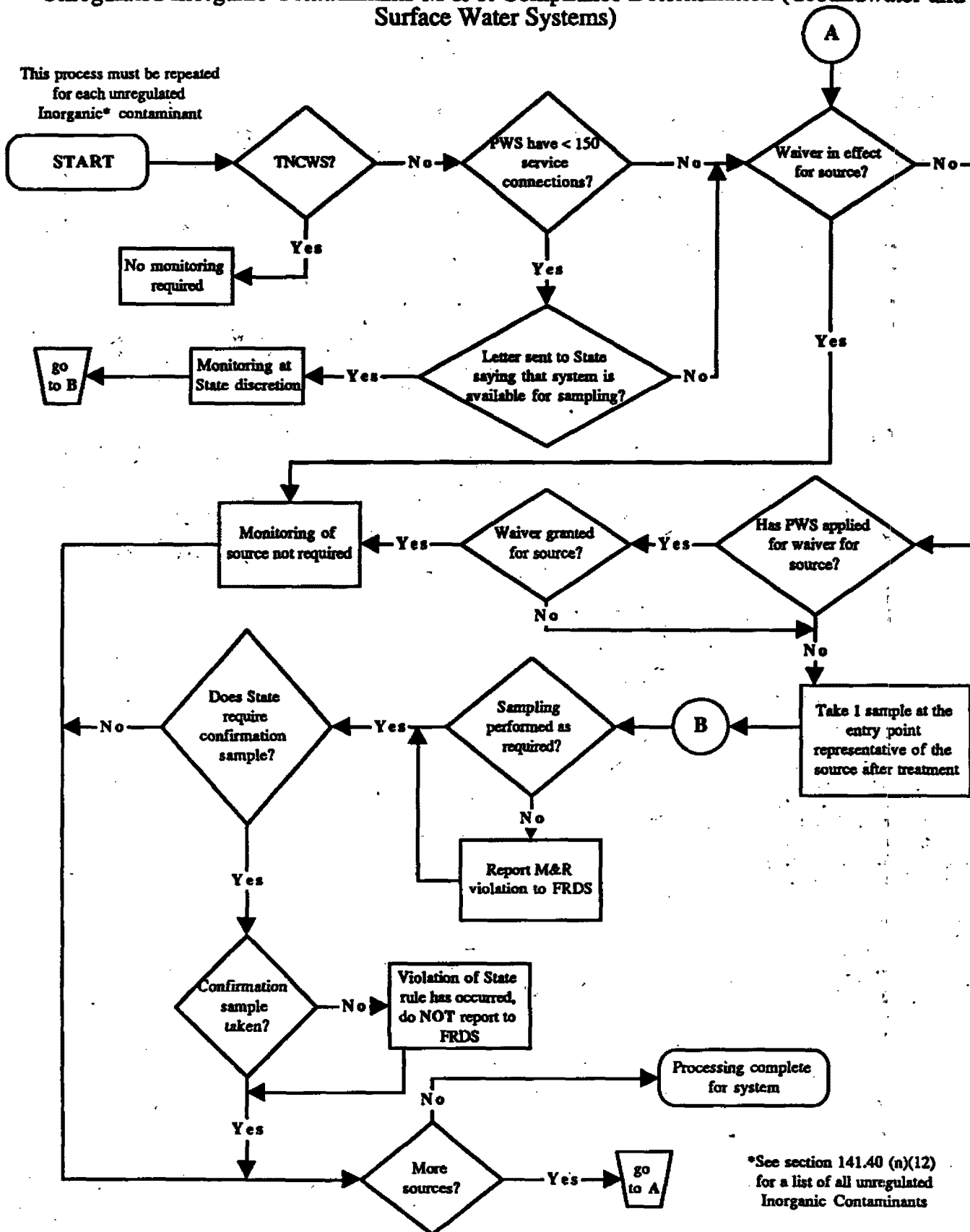
# SOC M&R Compliance Determination (Groundwater and Surface Water Systems Serving $\leq 3,300$ Persons)

This process must be repeated for each SOC contaminant



# Unregulated Inorganic Contaminants M & R Compliance Determination (Groundwater and Surface Water Systems)

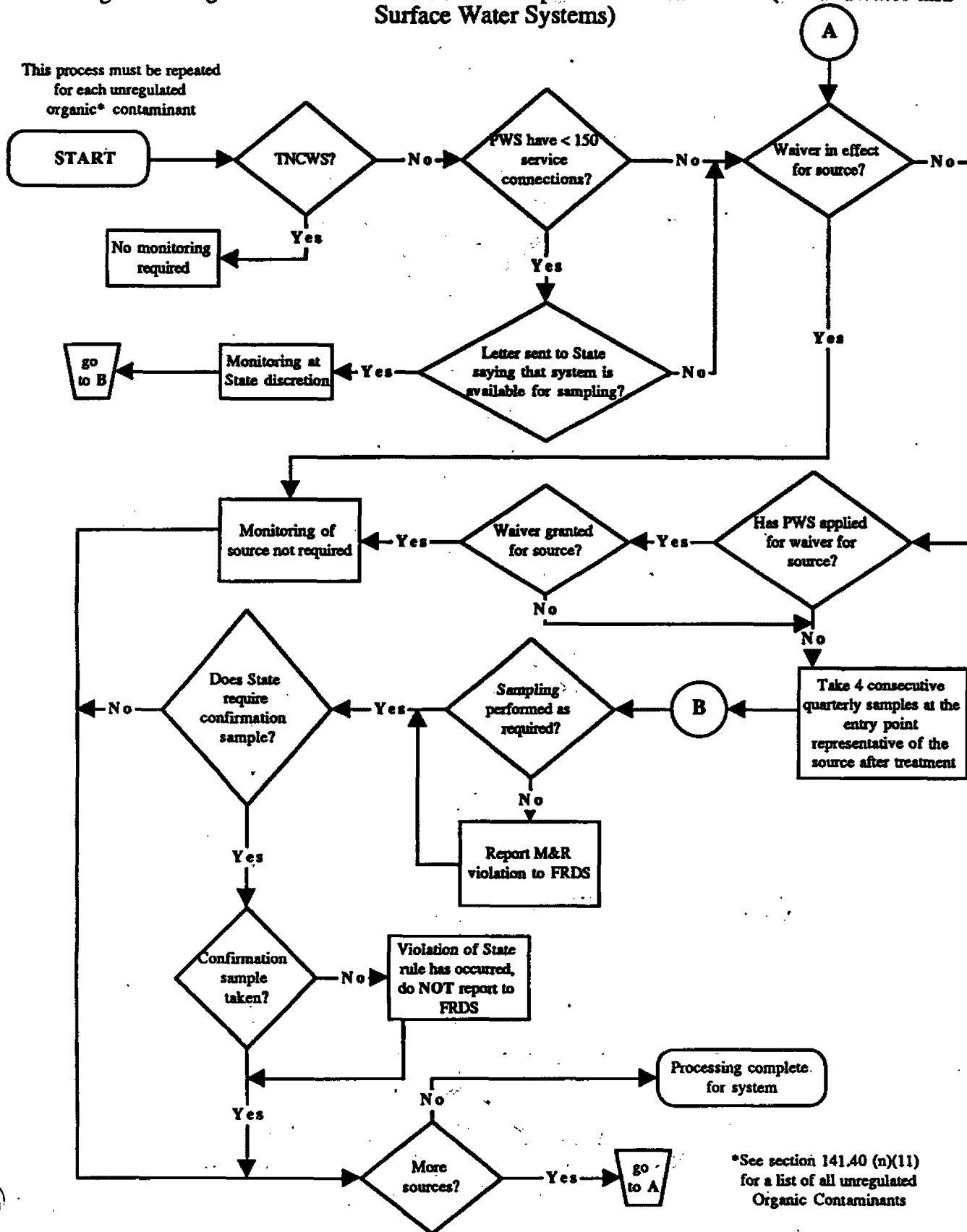
This process must be repeated  
for each unregulated  
Inorganic\* contaminant



\*See section 141.40 (n)(12)  
for a list of all unregulated  
Inorganic Contaminants

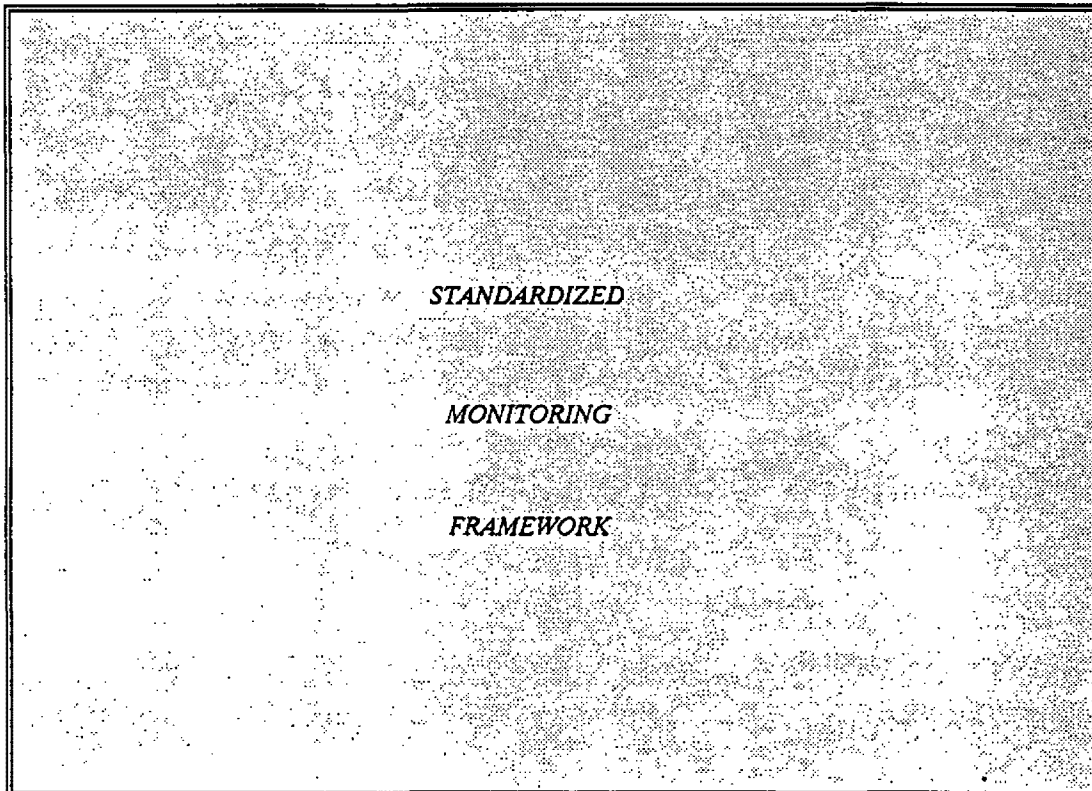
# Unregulated Organic Contaminants M & R Compliance Determination (Groundwater and Surface Water Systems)

This process must be repeated  
for each unregulated  
organic\* contaminant



\*See section 141.40 (n)(11)  
for a list of all unregulated  
Organic Contaminants





*STANDARDIZED*

*MONITORING*

*FRAMEWORK*

ILLUSTRATED BY LITTLE TINY SQUARES



# STANDARDIZED MONITORING FRAMEWORK

## ASBESTOS

( CWSS & NTNCWSS )

YEAR	< MCL	> MCL	WAIVER
1993		■ ■ ■ ■	
1994	■	■ ■ ■ ■	
1995		■ ■ ■ ■	
1996		■ ■ ■ ■	
1997		■ ■ ■ ■	
1998		■ ■ ■ ■	
1999		■ ■ ■ ■	
2000		■ ■ ■ ■	
2001		■ ■ ■ ■	

**Initial Sampling:** All CWSSs and NTNCWSSs must take one sample during the initial compliance period of the first compliance cycle [§141.23(b)(1)].

**Grandfathered Data:** Sampling results must be from between 1/1/90 and 12/31/92 (inclusive) [§141.23(b)(10)].

**Repeat Sampling w/o a Waiver:** If the result of the initial sample is below the MCL, the system must take one sample every nine years during the first compliance period of each compliance cycle [§141.23(b)(1)].

**Exceeding the Trigger Level:** Any CWSS or NTNCWSS exceeding the MCL must take one sample every calendar quarter [§141.23(b)(8)]. If the sampling results fall reliably and consistently below the MCL, the State may reduce the system's sampling frequency for that sampling point to one sample every nine years; taken during the first compliance period of each compliance cycle [§141.23(b)(9)].

**Monitoring Waivers:** Systems granted a monitoring waiver are not required to monitor [§141.23(b)(1)]. The waiver is effective for one three-year compliance period. The waiver must be renewed in the first compliance period of each compliance cycle [§141.23(b)(4)].

# STANDARDIZED MONITORING FRAMEWORK

## NITRATE

( CWSSs, NTNCWSSs, & TNCWSSs )

YEAR	< ½ MCL		> ½ MCL
	SW (CWSSs & NTNCWSSs)	GW & TNCWSSs	ALL
1993	■ ■ ■ ■	■	■ ■ ■ ■
1994	■	■	■ ■ ■ ■
1995	■	■	■ ■ ■ ■
1996	■	■	■ ■ ■ ■
1997	■	■	■ ■ ■ ■
1998	■	■	■ ■ ■ ■
1999	■	■	■ ■ ■ ■
2000	■	■	■ ■ ■ ■
2001	■	■	■ ■ ■ ■

**Initial Sampling:** All Surface water systems (CWSSs & NTNCWSSs) must take one sample every calendar quarter, beginning in 1993. All Groundwater systems (CWSSs & NTNCWSSs) and all TNCWSSs must take one sample every calendar year, beginning in 1993 [§§141.23(d)(1) & 141.23(d)(4)].

