United States Environmental Protection Agency | Office of Water 4606 | EPA 815-D-06-009 December 2006 DRAFT

THE ANALYSIS OF OCCURRENCE DATA FROM THE UNREGULATED CONTAMINANT MONITORING (UCM) PROGRAM AND NATIONAL INORGANICS AND RADIONUCLIDES SURVEY (NIRS) IN SUPPORT OF REGULATORY DETERMINATIONS FOR THE SECOND DRINKING WATER CONTAMINANT CANDIDATE LIST

Printed on Recycled Paper

Disclaimer

This document is designed to provide technical background information for the regulatory determinations being considered by the Office of Ground Water and Drinking Water.

This document is not a regulation itself, and it does not substitute for the Safe Drinking Water Act (SDWA) or the Environmental Protection Agency's (EPA's) regulations. Mention of trade names or commercial products does not constitute endorsement or recommendation for use.

Acknowledgments

The compilation and analysis of data presented in this report were undertaken by EPA's Office of Ground Water and Drinking Water (OGWDW) in support of their determinations regarding whether regulating specific CCL 2 drinking water contaminants will present a meaningful opportunity to reduce health risk. This effort was directed by Mr. Clifton Townsend and Ms. Wynne Miller of OGWDW's Standards and Risk Management Division (SRMD) Targeting and Analysis Branch (TAB). Wynne Miller served as the Team Lead for the CCL 2 Preliminary Regulatory Determinations under the guidance of Ann Codrington (TAB Associate Branch Chief until December 2005), Eric Burneson (TAB Branch Chief), Phil Oshida (SRMD Deputy Division Director), Pamela Barr (SRMD Division Director) and Cynthia Dougherty (OGWDW Office Director).

We would like to thank the many States, as well as the American Water Works Service Company, that contributed data sets and valuable advice. Thanks also to the many public water systems that conducted the monitoring that provided the contaminant occurrence data used in this report.

The Cadmus Group, Inc., served as the prime contractor for this project, supporting the data management, analysis, and report development under Contract # 68-C-02-026. The major contributions of Morgan Tingley, Erin Mateo, Alison Cullity, Brent Ranalli, and Dr. George Hallberg are gratefully acknowledged. Dr. Jonathan Koplos served as the Cadmus Project Manager.

Executive Summary

The Unregulated Contaminant Monitoring (UCM) program (Rounds 1 and 2) and the National Inorganics and Radionuclides Survey (NIRS) were important sources of data considered by the United States Environmental Protection Agency (EPA) when evaluating the occurrence of unregulated contaminants on the second Contaminant Candidate List (CCL 2). This report presents EPA's analysis of national occurrence of CCL 2 contaminants with data from those sources. Detailed occurrence analyses are presented in this report to support the EPA Regulatory Determinations for the four CCL 2 contaminants with Round 1, Round 2 and NIRS data: boron, metolachlor, 1,3-dichloropropene, and 1,1,2,2-tetrachloroethane. Detailed descriptions are presented of the data sources, data editing and management, development of national cross-sections using UCM Round 1 and Round 2 data from States, and the analytical approaches used to assess the occurrence data.

The UCM Round 1 monitoring data represent public water system (PWS) monitoring results from 1988 to 1992 for unregulated contaminants collected under the authority of Safe Drinking Water Act (SDWA). Forty States/primacy entities have submitted PWS monitoring data for Round 1. Subsequent UCM Round 2 monitoring data collected from 1993 to 1997 were reported by 35 States/entities. The raw data from these two databases were reviewed and edited for data quality considerations to ensure consistency and repeatability in the analyses. A data management approach was developed to construct representative national cross-sections using the State data sets determined to be of the highest quality and most complete.

The development of the UCM Round 1 and Round 2 national cross-sections enabled occurrence analyses that were indicative of national occurrence using data from these two large databases. All States with monitoring data were first evaluated by their distribution across a range of pollution potential indicators and spatial/hydrogeologic diversity. A select group of States, representing a balanced distribution across these pollution potential measures and across the nation geographically, was then used to construct national cross-sections (one using Round 1 data, the other Round 2 data) that would provide reasonable representations of national occurrence. While the Round 1 and Round 2 national cross-sections cannot be presented as "statistically representative," they comprise very large samples (24 and 20 States, respectively), provide analytical occurrence results that are clear indications of central tendency of the occurrence data, and are generally indicative of national contaminant occurrence.