**Grandfathered Data:** There are no provisions for grandfathered data.

**Repeat Sampling:** Surface water systems (CWSSs & NTNCWSSs) may reduce their sampling frequency to one sample every calendar year, if the results of the initial four quarterly samples are all below ½ the MCL [§141.23(d)(3)]. Groundwater systems (CWSSs & NTNCWSSs) and TNCWSSs may continue to sample once every calendar year, if the result of the initial sample is below ½ the MCL [§§141.23(d)(1), 141.23(d)(2), and 141.23(d)(4)].

**Exceeding the Trigger Level:** Any CWSS or NTNCWSS having a sample result exceeding ½ the MCL must take one sample every calendar quarter. If the sampling results fall reliably and consistently below the MCL, the State may reduce a system's sampling frequency for that sampling point to one sample every calendar year [§§141.23(d)(2) & 141.23(d)(3)].

**Monitoring Waivers:** Waivers are not authorized for Nitrate.



# STANDARDIZED MONITORING FRAMEWORK

## NITRITE

( CWSSs, NTNCWSSs, & TNCWSSs )

YEAR	< 1/2 MCL	> 1/2 MCL
1993		■ ■ ■ ■
1994	■	■ ■ ■ ■
1995		■ ■ ■ ■
1996		■ ■ ■ ■
1997		■ ■ ■ ■
1998		■ ■ ■ ■
1999		■ ■ ■ ■
2000		■ ■ ■ ■
2001		■ ■ ■ ■

**Initial Sampling:** All systems must take one sample during the initial compliance period (§141.23(e)(1)).

**Grandfathered Data:** There are no provisions for grandfathered data.

**Repeat Sampling:** If the result of the initial sample is below 1/2 the MCL, the system shall sample at a frequency specified by the State (§141.23(e)(2)).

**Exceeding the Trigger Level:** Any system having a sample result exceeding 1/2 the MCL must take one sample every calendar quarter. If the sampling results fall reliably and consistently below the MCL, the State may reduce the system's sampling frequency for that sampling point to one sample every calendar year (§141.23(e)(3)).

**Monitoring Waivers:** Waivers are not authorized for Nitrite.

# STANDARDIZED MONITORING FRAMEWORK

## INORGANIC CHEMICALS

( CWSs & NTNCWSs )

YEAR	< MCL		> MCL	WAIVER
	SW	GW	ALL	
1993	■		■ ■ ■ ■	■
1994	■	■	■ ■ ■ ■	
1995	■		■ ■ ■ ■	
1996	■		■ ■ ■ ■	
1997	■	■	■ ■ ■ ■	
1998	■		■ ■ ■ ■	
1999	■		■ ■ ■ ■	
2000	■	■	■ ■ ■ ■	
2001	■		■ ■ ■ ■	

**Initial Sampling:** All Surface water systems (CWSs & NTNCWSs) must take one sample every calendar year beginning in 1993. All Groundwater systems (CWSs & NTNCWSs) must take one sample during each compliance period beginning in 1993 [§141.23(c)(1)]. Note: Fluoride samples must be taken by CWSs only; they are not required to be taken by NTNCWSs.

**Grandfathered Data:** At least one of three samples must have been taken between 1/1/90 and 12/31/92 (inclusive). The other samples may have been taken before 1990 [§141.23(c)(4)].

**Repeat Sampling w/o a Waiver:** If the result of the initial sample is below the MCL, Surface water systems may continue to sample annually, and Groundwater systems may continue to sample triennially [§141.23(c)(1)].

**Exceeding the Trigger Level:** Any system exceeding the MCL must take one sample every calendar quarter. If the sampling results fall reliably and consistently below the MCL, the State may reduce the system's sampling frequency for that sampling point to annual (Surface water systems) or triennial (Groundwater systems) [§§141.23(c)(7) & 141.23(c)(8)].

**Monitoring Waivers:** Systems granted a monitoring waiver must monitor once every nine calendar years [§141.23(c)(3)].

### Contaminants:

- |            |            |
|------------|------------|
| » Barium   | » Fluoride |
| » Cadmium  | » Mercury  |
| » Chromium | » Selenium |

# STANDARDIZED MONITORING FRAMEWORK

## SYNTHETIC ORGANIC COMPOUNDS

( CWSs & NTNCWSs )

YEAR	< Detection Limit		> Detection Limit	WAIVER
	≤ 3,300	> 3,300	ALL	
1993			■ ■ ■ ■	
1994	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	
1995			■ ■ ■ ■	
1996			■ ■ ■ ■	
1997	■	■ ■	■ ■ ■ ■	
1998			■ ■ ■ ■	
1999			■ ■ ■ ■	
2000	■	■ ■	■ ■ ■ ■	
2001			■ ■ ■ ■	

**Initial Sampling:** All CWSs and NTNCWSs must take four consecutive quarterly samples each compliance period, beginning in 1993 [§141.24(h)(4)].

**Grandfathered Data:** Sampling conducted between 1/1/90 and 12/31/92 (inclusive) may be substituted (grandfathered) for the initial four quarterly samples. This means that one sample collected during that time period may be substituted for the four samples required between 1/1/93 and 12/31/95 (inclusive) [§141.24(h)(14)].

**Repeat Sampling w/o a Waiver:** CWSs or NTNCWSs serving more than 3,300 persons, which have no detects in their initial round of sampling, may reduce their sampling frequency to two quarterly samples in one calendar year during each repeat compliance period [§141.24(h)(4)(i)]. CWSs or NTNCWSs serving 3,300 people or less, which have no detects in their initial round of sampling, may reduce their sampling frequency to one sample during each repeat compliance period [§141.24(h)(4)(iii)].

**Exceeding the Trigger Level:** Any CWS or NTNCWS exceeding the detection limit [see §141.24(h)(18)] must take one sample every calendar quarter. If the sampling results fall reliably and consistently below the MCL, the State may reduce the system's sampling frequency for that sampling point to one sample every calendar year [§141.24(h)(7)].

**Monitoring Waivers:** Systems granted a monitoring waiver are not required to monitor. The vulnerability assessment must be updated every three years [§141.24(h)(5)].

### Contaminants:

- |                               |                                    |
|-------------------------------|------------------------------------|
| » Alachlor                    | » Ethylene dibromide (EDB)         |
| » Aldicarb                    | » Heptachlor                       |
| » Aldicarb sulfone            | » Heptachlor epoxide               |
| » Aldicarb sulfoxide          | » Lindane                          |
| » Atrazine                    | » Methoxychlor                     |
| » Carbofuran                  | » Pentachlorophenol                |
| » Chlordane                   | » Polychlorinated biphenyls (PCBs) |
| » Dibromochloropropane (DBCP) | » Toxaphene                        |
| » 2,4-D                       | » 2,4,5-TP (Silvex)                |

# STANDARDIZED MONITORING FRAMEWORK

## VOLATILE ORGANIC COMPOUNDS

( CWSS & NTNCWSS )

YEAR	< MCL OF 0.0005 mg/l		> 0.0005 mg/l	WAIVER	
	SV	GW	ALL	SV	GW
1993			■ ■ ■ ■		
1994	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■
1995			■ ■ ■ ■		
1996	■	■	■ ■ ■ ■		
1997	■	■	■ ■ ■ ■		
1998	■		■ ■ ■ ■		
1999	■		■ ■ ■ ■		
2000	■	■	■ ■ ■ ■		■
2001	■		■ ■ ■ ■		

**Initial Sampling:** All CVSs and NTNCVSs (Surface water & Groundwater) must take four consecutive quarterly samples each compliance period, beginning in 1993 [§141.24(f)(4)].

**Grandfathered Data:** Sampling conducted between 1/1/88 and 12/31/92 (inclusive) may be substituted (grandfathered) for the initial four quarterly samples, so long as the sampling was conducted in accordance with §141.24(f)(5) and 141.24(f)(18). This means that one sample collected during that time period may be substituted for the four samples required between 1/1/93 and 12/31/95 (inclusive) [§141.24(f)(5)].

**Repeat Sampling w/o a Waiver:** Any CVS or NTNCVS which has no detects in its initial round of sampling may reduce its sampling frequency to one sample every calendar year [§141.24(f)(5)]. Groundwater systems, which have performed three years of sampling with no detects, may be allowed to reduce their sampling frequency to one sample each compliance period [§141.24(f)(6)].

**Exceeding the Trigger Level:** Any CVS or NTNCVS exceeding the detection limit of 0.0005 mg/l must take one sample every calendar quarter. If the sampling results fall reliably and consistently below the MCL, the State may reduce the system's sampling frequency for that sampling point to one sample every calendar year [§141.24(f)(11)].

**Monitoring Waivers:** Groundwater systems granted a monitoring waiver must monitor once every six calendar years. The vulnerability assessment must be updated every six years. During the first waiver period, the vulnerability assessment must be updated within the first three years of that six year period [§141.24(f)(9)]. Surface water systems granted a monitoring waiver must sample at a frequency specified by the State. The vulnerability assessment must be updated every three years [§141.24(f)(10)].

### Contaminants:

- |                        |                              |                           |
|------------------------|------------------------------|---------------------------|
| » Benzene              | » cis-1,2-Dichloroethylene   | » Tetrachloroethylene     |
| » Carbon tetrachloride | » trans-1,2-Dichloroethylene | » Toluene                 |
| » o-Dichlorobenzene    | » 1,2-Dichloropropane        | » 1,1,1-Trichloroethane   |
| » p-Dichlorobenzene    | » Ethylbenzene               | » Trichloroethylene (TCE) |
| » 1,2-Dichloroethane   | » Monochlorobenzene          | » Vinyl chloride          |
| » 1,1-Dichloroethylene | » Styrene                    | » Xylene (total)          |

**STANDARDIZED MONITORING FRAMEWORK**

**UNREGULATED CONTAMINANTS**

( CWSS & NTNCWSS )

YEAR	Inorganics	Organics
1993	■	■ ■ ■ ■
1994		
1995		
1996		
1997		
1998		
1999		
2000		
2001		

**Initial Sampling:** All CWSSs and NTNCWSSs must take one sample for each of the unregulated Inorganic contaminants and four consecutive quarterly samples for each of the unregulated Organic contaminants during the initial compliance period [§§141.40(n)(1) & 141.40(n)(2)]. However, if a system is serving fewer than 150 service connections, it may send a letter to the State (by no later than 1/1/94) indicating that it is available for sampling instead of performing the monitoring indicated above. Such systems monitor at the discretion of the State.

**Repeat Sampling w/o a Waiver:** None

**Monitoring Waivers:** Systems granted a monitoring waiver are not required to monitor [§141.40(n)(4)].

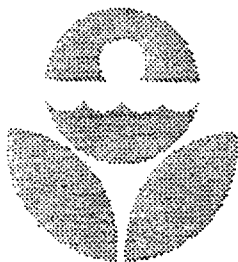
**Contaminants:** See §141.40(n)(12) for a list of the unregulated Inorganic contaminants and §141.40(n)(11) for a list of the unregulated Organic contaminants.



**Appendix E: Summary of Phase II Regulations**







# Summary of Phase II Regulations

---

*National Primary Drinking Water  
Regulations for 38 Inorganic and  
Synthetic Organic Chemicals*

---

July 1991

Office of Ground Water and Drinking Water  
U.S. Environmental Protection Agency  
Washington, DC



6



---

## Preface

The U.S. Environmental Protection Agency (EPA) promulgated National Primary Drinking Water Regulations for 38 inorganic and synthetic organic chemicals on January 30, 1991 and July 1, 1991. Collectively, these two rulemakings are referred to as the Phase II Rule. The following packet of materials summarizes this rule and is intended for use by EPA regional officials, state and water system personnel. The first section of the package consists of a regulatory overview, while the second section consists of a series of 14 fact sheets which describe specific aspects of the rule (i.e., monitoring and analytical requirements, state primacy conditions, public notification, best available technology, variances and exemptions, etc.). The various components of the package have been designed to be used individually or as part of the larger package.

---

# **Table of Contents**

---

---

## **Phase II Summary**

Summary

Key Implementation Dates

Regulatory Impact

Phase II National Primary Drinking Water Regulations (Tables)

Compliance Monitoring Requirements (Table)

Regulatory Development Information

---

## **Phase II Fact Sheet Series**

1. Standardized Monitoring Framework
2. Asbestos
3. Nitrate
4. Nitrite
5. Inorganics
6. Volatile Organic Chemicals
7. Pesticides
8. Unregulated Contaminants
9. Analytical Requirements
10. State Primacy Requirements
11. Public Notification
12. Best Available Technology (BAT) and Variances and Exemptions
13. Cost and Regulatory Impact
14. Secondary Standards

# Phase II Summary

## *National Primary Drinking Water Regulations for 38 Inorganic and Synthetic Organic Chemicals*

July 1991

### Summary

#### **The January and July 1991 rulemakings:**

- The January rulemaking promulgates Maximum Contaminant Level Goals (MCLGs) and Maximum Contaminant Levels (MCLs) or treatment technique requirements for 33 contaminants;
- The July rulemaking promulgates MCLGs and MCLs for aldicarb, aldicarb sulfoxide, aldicarb sulfone, pentachlorophenol, and barium; and
- The January rulemaking becomes effective in July 1992, and the July rulemaking becomes effective in January 1993.

#### **When both rulemakings become effective:**

- The addition of the 38 contaminants regulated under Phase II will raise the number of regulated contaminants to 64. Of the 38 Phase II contaminants, 27 are newly regulated. The remaining 11 contaminants were previously regulated and were revised.
- Phase II:
  - establishes 17 new pesticide MCLs (12 new and five revised MCLs);
  - establishes eight inorganic MCLs (two new and six revised MCLs);
  - establishes 10 new volatile organic MCLs;
  - establishes a new MCL for PCBs;
  - establishes treatment technique requirements for two contaminants; and
  - deletes the MCL for silver.

#### **These rules also include additional provisions for:**

- Analytical methods and laboratory performance requirements;
- Best Available Technologies (BATs) for compliance with the MCLs and for the purpose of issuing variances;
- Secondary standards for silver (0.1 mg/L) and aluminum (0.05 to 0.2 mg/L) to address aesthetic considerations;
- Mandatory health effects language to be used by systems when notifying the public of violations; and
- State reporting, recordkeeping and primacy requirements.

Key Implementation Dates	
January 1991	Standards for 33 contaminants promulgated Standards for 5 contaminants repropose
July 1991	Standards for 5 contaminants promulgated
July 1992	Standards for 33 contaminants effective
January 1993	Standards for 5 contaminants effective Monitoring for 38 contaminants begins

### Regulatory Impact

- These regulations will reduce the exposure of three million consumers to the regulated contaminants and result in an estimated reduction of 75 cancer cases per year.
- Pesticides are expected to result in the most violations and the greatest costs and benefits.
- Total costs to all public water systems will be approximately \$88 million per year (\$64 million to treat and \$24 million to monitor).
- Total state implementation costs will be \$21 million initially and \$17 million in future years.
- Additional monitoring will be required for 200,000 systems.
  - 80,000 community and nontransient, noncommunity systems must monitor for all contaminants.
  - 120,000 transient, noncommunity systems must monitor for nitrate and nitrite.
  - Monitoring requirements will be standardized to 3/6/9 year cycles.
  - Monitoring will generally cost less than \$10 per household per year.
- Approximately 3300 or three percent of all public water systems will be required to provide treatment or find an alternate source of water.
  - Exemptions will be allowed for small systems based on costs.
  - Treatment will cost \$10 to \$800 per household depending upon system size, degree of contamination, and other factors.

# Phase II National Primary Drinking Water Regulations

Contaminants	Drinking Water Health Effects	EPA Standards (mg/L) <sup>1</sup>			Sources	EPA Analytic Methods <sup>2</sup>	BAT
		Final MCLG	Final MCL	Current MCL			
Inorganics							
Asbestos	benign tumors	7 MFL <sup>3</sup>	7 MFL <sup>3</sup>	-	natural mineral deposits; also in Asbestos/Cement (A/C) pipe	TEM <sup>4</sup>	C/F; DF; DMF; CC
Barium	circulatory system	2	2	1	natural mineral deposits; oil/gas drilling operations; paint & other industrial uses	200.7, 208.1, 208.2	IE; LS; RO; ED
Cadmium	kidney	0.005	0.005	0.01	natural mineral deposits; metal finishing; corrosion product in plumbing	200.7, 213.1, 213.2	C/F; LS; RO; IE
Chromium	liver/kidney, skin, and digestive system	0.1	0.1	0.05	natural mineral deposits; metal finishing, textile, tanning and leather industries	200.7, 218.1, 218.2	C/F; LS; RO; IE
Mercury	kidney, nervous system	0.002	0.002	0.002	industrial/chemical manufacturing; fungicide; natural mineral deposits	245.1, 245.2	GAC; LS; C/F; RO
Nitrate	methemoglobinemia "blue-baby syndrome"	10	10	10	fertilizers, feedlots, sewage; naturally in soil, mineral deposits	300, 352.1, 353.1, 353.2, 353.3	IE; RO; EDR
Nitrite	methemoglobinemia "blue-baby syndrome"	1	1	-	unstable, rapidly converted to nitrate; prohibited in working metal fluids	300, 353.2, 353.3, 354.1	IE; RO
Total Nitrate/Nitrite		10	10	-			
Selenium	nervous system	0.05	0.05	0.01	natural mineral deposits; by-product of copper mining/smeltering	270.2	EDR; C/F; AA; LS; RO

<sup>1</sup> Final MCLGs and MCLs become effective July 1992, except for barium. At that time, the current MCLs cease to be effective. The MCL for barium becomes effective January 1993.

<sup>2</sup> Additional methods may be permitted for the inorganic chemicals; consult the rule for more information.

<sup>3</sup> MFL = million fibers per liter, with fiber length > 10 microns.

<sup>4</sup> TEM = Transmission Electron Microscopy.

# Phase II National Primary Drinking Water Regulations

Contaminants	Drinking Water Health Effects	EPA Standards (mg/L) <sup>1</sup>			Sources	EPA Analytic Method	BAT
		Final MCLG	Final MCL	Current MCL			
Volatile Organics							
o-Dichlorobenzene	nervous system, lung, liver, kidney	0.6	0.6	-	Industrial solvent; chemical manufacturing	502.1, 502.2, 503.1, 524.1, 524.2	All VOCs; GAC/PTA
cis-1,2-Dichloroethylene	nervous system, liver, circulatory	0.07	0.07	-	Industrial extraction solvent	502.1, 502.2, 503.1, 524.1, 524.2	
trans-1,2-Dichloroethylene	nervous system, liver, circulatory	0.1	0.1	-	Industrial extraction solvent	502.1, 502.2, 503.1, 524.1, 524.2	
1,2-Dichloropropane	probable cancer, liver, lungs, kidney	0	0.005	-	soil fumigant; industrial solvent	502.1, 502.2, 524.1, 524.2	
Ethylbenzene	kidney, liver, nervous system	0.7	0.7	-	present in gasoline & insecticides; chemical manufacturing	502.2, 503.1, 524.1, 524.2	
Monochlorobenzene	kidney, liver, nervous system	0.1	0.1	-	pesticide manufacturing; metal cleaner; industrial solvent	502.1, 502.2, 503.1, 524.1, 524.2	
Styrene	liver, nervous system	0.1	0.1	-	plastic manufacturing; resins used in water treatment equipment	502.2, 503.1, 524.1, 524.2	
Tetrachloroethylene	probable cancer	0	0.005	-	dry cleaning/industrial solvent	502.1, 502.2, 503.1, 524.1, 524.2	
Toluene	kidney, nervous system, lung	1	1	-	chemical manufacturing; gasoline additive; industrial solvent	502.2, 503.1, 524.1, 524.2	
Xylenes	liver, kidney, nervous system	10	10	-	paint/ink solvent; gasoline refining by-product; component of detergents	502.2, 503.3, 524.1, 524.2	

<sup>1</sup> Final MCLGs and MCLs become effective July 1992, except for barium. At that time, the current MCLs cease to be effective. The MCL for barium becomes effective January 1993.



# Phase II National Primary Drinking Water Regulations

Contaminants	Drinking Water Health Effects	EPA Standards (mg/L) <sup>1</sup>			Sources	EPA Analytic Method	BAT
		Final MCLG	Final MCL	Current MCL			
Pesticides and PCBs							
Alachlor (Lasso)	probable cancer	0	0.002	-	herbicide on corn and soybeans; under review for cancellation	505, 507, 525.1	GAC
Aldicarb (Temik)	nervous system	0.001	0.003	-	insecticide on cotton, potatoes; restricted in many areas due to gw contamination	531.1	GAC
Aldicarb sulfoxide	nervous system	0.001	0.004	-	degraded from aldicarb by plants	531.1	GAC
Aldicarb sulfone	nervous system	0.001	0.002	-	degraded from aldicarb by plants	531.1	GAC
Alrazine (Alranex, Crisazina)	reproductive and cardiac	0.003	0.003	-	widely used herbicide on corn and on non-crop land	505, 507, 525.1	GAC
Carbofuran (Furadan 4F)	nervous system and reproductive	0.04	0.04	-	soil fumigant/insecticide on corn/cotton; restricted in some areas	531.1	GAC
Chlordane	probable cancer	0	0.002	-	soil insecticide for termite control on corn, potatoes; most uses cancelled in 1980	505, 508, 525.1	GAC
Dibromochloropropane (DBCP, Nematume)	probable cancer	0	0.0002	-	soil fumigant on soybeans, cotton; cancelled in 1977	504	GAC/PTA
2,4-D (Formula 40, Weedar 64)	liver, kidney, nervous system	0.07	0.07	0.1	herbicide for wheat, corn, rangelands	515.1	GAC
Ethylene dibromide (EDB, Bromofume)	probable cancer	0	0.00005	-	gasoline additive; soil fumigant; solvent; cancelled in 1984; limited uses continue	504	GAC/PTA
Heptachlor (H-34, Heptox)	probable cancer	0	0.0004	-	insecticide on corn; cancelled in 1983 for all but termite control	505, 508, 525.1	GAC
Heptachlor epoxide	probable cancer	0	0.0002	-	soil & water organisms convert heptachlor to the epoxide	505, 508, 525.1	GAC

<sup>1</sup> Final MCLGs and MCLs become effective July 1992, except for barium. At that time, the current MCLs cease to be effective. The MCL for barium becomes effective January 1993.

# Phase II National Primary Drinking Water Regulations

Contaminants	Drinking Water Health Effects	EPA Standards (mg/L) <sup>1</sup>			EPA Analytic Method	BAT
		Final MCLG	Final MCL	Current MCL		
Pesticides and PCBs (cont'd)						
Lindane	nervous system, liver, kidney	0.0002	0.0002	0.004	insecticide for seed, lumber, livestock; pest control; most uses restricted in 1983	505, 508, 525.1 GAC
Methoxychlor (DMDT, Marlate)	nervous system, liver, kidney,	0.04	0.04	0.1	insecticide on alfalfa, livestock	505, 508, 525.1 GAC
Polychlorinated biphenyls (PCBs, Aroclor)	probable cancer	0	0.0005	-	electrical transformers, plasticizers; banned in 1979	505 and 508 (screen), 508A (quantitate) GAC
Pentachlorophenol	probable cancer, liver, kidney	0	0.001	-	wood preservative & herbicide; non-wood uses banned in 1987	515.1, 525.1 GAC
Toxaphene	probable cancer	0	0.003	0.005	insecticide/herbicide for cotton, soybeans; cancelled in 1982	505, 508, 525.1 GAC/PTA
2,4,5-TP (Silvex)	nervous system, liver, kidney	0.05	0.05	0.01	herbicide on rangelands, sugarcane, golf courses; cancelled in 1983.	515.1 GAC
Treatment Techniques						
Acrylamide	probable cancer, nervous system	0	0.05% dosed at 1 mg/L		flocculents in sewage/ wastewater treatment	none PAP
Epichlorohydrin	probable cancer, liver, kidney, lungs	0	0.01% dosed at 20 mg/L		epoxy resins & coalings, flocculents used in treatment	none PAP

## Best Available Technology Key:

AA = Activated Alumina	EDR = Electrodialysis Reversal	LS = Lime Softening
C/F = Coagulation/Filtration	CC = Corrosion Control	RO = Reverse Osmosis
DF = Direct Filtration	GAC = Granular Activated Charcoal	PAP = Polymer Addition Practices
DMF = Diatomite Filtration	IE = Ion Exchange	PTA = Packed Tower Aeration

<sup>1</sup> Final MCLGs and MCLs become effective July 1992, except for barium. At that time, the current MCLs cease to be effective. The MCL for barium becomes effective January 1993.

# Compliance Monitoring Requirements

Contaminant	Base Requirement		Trigger that Increases Sampling	Waivers for Base Requirements
	Ground water	Surface water		
Asbestos	1 Sample every 9 years		> MCL	YES Based on VA <sup>1</sup>
Nitrate	Annual	Quarterly	≥ 50% MCL	NO
	After 1 year < 50% of MCL, SWS may reduce to an annual sample			
Nitrite	1 Sample: If < 50% of MCL, state discretion		≥ 50% MCL	NO
5 Inorganics	1 Sample every 3 years	Annual sample	> MCL	YES Based on analytical results of 3 rounds
18 VOCs	4 Quarterly samples every 3 years Annual after 1 year of no detects		> 0.0005 mg/L	YES Based on VA <sup>1</sup>
17 Pesticides and PCBs	4 Quarterly samples every 3 years After 1 round of no detects: systems >3300 reduce to 2 samples per year every 3 years; systems ≤ 3300 reduce to 1 sample every 3 years		Method Detection Limit (MDL)	YES Based on VA <sup>1</sup>
Unregulated - 6 IOCs - 24 SOCs	1 Sample 4 Consecutive quarterly samples		N.A.	YES Based on VA <sup>1</sup>

<sup>1</sup> VA = Vulnerability Assessment



3

6



# Standardized Monitoring Framework

## EPA Phase II Fact Sheet Series (1 of 14)

July 1991

*This fact sheet summarizes the U.S. Environmental Protection Agency's (EPA) Standardized Monitoring Framework as promulgated under the Agency's Phase II Rule. Monitoring in accordance with the framework begins in January 1993.*

### Purpose

The primary objective of the Standardized Monitoring Framework is to reduce the variability and complexity of drinking water monitoring requirements. The objective is achieved through the standardization of monitoring requirements and the synchronization of monitoring schedules across "rules" and contaminant groups.

### Applicability

The Standardized Monitoring Framework currently applies to the 38 contaminants contained in EPA's Phase II Rule. However, the framework was designed to eventually apply to most source-related contaminants including volatile organic chemicals, pesticides, inorganic chemicals, and radionuclides. Subsequent regulations issued by EPA for such contaminants will, in general, contain monitoring requirements that "fit" or fall within the Standardized Monitoring Framework. In general, the Standardized Monitoring Framework applies to all community water systems and all nontransient, noncommunity water systems. For some contaminants (i.e., nitrate and nitrite), the Standardized Monitoring Framework also applies to transient, noncommunity water systems.