The NIRS provides contaminant occurrence data from 1984 through 1986 from a group of statistically selected, nationally representative PWSs served by ground water. These data are from 49 States (there are no data from Hawaii), as well as Puerto Rico. Given the statistical design of NIRS, the resulting contaminant occurrence analyses can be considered representative of national occurrence in public water systems served by ground water.

Occurrence analyses of the UCM Rounds 1 and 2 and the NIRS data are conducted using a two-stage analytical approach. In Stage 1, the data are first reviewed, quality-checked and characterized, and then analyzed to generate simple, clear non-parametric estimates of contaminant occurrence. The Stage 1 analysis, based on maximum sample analytical values, is inherently conservative; it is careful not to underestimate occurrence toward the goal of protecting public health. Simple counts are made of the number of systems, and populations-

served by those systems, with at least one analytical result above a specified concentration threshold. Any contaminant found to have significant occurrence at or near health reference level (HRL) concentrations based on the Stage 1 analysis can additionally be analyzed using the Stage 2 analysis. In Stage 2, statistical modeling is used to generate national probability estimates of contaminant occurrence based on estimated annual mean concentrations of contaminants while providing statistical measures of uncertainty and error. Because no contaminants in this report were found with significant levels of contaminant occurrence at or near the HRLs of concern based on the Stage 1 analyses, the Stage 2 analyses were not warranted for any of the contaminants.

Stage 1 assessments of occurrence are presented in several ways for each contaminant to characterize different aspects of occurrence. For each contaminant, occurrence statistics presented include the number and percent of samples with laboratory analytical detections, which are quantified analytical values above the laboratory Method (or Minimum) Reporting Level (MRL). All analytical detections are summarized by calculating and presenting the minimum, median, and 99th percentile values of detections for each contaminant. At the system level, the number and percent of systems with at least one detection at or above the MRL, and the number and percent of systems with at least two detections at or above the MRL, are presented. For contaminants with HRLs, similar types of occurrence assessments are presented relative to the concentration values of the HRL. The occurrence of the four contaminants described in this report is summarized as follows:

- For boron, 989 total samples (1 sample per system) were collected by the NIRS. Boron was detected at or above the MRL of 0.005 mg/L in 810 (81.9% of) systems. The maximum detection was 3.95 mg/L and the median detection was 0.047 mg/L. Detections were found in PWSs in all States that conducted sampling, with the exception of Rhode Island. Seventeen PWSs had detections greater than the boron HRL of 1.4 mg/L, and 43 PWSs detected concentrations greater than ½ HRL (0.7 mg/L). A national extrapolation from the statistical sample of PWSs finds that 48,682 ground water systems, serving more than 75.5 million people, are estimated to have at least one sample detection of boron. Approximately 2,584 ground water systems, serving nearly 2.5 million people are estimated to have at least one sample detection of boron above the ½ HRL and approximately 1,022 ground water systems, serving approximately 372,000 people are estimated to have at least one sample detection of boron above the HRL of 1.4 mg/L.

- For metolachlor, a total of 33,930 samples were collected by the Round 2 cross-section. Metolachlor was detected at or above the MRL in 108 (0.83% of) systems. Although occurrence was relatively widespread, the metolachlor concentrations found were consistently low. In the Round 2 cross-section, the maximum detection was 13.8 µg/L, the 99th percentile of detections was 7.1 µg/L, and the median detection was 0.61 µg/L. Detections were found in PWSs in 12 of the 19 Round 2 cross-section States. The proportion of surface water systems with metolachlor detections (6.55%) was much greater than that for ground water systems (0.11%). A national extrapolation from the Round 2 cross-section results estimates that 542 systems, serving approximately 24.7 million people, have at least one sample detection of metolachlor. No analytical results

in the Round 2 database were greater than the metolachlor HRL of 70 µg/L. Metolachlor was not monitored under the UCM Round 1.