### The Framework

To standardize monitoring requirements across rules and contaminant groups, EPA has established a **nine-year** (based on a calendar year) **compliance "cycle,"** with the first cycle beginning on January 1, 1993. The nine year compliance cycle contains three **three-year compliance "periods."** The first three-year compliance period extends from 1993 to 1995, the second period from 1996 to 1998, and the third from 1999 to 2001. The second nine-year compliance cycle begins in 2002 and extends through 2010.

The Standardized Monitoring Framework encompasses both sampling and vulnerability assessment activities. The framework provides states the flexibility to determine at which point in a compliance period systems must conduct sampling activities. EPA is requiring states to schedule one-third of their systems for sampling in 1993, another one-third in 1994, and the final one-third in 1995. States may wish to prioritize sampling based on system size, vulnerability, lab capacity, and community/noncommunity criteria. Once a

#### Standardized Monitoring Framework

##### Compliance Cycle 1

- Period 1  
(1993, 1994, 1995)
- Period 2  
(1996, 1997, 1998)
- Period 3  
(1999, 2000, 2001)

##### Compliance Cycle 2

- Period 1  
(2002, 2003, 2004)

↓ to 2010

system is scheduled to sample within a particular three-year compliance period (e.g., the second year in the compliance period), the system must then sample in the same year in subsequent compliance periods (e.g., the second year).

Initial sampling for contaminants under EPA's Phase II Rule begins in the three-year compliance period starting January 1, 1993. Repeat sampling for applicable systems is to take place during the compliance periods 1996 to 1998 and 1999 to 2001. In subsequent EPA regulations, the initial sampling period for contaminants will be during the first full three-year compliance period following the effective date of the ruling (i.e., 18 months after the date of promulgation). For example, if Phase V (covering additional inorganic and synthetic organic chemicals) is promulgated in March 1992, the effective date of the ruling would be September 1993 (the middle of a compliance period). The initial round of sampling for Phase V contaminants would then take place during the 1996 to 1998 compliance period.

### Specific Standardized Monitoring Requirements

*(To learn how these requirements are applied to the 38 contaminants covered under the Phase II Rule, consult Fact Sheets 2 through 8 of EPA's Phase II Fact Sheet Series.)*

- All systems must sample at a base (or minimum) sampling frequency which is specified by EPA for each contaminant or group of contaminants unless a waiver has been granted by the state (see waiver section below).
- Initial base sampling requirements are the same for all systems regardless of system size or water source, except for the Phase II inorganic contaminants.
- Repeat base sampling requirements are generally the same for all systems regardless of system size and water source, with the exception of pesticides. Generally, repeat base sampling requirements can be reduced if initial sampling results in no detects of a contaminant.
- All systems which "detect" a contaminant must conduct quarterly sampling until the state determines that the analytical results are "reliably and consistently" below the maximum contaminant level (MCL). Detection is defined separately for each contaminant or group of contaminants at either the MCL, 50 percent of the MCL, or at the analytical method detection limit (MDL). After detection, groundwater systems must take a minimum of two quarterly samples and surface water systems must take a minimum of four quarterly samples before the state can determine that the analytical results are "reliably and consistently" below the MCL.
- "Reliably and consistently" below the MCL means that though a system detects contaminants in its water supply, it has sufficient knowledge of the source or extent of the contamination to predict that the MCL would not be exceeded in the future. Wide variations in the analytical results or an analytical result which is close to the MCL are examples of situations where systems would not meet the "reliably and consistently" test.

### Grandfathering of Data

- Sampling data collected three years prior to the beginning of an initial three-year compliance period may be used to satisfy a system's initial

sampling requirements. Such "grandfathering of data" would enable an eligible system to sample at repeat frequencies which are generally lower than initial frequencies.

- Vulnerability assessments may not be grandfathered.

### **Waivers**

- Waivers of sampling requirements are available to all systems and are based upon a vulnerability assessment and/or the analytical results of previous sampling.
- Waiver determinations are to be made by the state on a contaminant-specific basis.
- Vulnerability assessments may be conducted by the state, a system, or a third-party organization. States are to approve all assessments.
- Systems which do not receive waivers must sample at required base frequencies.
- There are two basic types of waivers:
  - 1) **Waiver by Rule:** Systems meet EPA-specified criteria (i.e., three analytical results less than the MCL).
  - 2) **Waiver by Vulnerability Assessment** (two-step process):

**Step 1—Use Waiver:** A determination is made whether a given contaminant was used, manufactured, and/or stored in a system area. If the answer to the inquiry is yes or unknown, the system is "susceptible" to contamination and a "use waiver" cannot be granted.

**Step 2—Susceptibility Waiver:** If a "use waiver" cannot be granted, a system may conduct a thorough vulnerability assessment of the water source to determine the system's "susceptibility" to contamination. Susceptibility is to be based on: a) prior analytical and/or vulnerability assessment results, b) environmental persistence and transport of the contaminant, c) how well the source is protected, d) wellhead protection program reports, and e) elevated nitrate levels.

Systems with no known "susceptibility" to contamination (based upon an assessment of the above factors), may be granted a "susceptibility waiver." If "susceptibility" cannot be determined, a system is not eligible for a waiver and must sample at the regulatory minimum or base sampling frequency.





# Asbestos

## EPA Phase II Fact Sheet Series (2 of 14)

July 1991

*This fact sheet summarizes the monitoring requirements for asbestos as promulgated under the U.S. Environmental Protection Agency's (EPA) Phase II Rule. Monitoring for asbestos begins in January 1993.*

### Systems Affected

All community water systems (CWS) and nontransient, noncommunity water systems (NTWS) must comply with the monitoring requirements for asbestos

### Sampling Points

- 1) If asbestos occurs in the source water, sampling must be conducted at each entry point to the distribution system which is representative of the well or source water after treatment.
- 2) Systems that are vulnerable to asbestos contamination, either due to asbestos-cement pipe and/or the corrosivity of the water and source water conditions, shall take one sample at a tap served by asbestos-cement pipe and under conditions where asbestos contamination is most likely to occur.

### Initial Base Sampling

Between 1993 and 1995, all systems must take one sample at each sampling point unless a waiver has been granted by the state (see below for summary of waiver requirements). The state will designate the year in which each system samples within this compliance period.

### Grandfathering

States may allow previous sampling data to satisfy the initial base sampling requirements, provided the sampling data was collected after January 1, 1990.

### Repeat Base Sampling

If results of the initial sample do not exceed the maximum contaminant level (MCL) for asbestos, then the system would not be required to take repeat samples until the start of the next nine-year compliance cycle (2002 to 2005).

### Trigger for Increased/Decreased Sampling

The MCL for asbestos is the trigger for increased/decreased sampling (see sidebar for the MCL).

#### Regulated Contaminant

Contaminant  
Asbestos

MCL  
7 Million Fibers/Liter  
(MFL)—(longer than  
10 micrometers)

---

### Increased Sampling (If MCL is exceeded)

- 1) Any system exceeding the MCL for asbestos must take quarterly samples (i.e., the quarter immediately following the violation). A system must continue quarterly sampling until a baseline is established (minimum of two quarters for *groundwater systems* and four quarters for *surface water systems*).
- 2) If the state determines that the baseline is "reliably and consistently" below the MCL, the sampling frequency may be reduced to the base requirements.

---

### Confirmation Samples

States may require a confirmation sample for any sample that exceeds the MCL. These confirmation samples must be taken within two weeks from the same sampling point and as soon as possible after the initial sample. If a confirmation sample is used, compliance is based on the average of the results of both the confirmation and initial samples.

---

### Compliance Determination

- 1) If a system samples more frequently than annual (i.e., quarterly), the system would be in violation if the running annual average at any sampling point exceeds the MCL.
- 2) If a system samples on an annual or less frequent basis (i.e., every three years), the system would be in violation if one sample (or the average of the initial and confirmation samples) at any point exceeds the MCL.

---

### Public Notice

A system in violation of the National Primary Drinking Water Regulation (i.e., MCL, monitoring and reporting requirements, etc.) for asbestos must give public notice. For a MCL violation, systems must issue a public notice that includes the specific mandatory health effects language contained in the Phase II Rule. Systems must publish the notice in the newspaper within 14 days and deliver the notice to consumers within 45 days. For monitoring violations, systems must notify consumers through major newspapers within three months.

---

### Compositing

Composite samples are allowed at state discretion from no more than five sampling points. Compositing of samples must be completed in a certified drinking water laboratory.

- 1) For systems serving greater than ( $>$ ) 3300 persons, compositing is only allowed at sampling points within a single system.
- 2) For systems serving less than ( $\leq$ ) 3300 persons, compositing among different systems is permitted.

---

### Waivers

States may grant a waiver if, on the basis of a vulnerability assessment, the system determines it is not vulnerable to asbestos contamination. The state may grant a waiver based on consideration of the following factors:

- 
- 1) potential asbestos contamination of the water source and
  - 2) the use of asbestos-cement pipe for finished water distribution and the corrosive nature of the water.

If the state grants a waiver, base sampling requirements are eliminated. Waivers are effective for one three-year compliance period. A new waiver is required in the first compliance period of each nine-year compliance cycle. If waivers are not renewed, systems must sample according to base requirements (i.e., one sample at each sampling point every nine years).

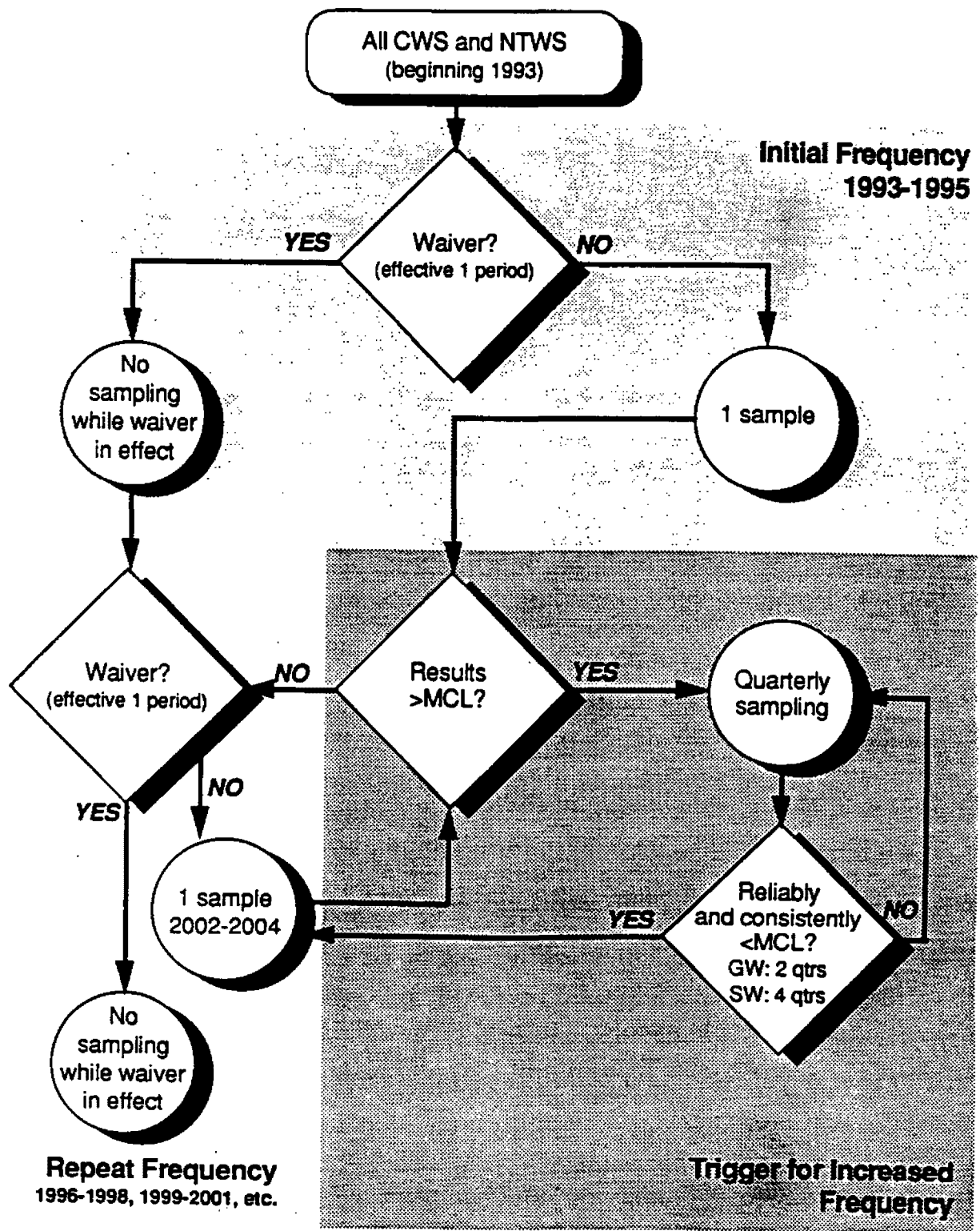
# Standardized Monitoring Framework: Asbestos (CWS and NTWS)

	CALENDAR YEAR		BASE REQUIREMENTS	WAIVERS (ALL SYSTEMS)
	1991			
	1992			
First 9 - year Compliance Cycle	1993	Initial Monitoring Round	1 sample at each sampling point	Yes: Waivers Based on Vulnerability Assessment (No Samples Required)
	1994			
	1995			
	1996	Repeat Monitoring	No Requirements	Not Applicable
	1997			
	1998			
	1999	Repeat Monitoring	No Requirements	Not Applicable
	2000			
	2001			
Begins Second 9 - year Cycle	2002	Repeat Monitoring Round	1 sample at each sampling point	Yes: Waivers Based on Vulnerability Assessment
	2003			
	2004			

## NOTES

- States will designate the year during each compliance period in which each system must sample.
- EPA is requiring states to schedule one-third of their systems for sampling in 1993, another one-third in 1994, and the final one-third in 1995.

# Asbestos Monitoring Flow Chart





3

4



# Nitrate

## EPA Phase II Fact Sheet Series (3 of 14)

July 1991

*This fact sheet summarizes the monitoring requirements for nitrate as promulgated under the U.S. Environmental Protection Agency's (EPA) Phase II Rule. Monitoring for nitrate begins in January 1993.*

### Systems Affected

All community water systems (CWS), transient and nontransient, noncommunity water systems (TWS and NTWS) must comply with the monitoring requirements for nitrate.

### Sampling Points

Sampling must be conducted at each entry point to the distribution system. Sampling points must be representative of the well or source water after treatment.

### Initial Base Sampling

Sampling for nitrate is to be conducted by all water systems beginning January 1, 1993. The frequency of initial sampling is as follows:

**CWS and NTWS:** *Groundwater systems* must sample annually while *surface water systems* must sample quarterly.

**TWS:** All systems regardless of the water source must sample annually.

### Grandfathering

Not allowed.

### Trigger for Increased/Decreased Sampling

Any sample greater than ( $\geq$ ) 50 percent of the MCL triggers the need for increased sampling. Analytical results less than ( $<$ ) 50 percent of the MCL for a minimum of one round of sampling can trigger decreased sampling requirements. **The trigger is not applicable to transient, noncommunity water systems.** (See side bar for MCL and trigger level.)

#### Regulated Contaminant

##### MCL

10 mg/L (as Nitrogen)

##### Trigger

5 mg/L (as Nitrogen)

### Repeat Base Sampling ( $<50\%$ MCL)

**CWS and NTWS:** *Groundwater systems* must continue sampling on an annual basis as during the initial sampling phase. States may reduce the sampling frequency to annual for *surface water systems* provided the analytical results from four consecutive quarters is less than ( $<$ ) 50 percent of the MCL (i.e., 5 mg/L). For systems sampling annually, repeat samples must be taken during the quarter(s) which yielded the highest analytical results.

**TWS:** Same as initial sampling requirements (i.e., annual).





# Nitrite

## EPA Phase II Fact Sheet Series (4 of 14)

July 1991

*This fact sheet summarizes the monitoring requirements for nitrite as promulgated under the U.S. Environmental Protection Agency's (EPA) Phase II Rule. Monitoring for nitrite begins in January 1993.*

### Systems Affected

All community water systems (CWS), transient and nontransient, noncommunity water systems (TWS and NTWS) must comply with the monitoring requirements for nitrite.

### Sampling Points

Sampling must be conducted at each entry point to the distribution system. Sampling points must be representative of the well or source water after treatment.

### Initial Base Sampling

Between 1993 and 1995, each system must take one sample. The state will designate the year in which each system samples within this compliance period.

### Grandfathering

Not allowed.

### Trigger for Increased/Decreased Sampling

The trigger for increased/decreased sampling for nitrite is 50 percent of the MCL (i.e., 0.5 mg/L). (See side bar for MCL and trigger level.)

### Repeat Base Sampling (<50% MCL)

If the results of initial sampling are less than (<) 50 percent of the MCL, repeat sampling requirements (if any) will be at state discretion.

### Increased Sampling (≥50% MCL or ≥MCL)

- 1) Systems collecting any sample(s) greater than (≥) 50 percent of the MCL must sample quarterly for at least one year.
- 2) States may decrease the sampling frequency to annual provided the results of four consecutive quarterly samples are "reliably and consistently" below the MCL.

#### Regulated Contaminant

##### MCL

1 mg/L (as Nitrogen)

##### Trigger

0.5 mg/L (as Nitrogen)

- 3) Systems sampling annually must take subsequent samples during the quarter(s) which previously yielded the highest analytical result(s).

### **Confirmation Samples**

Systems must take a confirmation sample within 24 hours after the results the initial sample are found to be greater than ( $\geq$ ) the MCL. Systems unable meet the 24-hour confirmation sampling requirement must issue a public notice to consumers of the system and must then analyze a confirmation sample within two weeks of receiving the results of the initial sample.

### **Compliance Determination**

If any sample exceeds the MCL for nitrite, systems must take a confirmation sample. The compliance determination is based on the average of the results the initial and confirmation samples.

### **Public Notice**

Any system violating the National Primary Drinking Water Regulation (i.e., MCL, monitoring and reporting requirements, etc.) for nitrite must give public notice. For a violation of the MCL, a system must 1) give notice by electronic media (e.g., TV, radio), 2) publish a notice in the newspaper, and 3) deliver a notice to each consumer within 45 days. The notice must include the specific mandatory health effects language contained in the Phase II Rule. The public notice requirements also apply to systems unable to take confirmation sample within a 24-hour time period (see confirmation sample section above). For monitoring violations a system must notify consumers via newspaper within three months.

### **Compositing**

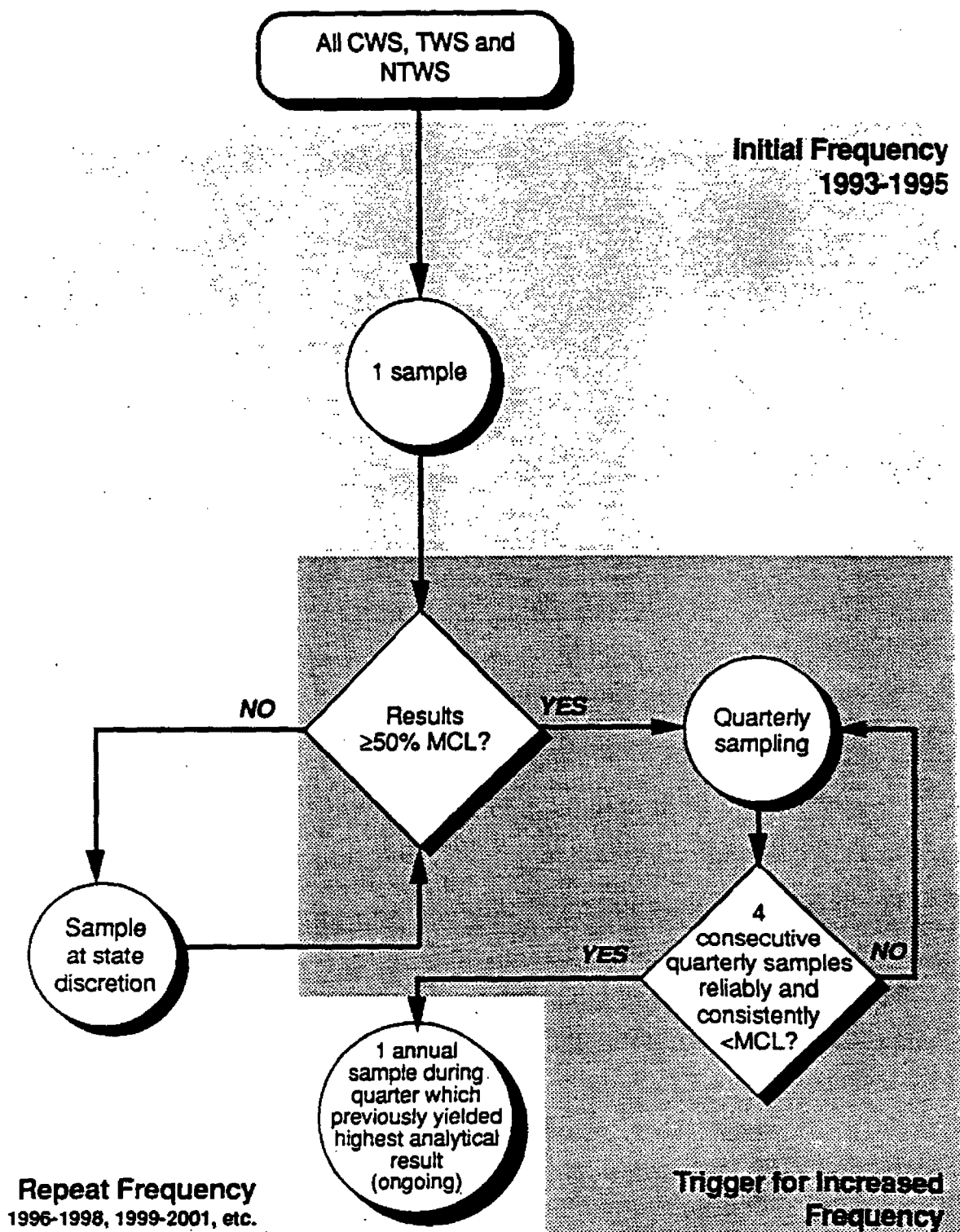
Composite samples are allowed at state discretion from no more than five sampling points. Compositing of samples must be completed in a certified drinking water laboratory.

- 1) For systems serving greater than ( $>$ ) 3300 persons, compositing is only allowed at sampling points within a single system.
- 2) For systems serving less than ( $\leq$ ) 3300 persons, compositing among different systems is permitted.

### **Waivers**

Not allowed.

# Nitrite Monitoring Flow Chart





# Inorganics

## EPA Phase II Fact Sheet Series (5 of 14)

July 1991

*This fact sheet summarizes the monitoring requirements for five inorganic chemicals (barium, cadmium, chromium, mercury, and selenium) as promulgated under the U.S. Environmental Protection Agency's (EPA) Phase II Rule. Monitoring for these contaminants begins in January 1993.*

### Systems Affected

All community water systems (CWS) and nontransient, noncommunity water systems (NTWS) must comply with the monitoring requirements for barium, cadmium, chromium, mercury, and selenium.

### Sampling Points

Sampling must be conducted at each entry point to the distribution system. Sampling points must be representative of the well or source water after treatment.

### Initial Base Sampling

**Groundwater systems** must take one sample during the compliance period 1993 to 1995. The state will designate the year in which each system must sample within this compliance period. **Surface water systems** must sample annually beginning in 1993. Waivers from sampling may be granted by the state (see below for a summary of waiver requirements).

### Grandfathering

States may allow previous sampling data to satisfy the initial base sampling requirements, provided at least one sample was taken after January 1, 1990.

### Repeat Base Sampling

Repeat base sampling requirements are the same as those for the initial base phase unless a waiver has been granted by the state (i.e., one sample per three-year compliance period for **groundwater** and one sample each year for **surface water systems**).

### Trigger for Increased Sampling

The maximum contaminant level (MCL) for each inorganic chemical triggers the requirement for increased sampling (see side bar text for list of contaminants and their corresponding MCLs).

Regulated Contaminants	
Contaminant	MCL (mg/L)
Barium	2
Cadmium	0.005
Chromium	0.1
Mercury	0.002
Selenium	0.05

---

### Increased Sampling

- 1) Any system exceeding the MCL for a given contaminant must take quarterly samples (in the quarter immediately following the violation) until a baseline is established (minimum of two quarters for *groundwater systems* and four quarters for *surface water systems*).
- 2) If the state determines that the baseline is "reliably and consistently" below the MCL, the sampling frequency may be reduced to the base requirements.

---

### Confirmation Samples

States may require a confirmation sample for any sample that exceeds the MCL. These confirmation samples must be taken within two weeks from the same sampling point and as soon as possible after the initial sample. If a confirmation sample is used, compliance is based on the average of the result of the initial and confirmation samples.

---

### Compliance Determination

- 1) If a system samples more frequently than annual (i.e., quarterly), the system would be in violation if the running annual average at any sampling point exceeds the MCL.
- 2) If a system conducts sampling on an annual or less frequent basis, the system would be in violation if one sample (or the average of the initial and confirmation samples) at any point exceeds the MCL.

---

### Public Notice

Any system violating the National Primary Drinking Water Regulation (i.e., MCL, monitoring and reporting requirements, etc.) for one or more of the five inorganic chemicals must give public notice. For a MCL violation, systems must issue a public notice that includes the specific mandatory health effects language contained in the Phase II Rule. Systems must publish the notice in the newspaper within 14 days and deliver the notice to consumers within 45 days. For monitoring violations, systems must notify consumers through major newspapers within three months.

---

### Compositing

Composite samples are allowed at state discretion from no more than five sampling points. Compositing of samples must be completed in a certified drinking water laboratory.

- 1) For systems serving greater than ( $>$ ) 3300 persons, compositing is only allowed at sampling points within a single system.
- 2) For systems serving less than ( $\leq$ ) 3300 persons, compositing among different systems is permitted.

---

### Waivers

States may grant "waivers by rule" to systems that are effective up to nine years (or one compliance cycle) for each of the five inorganic contaminants. In order to qualify for a waiver, a system must have three previous compliance

---

samples (including one taken after January 1, 1990), and all previous analytical results must be below the MCL (see grandfathering section above). The waiver must be granted at the beginning of the year in which the system is scheduled to sample, otherwise the system is subject to base sampling requirements. As a condition of the waiver, systems must take at least one sample during the nine-year waiver period.

The state must consider a variety of issues in making the "waiver by rule" determination, such as:

- 1) reported concentrations from all previous monitoring,
- 2) degree of variation in reported concentrations, and
- 3) other factors which may affect contaminant concentrations (i.e., ground-water pumping rates, changes in the system's configuration, changes in the system's operating procedures, or changes in stream flows or characteristics).