- For 1,3-dicloropropene, in the Round 1 national cross-section, a total of 31,104 samples were collected from 9,164 PWSs. 1,3-Dichloropropene was detected at or above the MRL in 15 (0.16% of) systems. The maximum detection in the Round 1 cross-section was 2.0 µg/L and the median detection was 1.0 µg/L. Detections were found in PWSs in 5 of the Round 1 cross-section States. A national extrapolation from the Round 1 cross-section results estimates 106 systems, serving approximately 1.8 million people, have at least one sample detection of 1,3-dichloropropene. All PWSs with detections of 1,3-dichlorpropane in Round 1 also had detections greater than the ½ HRL and HRL.

  For 1,3-dicloropropene, in the Round 2 national cross-section, a total of 70,631 samples were collected from 16,787 PWSs. 1,3-Dichloropropene was detected at or above the MRL in 58 (0.35% of) systems. The maximum detection in the Round 2 cross-section was 39 µg/L and the median detection was 0.5 µg/L. Detections were found in PWSs in 7 of the Round 2 cross-section States. Fifty PWSs had detections of 1,3-dichloropropene greater than ½ HRL and 38 PWSs had detections greater than HRL. All 7 Round 2 States had at least one PWS with a detection greater than the HRL. A national extrapolation from the Round 2 cross-section results estimates 225 systems, serving approximately 1.2 million people, have at least one sample detection of 1,3-dichloropropene. Approximately 194 systems, serving approximately 894,000 people are estimated to have at least one sample detection of 1,3-dichloropropene greater than the ½ HRL and approximately 147 systems, serving approximately 703,000 people are estimated to have at least one sample detection greater than the HRL.

- For 1,1,2,2-tetrachloroethane, in the Round 1 national cross-section, a total of 67,688 samples were collected from 20,407 PWSs. 1,1,2,2-Tetrachloroethane was detected at or above the MRL in 91 (0.45% of) systems. The maximum detection in the Round 1 cross-section was 200 µg/L and the median detection was 0.5 µg/L. Detections were found in PWSs in 13 of the Round 1 cross-section States. Forty-one PWSs had detections of 1,1,2,2-tetrachloroethane greater than the HRL of 0.4 µg/L and 44 PWSs had detections greater than the ½ HRL (0.2 µg/L.). 1,1,2,2-Tetrachloroethane detections greater than the HRL were found in PWSs in 9 of the Round 1 cross-section States. A national extrapolation from the Round 1 cross-section results estimates 290 systems, serving approximately 4.0 million people, have at least one sample detection of 1,1,2,2-tetrachloroethane. Approximately 140 systems, serving approximately 3.6 million people are estimated to have at least one sample detection of 1,1,2,2-tetrachloroethane greater than the ½ HRL and approximately 131 systems, serving approximately 3.5 million people are estimated to have at least one sample detection greater than the HRL.

- For 1,1,2,2-tetrachloroethane, in the Round 2 national cross-section, a total of 98,911 samples were collected from 24,800 PWSs. 1,1,2,2-Tetrachloroethane was detected at or above the MRL in 19 (0.08% of) systems. The maximum detection in the Round 2 cross-section was 2 µg/L and the median detection was 0.5 µg/L. Detections were found in PWSs in 9 of the Round 2 cross-section States. Eighteen PWSs had detections of 1,1,2,2-tetrachloroethane greater than ½ HRL and 17 PWSs had detections of 1,1,2,2-

tetrachloroethane greater than HRL. 1,1,2,2-Tetrachloroethane detections greater than the HRL were found in PWSs in 7 of the Round 2 cross-section States. A national extrapolation from the Round 2 cross-section results estimates 50 systems, serving approximately 5.6 million people, have at least one sample detection of 1,1,2,2-tetrachloroethane. Approximately 47 systems, serving approximately 1.1 million people are estimated to have at least one sample detection of 1,1,2,2-tetrachloroethane greater than ½ the HRL and approximately 45 systems, serving approximately 168,000 people are estimated to have at least one sample detection greater than the HRL.