# Standardized Monitoring Framework: Inorganics (CWS and NTWS)

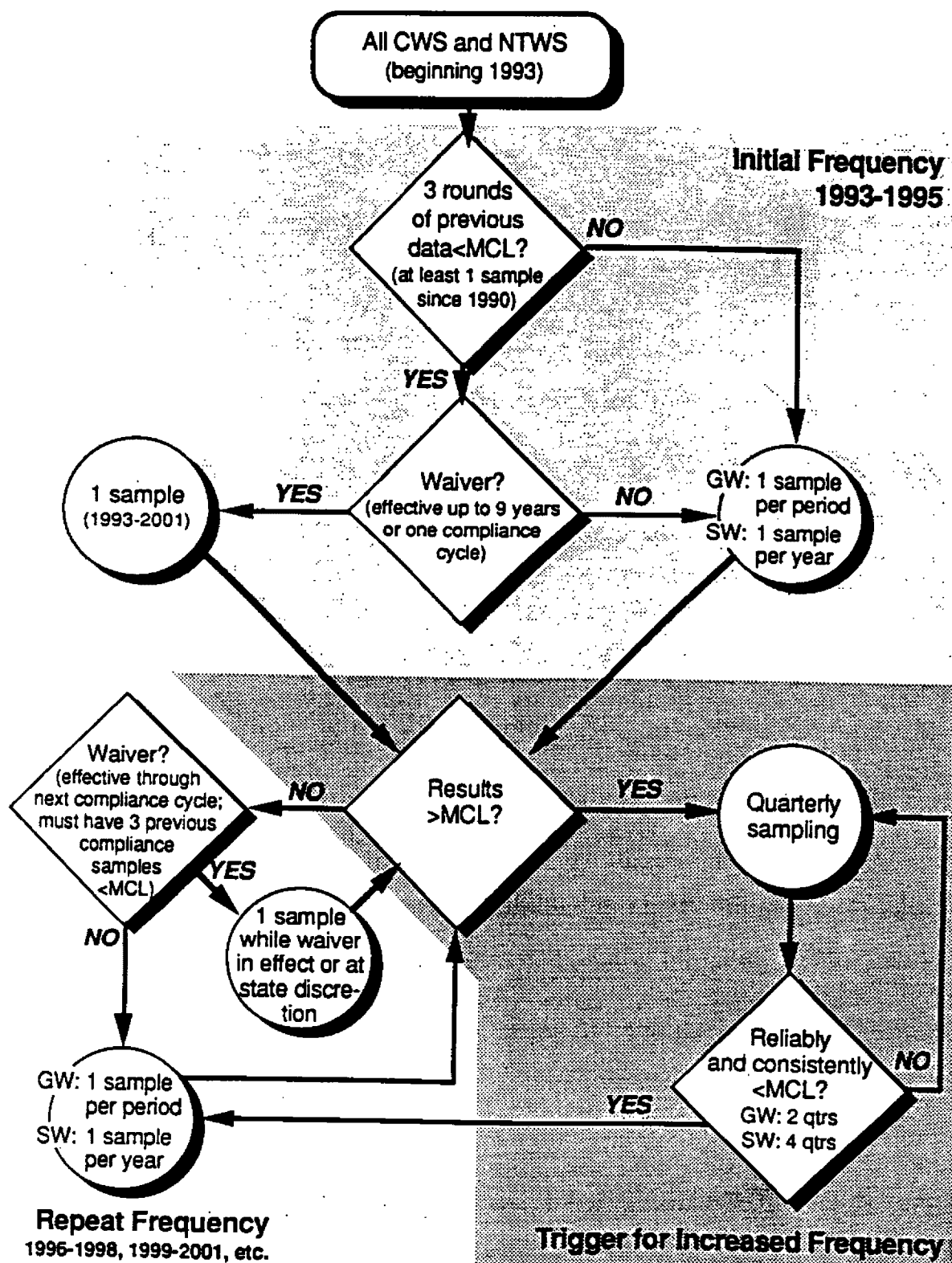
	CALENDAR YEAR		BASE REQUIREMENTS		WAIVERS (ALL SYSTEMS)
			SW	GW	
	1991				State may waive the base sampling requirements provided 3 previous samples are less than the MCL
	1992				
First 9 - year Compliance Cycle	1993	Initial Monitoring Round	1 sample at each sampling point	1 sample at each sampling point	1 sample at each sampling point
	1994		1 sample at each sampling point		
	1995		1 sample at each sampling point		
	1996	Repeat Monitoring	1 sample at each sampling point	1 sample at each sampling point	
	1997		1 sample at each sampling point		
	1998		1 sample at each sampling point		
	1999	Repeat Monitoring	1 sample at each sampling point	1 sample at each sampling point	
	2000		1 sample at each sampling point		
	2001		1 sample at each sampling point		
Begins Second 9 - year Cycle	2002	Repeat Monitoring Round	1 sample at each sampling point	1 sample at each sampling point	State may waive the base sampling requirements provided 3 previous samples are less than the MCL
	2003		1 sample at each sampling point		
	2004		1 sample at each sampling point		

## NOTES

- States will designate the year during each compliance period in which each system must sample.
- EPA is requiring states to schedule one-third of their systems for sampling in 1993, another one-third in 1994, and the final one-third in 1995.



# Inorganics Monitoring Flow Chart





2

3



# Volatile Organic Chemicals

## EPA Phase II Fact Sheet Series (6 of 14)

July 1991

*This fact sheet summarizes the monitoring requirements for 10 volatile organic chemicals (VOCs) as promulgated under the U.S. Environmental Protection Agency's (EPA) Phase II Rule. These requirements also apply to the eight VOCs contained under EPA's Phase I Rule. Monitoring for the 18 VOCs in accordance with the Standardized Monitoring Framework encompassed in the Phase II Rule begins in January 1993.*

### Systems Affected

All community water systems (CWS) and nontransient, noncommunity water systems (NTWS) must comply with the monitoring requirements for volatile organic chemicals.

### Sampling Points

Sampling must be conducted at each entry point to the distribution system. Sampling points must be representative of the well or source water after treatment.

### Initial Base Sampling

Between 1993 and 1995, all systems must take four consecutive quarterly samples for each of the new contaminants unless 1) a waiver has been granted by the state (see waiver requirements below) or 2) the system has previous sampling data enabling it to qualify for reduced sampling (see grandfathering section below). The state will designate the year in which each system samples within this compliance period.

### Grandfathering

States may allow sampling data collected after January 1, 1988 to satisfy the initial requirements. If the initial samples for the new organics are completed by December 31, 1992 and the system did not detect any of the organics, then the system need only take one sample annually beginning January 1, 1993.

### Trigger for Increased/Decreased Sampling

The method detection limit (MDL) is the trigger for increased/decreased sampling for each of the volatile organics. [See side bar for a list of contaminants and their corresponding maximum contaminant levels (MCLs) and MDLs].

Regulated Contaminants	
Eight Original VOCs	MCL (mg/L)
Benzene	0.005
Carbon tetrachloride	0.005
1,2-Dichloroethane	0.005
1,1-Dichloroethylene	0.007
para-Dichlorobenzene	0.075
1,1,1-Trichloroethane	0.20
Trichloroethylene	0.005
Vinyl chloride	0.002
Ten New VOCs	MCL (mg/L)
cis-1,2-Dichloroethylene	0.07
1,2-Dichloropropane	0.005
Ethylbenzene	0.7
Monochlorobenzene	0.1
o-Dichlorobenzene	0.6
Styrene	0.1
Tetrachloroethylene	0.005
Toluene	1
Trans-1,2-Dichloroethylene	0.1
Xylenes (total)	10
NOTE: The method detection limit (MDL) for all 18 volatile organics is 0.0005 mg/L.	

---

### Repeat Base Sampling (no detects)

Systems would continue taking four consecutive quarterly samples during subsequent three-year compliance periods. However, if contaminants are not detected during the initial round of sampling, states may allow systems to decrease their sampling frequency beginning in the 1996 compliance period as follows:

- 1) *Groundwater systems* must take at least one sample annually. After three years of annual sampling and no previous detection, *groundwater systems* can further reduce their sampling frequency to one sample per compliance period.
- 2) *Surface water systems* must sample annually.

---

### Increased Sampling (If detected or MCL exceeded)

If contaminants are detected at or above the MDL or if the MCL is exceeded, then systems must sample quarterly beginning in the next quarter.

- 1) Systems remain on quarterly sampling until a baseline is established (minimum of two quarters for *groundwater systems* and four quarters for *surface water systems*).
- 2) If the baseline indicates a system is "reliably and consistently" below the MCL, the state may reduce the system's sampling frequency to annual. (Annual sampling must be conducted during the quarter which previously yielded the highest analytical result.)
- 3) Systems which have three consecutive annual samples with no detection may apply to the state for a waiver (see waiver requirements below).
- 4) If any detection exceeds the MCL, both *groundwater* and *surface water systems* must take four consecutive quarterly samples until a reliable baseline is established.

---

### Confirmation Samples

States may require a confirmation sample for positive or negative results. If taken, the compliance determination must be based on the average of the results of the initial and confirmation samples.

---

### Compliance Determination

- 1) If a system samples more frequently than annually (quarterly or semi-annually), the system is in violation if the running annual average at any sampling point exceeds the MCL.
- 2) If a system samples on an annual or less frequent basis (i.e., one sample per compliance period), the system is in violation if one sample (or the average of the original and confirmation samples) at any point exceeds the MCL.

---

### Public Notice

Any system violating any National Primary Drinking Water Regulation (MCL monitoring and reporting requirements, etc.) for one or more of the VOCs must give public notice. For a MCL violation, systems must issue a public notice that includes the specific mandatory health effects language contained in the Phase II Rule. Systems must publish the notice in the newspaper within 14

days and deliver the notice to consumers within 45 days. For monitoring violations, systems must notify consumers through major newspapers within three months.

### Compositing

Composite samples are allowed at state discretion from no more than five sampling points. Compositing of samples must be completed in a certified drinking water laboratory.

- 1) For systems serving greater than ( $>$ ) 3300 persons, compositing is only allowed at sampling points within a single system.
- 2) For systems serving less than ( $\leq$ ) 3300 persons, compositing among different systems is permitted.

### Waivers

Systems can apply to the state for a waiver from initial and repeat base sampling frequencies. Systems are eligible for both "use" and "susceptibility" waivers provided the system has conducted a vulnerability assessment. Systems are eligible for waivers beginning in the compliance period 1993 to 1995. Waivers are effective for one compliance period; they must be renewed in subsequent compliance periods or the system must conduct sampling that is commensurate with base requirements.

#### Use Waivers

When a system, on the basis of a vulnerability assessment, can demonstrate that volatile organics were not used previously in the water supply area (i.e., the contaminant was not used, manufactured, stored or disposed), the system can apply to the state for a "use" waiver. Systems ineligible for a "use" waiver can apply for a waiver based on "susceptibility."

#### Susceptibility Waivers

"Susceptibility" waivers are contingent on the conduct of a thorough vulnerability assessment which considers prior analytical and/or vulnerability assessment results (including those of surrounding systems), environmental persistence and transport, how well the source is protected, Wellhead Protection Assessments, and proximity to sources of contamination. If a waiver is granted based on susceptibility, sampling requirements are eliminated for the compliance period in which the waiver was granted.

#### Sampling Frequency with Waivers

*Groundwater systems* that have been granted a waiver are required to sample once every six years and must update the vulnerability assessment at the midpoint or three year mark of the six-year period. *Surface water systems* with a waiver are required to sample only at the discretion of the state.

# Standardized Monitoring Framework: Volatile Organic Chemicals (CWS and NTWS)

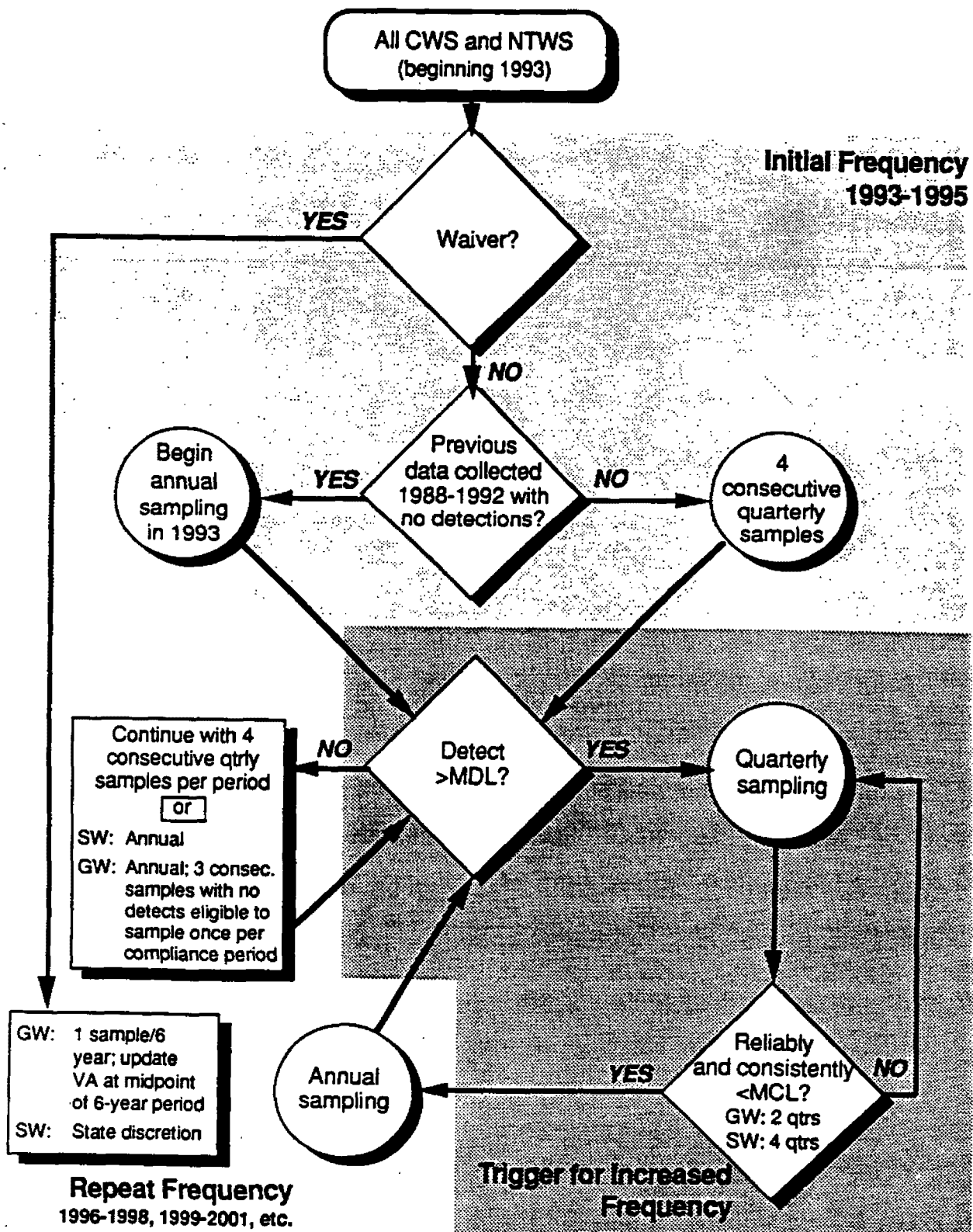
	CALENDAR YEAR		BASE REQUIREMENTS	REDUCED MONITORING <sup>1</sup>		WAIVERS <sup>1</sup> (Based on VA)	
			ALL SYSTEMS	ALL SYSTEMS	GW SYSTEMS	SW	GW
	1991						
	1992						
First 9 - year Compliance Cycle	1993	Initial Monitoring Round	4 quarterly samples at each sampling point	1 sample at each sampling point.	1 sample at each sampling point.	State discretion	1 sample
	1994			"	"		
	1995			"	"		
	1996	Repeat Monitoring	4 quarterly samples at each sampling point	"	1 sample <sup>2</sup>	State discretion	1 sample
	1997			"			
	1998			"			
	1999	Repeat Monitoring	4 quarterly samples at each sampling point	"	1 sample	State discretion	1 sample
	2000			"			
	2001			"			
Begins Second 9 - year Cycle	2002	Repeat Monitoring Round	4 quarterly samples at each sampling point	"	1 sample	State discretion	1 sample
	2003			"			
	2004			"			

Footnotes 1 Provided initial sampling completed by 12/31/92 and the system did not detect contaminants.  
2 Reduction allowed after no detection of contaminants in three years of annual sampling data.

## NOTES

- States will designate the year during each compliance period in which each system must sample.
- EPA is requiring states to schedule one-third of their systems for sampling in 1993, another one-third in 1994, and the final one-third in 1995.

# Volatile Organic Chemicals Monitoring Flow Chart





7

3





---

# Pesticides

## EPA Phase II Fact Sheet Series (7 of 14)

July 1991

*This fact sheet summarizes the monitoring requirements for 17 pesticides (12 new and five revised) and polychlorinated biphenyls (PCBs) as promulgated under the U.S. Environmental Protection Agency's (EPA) Phase II Rule. Monitoring for the pesticides and PCBs begins in January 1993.*

---

### Systems Affected

All community water systems (CWS) and nontransient, noncommunity water systems (NTWS) must comply with the monitoring requirements for pesticides and PCBs.

---

### Sampling Points

Sampling must be conducted at each entry point to the distribution system. Sampling points must be representative of the well or source water after treatment.

---

### Initial Base Sampling

Between 1993 and 1995, all systems must take an initial round of four consecutive quarterly samples unless a waiver has been granted by the state (see below for summary of waiver requirements). The state will designate the year in which each system samples within this compliance period.

---

### Grandfathering

States may allow sampling data collected after January 1, 1990 to satisfy the initial base sampling requirements.

---

### Trigger for Increased/Decreased Sampling

The method detection limit (MDL) is the trigger for increased/decreased sampling for each pesticide or PCB [see table on following page for a list of contaminants and their corresponding maximum contaminant levels (MCLs) and MDLs].

---

### Repeat Base Sampling (no detects)

Systems would continue taking four consecutive quarterly samples during subsequent three-year compliance periods. However, if contaminants are not detected during the initial round of sampling, states may allow systems to decrease their sampling frequency beginning in the 1996 compliance period as follows:

- 1) Systems that serve greater than (>) 3300 persons may reduce their sampling frequencies to two samples in one year per compliance period.

- 2) Systems that serve less than ( $\leq$ ) 3300 persons may reduce their sampling frequencies to one sample in each compliance period.

Regulated Contaminants		
Contaminant	MCL <sup>1</sup> (m/L)	MDL <sup>2</sup> (mg/L)
Alachlor	0.002	0.0002
Aldicarb	0.003*	0.0005
Aldicarb sulfoxide	0.003*	0.0005
Aldicarb sulfone	0.003*	0.0008
Atrazine	0.003	0.0001
Carbofuran	0.04	0.0009
Chlordane	0.002	0.0002
Dibromochloropropane (DPCP)	0.0002	0.00002
2,4-D	0.07	0.0001
Ethylene dibromide (EDB)	0.00005	0.00001
Heptachlor	0.0004	0.00004
Heptachlor epoxide	0.0002	0.00002
Lindane	0.0002	0.00002
Methoxychlor	0.04	0.0001
Polychlorinated biphenyls (PCBs)	0.0005	0.0001
Pentachlorophenol	0.001*	0.00004
Toxaphene	0.003	0.001
2,4,5-TP (Silvex)	0.05	0.0002

<sup>1</sup>MCL=Maximum Contaminant Level

<sup>2</sup>MDL=Method Detection Limit

MCLs for aldicarb, aldicarb sulfoxide, aldicarb sulfone and pentachlorophenol were promulgated July 1, 1991 and will take effect January 1, 1993. The MCLs for the other contaminants were revised or promulgated January 30, 1991 and will take effect July 30, 1992.

#### Increased Sampling (if detected or MCL exceeded)

If contaminants are detected or if the MCL is exceeded in any sample, then systems must sample quarterly beginning in the next quarter. Systems are to sample quarterly until a baseline is established (minimum of two quarters for *groundwater systems* and four quarters for *surface water systems*).

- 1) If the baseline indicates a system is "reliably and consistently" below the MCL, the state may reduce the system's sampling frequency to annual. (Annual sampling must be conducted during the quarter which previously yielded the highest analytical result.)
- 2) Systems which have three consecutive annual samples with no detection can apply to the state for a waiver.

#### Confirmation Samples

States may require a confirmation sample for positive or negative results. If a confirmation sample is used, the compliance determination is based on the average of the results of the initial and confirmation samples.

#### Compliance Determination

- 1) If a system samples more frequently than annual (i.e., quarterly or semi-annually), the system is in violation if the running annual average at any sampling point exceeds the MCL.

- 2) If a system conducts sampling on an annual or less frequent basis (i.e., one sample per compliance period), the system is in violation if one sample (or the average of the initial and confirmation samples) at any point exceeds the MCL.

---

### Public Notice

Any system violating a National Primary Drinking Water Regulation (i.e., MCL, monitoring and reporting requirements, etc.) for one or more of the 17 pesticides and PCBs must give public notice. For a MCL violation, systems must issue a public notice that includes the specific mandatory health effects language contained in the Phase II Rule. Systems must publish the notice in the newspaper within 14 days and deliver the notice to consumers within 45 days. For monitoring violations, systems must notify consumers through major newspapers within three months.

---

### Compositing

Composite samples are allowed at state discretion from no more than five sampling points. Compositing of samples must be completed in a certified drinking water laboratory.

- 1) For systems serving greater than (>) 3300 persons, compositing is only allowed at sampling points within a single system.
- 2) For systems serving less than ( $\leq$ ) 3300 persons, compositing among different systems is permitted.

---

### Waivers

Systems can apply to the state for a waiver from initial and repeat base sampling frequencies. Systems are eligible for both "use" and "susceptibility" waivers provided the system has conducted a vulnerability assessment. Systems are eligible for waivers beginning in the initial compliance period, 1993 to 1995. Waivers are effective for one compliance period; they must be renewed in subsequent compliance periods or the system must conduct sampling that is commensurate with base requirements. Systems receiving a waiver are not required to sample.

---

### Use Waivers

When a system, on the basis of a vulnerability assessment, demonstrates that the regulated pesticide/PCB has not been used in the water supply area (i.e., the contaminant was not used, manufactured, stored or disposed of in the area), the system can apply to the state for a "use" waiver. Systems not eligible for "use" waivers may still qualify for a waiver by evaluating susceptibility (see below).

---

### Susceptibility Waivers

"Susceptibility" waivers are contingent on the conduct of a thorough vulnerability assessment. Such a vulnerability assessment must consider prior analytical and/or vulnerability assessment results (including those of surrounding systems), environmental persistence and transport, how well the source is protected, Wellhead Protection Assessments, and proximity of the supply to sources of contamination.

# Standardized Monitoring Framework: Pesticides (CWS and NTWS)

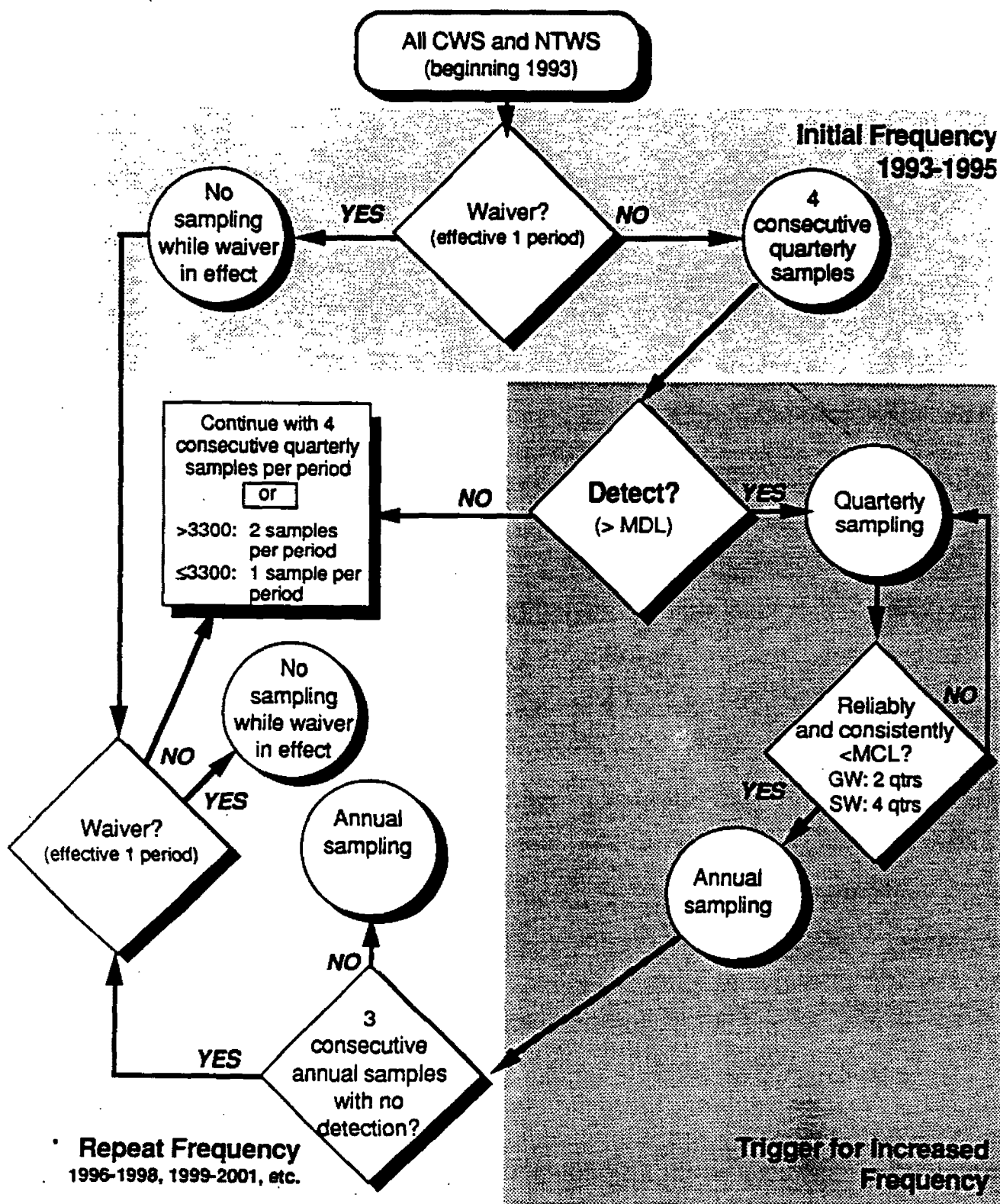
	CALENDAR YEAR		BASE REQUIREMENTS: ALL SYSTEMS	REDUCED MONITORING: SYSTEMS WITH NO PREVIOUS DETECTION	WAIVERS *
	1991				
	1992				
First 9 - year Compliance Cycle	1993	Initial Monitoring Round	4 quarterly samples at each sampling point	Not Applicable	Waiver
	1994				
	1995				
	1996	Repeat Monitoring	4 quarterly samples at each sampling point	Systems Serving: > 3,300 - 2 samples at each sampling point ≤ 3,300 - 1 sample at each sampling point	Waiver
	1997				
	1998				
	1999	Repeat Monitoring	4 quarterly samples at each sampling point	Systems Serving: > 3,300 - 2 samples at each sampling point ≤ 3,300 - 1 sample at each sampling point	Waiver
	2000				
	2001				
Begins Second 9 - year Cycle	2002	Repeat Monitoring Round	4 quarterly samples at each sampling point	Systems Serving: > 3,300 - 2 samples at each sampling point ≤ 3,300 - 1 sample at each sampling point	Waiver
	2003				
	2004				

## NOTES

- States will designate the year during each compliance period in which each system must sample.
- EPA is requiring states to schedule one-third of their systems for sampling in 1993, another one-third in 1994, and the final one-third in 1995.

\* Based on "use" and/or "susceptibility" assessment (No Samples Required)

# Pesticides Monitoring Flow Chart





5

2



# Unregulated Contaminants

## EPA Phase II Fact Sheet Series (8 of 14)

July 1991

*This fact sheet summarizes the one-time monitoring requirements for 24 organic and six inorganic chemicals as promulgated under the U.S. Environmental Protection Agency's (EPA) Phase II Rule. Monitoring for these contaminants begins in January 1993.*

### Unregulated Contaminants

#### Organics

Aldrin  
Benzo(a)pyrene  
Butachlor  
Carbaryl  
Dalapon  
Di(2-ethylhexyl)adipate  
Di(2ethylhexyl)phthalates  
Dicamba  
Dieldrin  
Dinoseb  
Diquat  
Endothall  
Glyphosate  
Hexachlorobenzene  
Hexachlorocyclopentadiene  
3-Hydroxycarbofuran  
Methomyl  
Metolachlor  
Metribuzin  
Oxamyl (vydate)  
Picloram  
Propachlor  
Simazine  
2,3,7,8-TCDD (Dioxin)

#### Inorganics

Antimony  
Beryllium  
Nickel  
Sulfate  
Thallium  
Cyanide

### Systems Affected

All community water systems (CWS) and nontransient, noncommunity water systems (NTWS) must conduct monitoring for the 24 organic and six inorganic chemicals (see side bar for lists of contaminants).

### Sampling Points

Sampling must be conducted at each entry point to the distribution system. Sampling points must be representative of the well or source water after treatment.

### Sampling Requirements

All systems must conduct a one-time round of sampling, unless a waiver has been granted by the state (see below for summary of waiver requirements). The specific sampling requirements are:

- 1) For the 24 organic chemicals, systems must take four consecutive quarterly samples and report the results to the state.
- 2) For the six inorganic chemicals, systems must take one sample and report the results to the state.
- 3) Sampling must be completed no later than December 31, 1995.

### Confirmation Samples

The state may require a confirmation sample for positive or negative results.

### Compositing

Composite samples are allowed at state discretion from no more than five sampling points. Compositing of samples must be completed in a certified drinking water laboratory.

- 1) For systems serving greater than ( $>$ ) 3300 persons, compositing is only allowed at sampling points within a single system.
- 2) For systems serving less than ( $\leq$ ) 3300 persons, compositing among different systems is permitted.

---

### **Waivers**

Systems may apply to the state for a waiver from the sampling requirements. Such waivers may be granted for either the organics or inorganics, or both, as follows:

- 1) **Waiver for Organics:** When a system can rule out previous use of the chemical in the water supply area (i.e., the contaminant was not used, manufactured, stored or disposed of in the area), the system can apply to the state for a "use" waiver. If previous use is unknown, then systems may still qualify for a waiver by evaluating susceptibility. "Susceptibility" waivers are contingent on the conduct of a thorough vulnerability assessment. The state may grant a "susceptibility" waiver based on an evaluation of prior analytical and/or vulnerability assessment results (including those of surrounding systems), environmental persistence and transport, how well the source is protected, Wellhead Protection Assessments, and proximity to sources of contamination.
- 2) **Waiver for Inorganics:** The state may grant a waiver if previous analytical results indicate contamination would not occur, provided this data was collected after January 1, 1990.
- 3) **Waiver for Very Small Systems:** Systems serving fewer than 150 service connections may obtain a waiver by sending a letter to the state indicating that the system is available for sampling. This letter must be sent to the state by January 1, 1994.



# Standardized Monitoring Framework: Unregulated Contaminants (CWS and NTM)

	CALENDAR YEAR		BASE REQUIREMENTS: ALL SYSTEMS		WAIVERS *
			Organics	Inorganics	
	1991				
	1992				
First 9 - year Compliance Cycle	1993	Initial Monitoring Round	4 quarterly samples at each sampling point	1 sample at each sampling point	Waiver
	1994				
	1995				
	1996	Repeat Monitoring			
	1997				
	1998				
	1999	Repeat Monitoring			
	2000				
	2001				
Begins Second 9 - year Cycle	2002	Repeat Monitoring Round			
	2003				
	2004				

NOTES • States will designate the year during each compliance period in which each system must sample.  
• EPA is requiring states to schedule one-third of their systems for sampling in 1993, another one-third in 1994, and the final one-third in 1995.

\* Based on "use" and/or "susceptibility" assessment (No Samples Required)



# Analytical Methods

## EPA Phase II Fact Sheet Series (9 of 14)

July 1991

*This fact sheet summarizes the analytical requirements for 38 synthetic organic and inorganic chemicals as promulgated under the U.S. Environmental Protection Agency's (EPA) Phase II Rule.*

### Laboratory Certification

Analyses of monitoring samples for compliance purposes may only be conducted by laboratories which have been certified by the state or EPA.

To receive approval for inorganic chemical (IOC) analyses, a laboratory must:

- Analyze a set of IOC performance evaluation (PE) samples supplied by EPA or the state using the methods listed in Table 1;
- Achieve acceptance limits (ALs) established for each inorganic contaminant as listed in Table 1; and
- Pass an on-site inspection.

To receive certification for volatile organic chemical (VOC) analyses, a laboratory must:

- Analyze a set of VOC PE samples supplied by EPA or the state using the methods listed in Table 2;
- Achieve a  $\pm 20$  percent AL on 80 percent of all Phase I and Phase II VOCs, except vinyl chloride, when the actual amount is  $\geq 0.010$  mg/L;
- Achieve a  $\pm 40$  percent AL on 80 percent of all Phase I and Phase II VOCs, except vinyl chloride, when the actual amount is  $< 0.010$  mg/L;
- Achieve a method detection limit (MDL) of 0.0005 mg/L;
- Be currently approved by EPA or the state for the analyses of trihalomethanes; and
- Pass an on-site inspection.

To receive certification for synthetic organic chemicals (SOC) analyses [i.e., pesticides and polychlorinated biphenyls (PCBs)], a laboratory must:

- Analyze a set of SOC performance samples supplied by EPA or the state using the methods listed in Table 3;
- Achieve ALs as listed in Table 3 for each substance;
- Achieve MDLs for each substance as listed in Table 3; and
- Pass an on-site inspection.

## State Laboratory Program Requirements

As part of their primary enforcement responsibilities, states must:

- assure the availability of sufficient qualified lab facilities to meet the state's analytical needs;
- establish and maintain a certification program for laboratories, except where all analyses are conducted by state laboratories; and
- designate official(s) to be responsible for this program.

## Cost-Effective Analytical Strategies

To minimize analytical costs, labs may select an approved analytical method which measures the greatest number of contaminants for which a system is vulnerable. For example, EPA Method 505 can be used to measure alachlor, atrazine, chlordane, heptachlor, heptachlor epoxide, lindane, methoxychlor, and toxaphene. Method 505 can also be used as a screen for PCBs.

(Note: Additional information on VOC analysis is available in *How to Convert From THM to VOC Purge and Trap Gas Chromatographic Analysis*. EPA 570 9-88-011. Available from the Safe Drinking Water Hotline, 1-800-426-4791.)

## Sample Compositing

Composite samples from a maximum of five sampling points are allowed, but compositing must be conducted in a certified laboratory. VOC and SOC composite samples must be analyzed within 14 days of collection.

## Sample Preservation

Preservation requirements for inorganic and organic samples are specified in the following two tables:

Inorganic Sample Preservation			
Contaminant	Preservative	Container*	Time
Asbestos	Cool, 4° C	P or G	
Barium	Conc. $\text{HNO}_3$ to $\text{pH} < 2$	P or G	6 Months
Cadmium	Conc. $\text{HNO}_3$ to $\text{pH} < 2$	P or G	6 Months
Chromium	Conc. $\text{HNO}_3$ to $\text{pH} < 2$	P or G	6 Months
Fluoride	None	P or G	1 Month
Mercury	Conc. $\text{HNO}_3$ to $\text{pH} < 2$	P or G	28 Days
Nitrate:			
Chlorinated	Cool, 4° C	P or G	28 Days
Non-chlorinated	Conc. $\text{H}_2\text{SO}_4$ to $\text{pH} < 2$	P or G	14 Days
Nitrite	Cool, 4° C	P or G	48 Hours
Selenium	Conc. $\text{HNO}_3$ to $\text{pH} < 2$	P or G	6 Months

\* P = Plastic; G = Glass

# Organic Sample Preservation

Chemical	Method	Preservative*	Container Size (all are glass)	Sample Hold Time and Temperature
VOCs	All VOC Methods	Ascorbic Acid or Sodium Thiosulfate, acidify with HCL	40 to 120 mL vials with PFTE septa	14 d, 4°C
Alachlor	505 507 525.1	Thiosulfate Thiosulfate and HgCl HCl and Sodium Sulfite	40 mL bottle 1 L bottle 1 L or 1 qt. bottle	14 d, 4°C 14 d, 4°C, dark 7 d, 4°C
Aldicarb	531.1	Thiosulfate & pH 3	60 mL vial/PFTE	28 d, -10°C
Aldicarb sulfone	531.1	Thiosulfate & pH 3	60 mL vial/PFTE	28 d, -10°C
Aldicarb sulfoxide	531.1	Thiosulfate & pH 3	60 mL vial/PFTE	28 d, -10°C
Atrazine	505 507 525.1	Thiosulfate Thiosulfate and HgCl HCl and Sodium Sulfite	40 mL bottle 1 L bottle 1 L or 1 qt. bottle	14 d, 4°C 14 d, 4°C, dark 7 d, 4°C
Carbofuran	531.1	Thiosulfate & pH 3	60 mL vial/PFTE	28 d, -10°C
Chlordane	505 508 525.1	Thiosulfate Thiosulfate and HgCl HCl and Sodium Sulfite	40 mL bottle 1 L bottle 1 L or 1 qt. bottle	14 d, 4°C 7 d, 4°C 7 d, 4°C
Dibromochloro- propane	504	Thiosulfate & HCl	40 mL bottles	28 d, 4°C
Ethylene dibromide	504	Thiosulfate & HCl	40 mL bottles	28 d, 4°C
Heptachlor	505 508 525.1	Thiosulfate Thiosulfate and HgCl HCl and Sodium Sulfite	40 mL bottle 1 L bottle 1 L or 1 qt. bottle	7 d, 4°C 7 d, 4°C 7 d, 4°C
Heptachlor epoxide	505 508 525.1	Thiosulfate Thiosulfate and HgCl HCl and Sodium Sulfite	40 mL bottle 1 L bottle 1 L or 1 qt. bottle	14 d, 4°C 7 d, 4°C 7 d, 4°C
Lindane	505 508 525.1	Thiosulfate Thiosulfate and HgCl HCl and Sodium Sulfite	40 mL bottle 1 L bottle 1 L or 1 qt. bottle	14 d, 4°C 7 d, 4°C 7 d, 4°C
Methoxychlor	505 508 525.1	Thiosulfate Thiosulfate and HgCl HCl and Sodium Sulfite	40 mL bottle 1 L bottle 1 L or 1 qt. bottle	14 d, 4°C 7 d, 4°C 7 d, 4°C
Pentachloro- phenol	515.1 525.1	Thiosulfate and HgCl HCl and Sodium Sulfite	1 L bottle 1 L or 1 qt. bottle	7 d, 4°C 7 d, 4°C
PCB (screen)	505 508	Thiosulfate Thiosulfate and HgCl	40 mL bottle 1 L bottle	14 d, 4°C 7 d, 4°C
PCB (aroclor)	508A	No Chemicals	1 L bottle	14 d, 4°C
Toxaphene	505 508 525.1	Thiosulfate Thiosulfate and HgCl HCl and Sodium Sulfite	40 mL bottle 1 L bottle 1 L or 1 qt. bottle	14 d, 4°C 7 d, 4°C 7 d, 4°C
2,4-D	515.1	Thiosulfate and HgCl	1 L bottle	14 d, 4°C
2,4,5-TP (Silvex)	515.1	Thiosulfate and HgCl	1 L bottle	14 d, 4°C

\* If sample contains residual chlorine, reduce with thiosulfate.

### **Special Privacy Requirements (§142.16)**

1. A plan for the initial monitoring period which schedules systems for monitoring according to the availability of certified laboratories in each of the three years. This plan must be enforceable under state law.
2. IF a state chooses to issue monitoring waivers for regulated and unregulated contaminants (see Optional Provisions below), the state must describe:
  - a. Procedures for making waiver decisions, specifically:
    - Waiver application requirements.
    - Process for determining "use" and "susceptibility" waivers.
    - Factors to be considered in granting or denying waivers.
  - b. Monitoring data and other documentation to be used in making vulnerability determinations.

### **Optional Provisions**

To increase their flexibility in implementing Phase II, states may adopt the following provisions at their discretion:

**Waivers** — The state decides whether to grant waivers from the monitoring requirements of Phase II.

**Vulnerability Assessments** — If the state allows monitoring waivers, the state has discretion to establish its own criteria for approval of vulnerability assessments performed by a water system.