Contents

Disclaimer iii

Acknowledgments v

Executive Summary vii

Exhibits xiii

Appendices xv

Acronyms xvii

1. Introduction 1

1.1 Regulatory Background 1
1.2 Sources of Data Used for Analysis 2
1.3 Threshold Evaluations 5
1.4 General Description of the Two-Stage Analytical Approach 6
1.5 Detailed Description of the Stage 1 Analytical Methodology 7
1.6 Analytical Tools 8

2. UCM Round 1 Data Overview 9

2.1 Description of Data 9
2.2 Data Management and Data Quality 10
2.3 Round 1 Data Bias and Representativeness: Further Data Quality Review and Editing 11
2.4 Data Characteristics Overview 14

3. UCM Round 2 Data Overview 18

3.1 Description of Data 18
3.2 Data Management and Data Quality 18
3.3 Round 2 Data Bias and Representativeness: Further Data Quality Review and Editing 19
3.4 Data Characteristics Overview 22

4. National Inorganics And Radionuclides Survey (NIRS) Data 25

4.1 Description of Data 25
4.2 Representativeness 25
4.3 Data Characteristics Overview 26
4.4 Supplemental IOC Data 27

5. Developing a Nationally Representative Perspective 28

6. Analysis of National Occurrence 31

6.1 Round 1 Contaminant Occurrence 31
6.2 Round 2 Contaminant Occurrence 32
6.3 NIRS Contaminant Occurrence 34
6.4 National Extrapolation of Stage 1 Occurrence Measures 35
6.5 Comparing Data Coverage of Round 1 and Round 2 36

7. Graphical and Spatial Assessments of the Contaminants Considered During CCL 2 Regulatory Determinations 39

7.1 Metolachlor 40
7.2 1,3-Dichloropropene 43
7.3 1,1,2,2-Tetrachloroethane 48

8. References 54

Exhibits

Exhibit 1.2.a. Diagram of the Inter-Relationship of the Databases, Monitoring Rounds and Contaminant Lists Discussed in the Report 3

Exhibit 1.2.b. List and Description of Contaminants with Round 1 and Round 2 Data Considered During CCL 2 Regulatory Determinations 4

Exhibit 1.2.c. Description of the Inorganic Chemical with data in NIRS Considered During CCL 2 Regulatory Determinations 5

Exhibit 1.5.a. Total Number Systems and Population Served Systems Used in All National Extrapolations 8

Exhibit 2.3.a. Summary of Round 1 Data Quantity and Quality for the States, Tribes and Territories 13

Exhibit 2.3.b. Summary of Round 1 Data Quantity and Quality for the States, Tribes and Territories 14

Exhibit 2.4.a. Round 1 Data – Number of Records and Systems by Source Water Type 15

Exhibit 2.4.b. Round 1 Data – Number of Records and Systems by System Type 16

Exhibit 2.4.c. Round 1 Data – Number of Records by Year and Source Water Type 17

Exhibit 2.4.d. Round 1 Data – Number of Records by Month and Source Water Type 17

Exhibit 3.3.a. Summary of Round 2 Data Quantity and Quality for the States, Tribes and Territories 21

Exhibit 3.3.b. Summary of Round 2 Data Quantity and Quality for the States, Tribes and Territories 22

Exhibit 3.4.a. Round 2 Data – Number of Records and Systems by Source Water Type 23

Exhibit 3.4.b. Round 2 Data – Number of Records and Systems by System Type 23

Exhibit 3.4.c. Round 2 Data – Number of Records by Year and Source Water Type 24

Exhibit 3.4.d. Round 2 Data – Number of Records by Month and Source Water Type 24

Exhibit 4.3.a. NIRS Data – Number of Records by Year 26

Exhibit 4.3.b. NIRS Data – Number of Records by Month 26

Exhibit 5.a. 24 Round 1 Cross-Section States and States Not Included in the Cross-Section 30

Exhibit 5.b. 20 Round 2 Cross-Section States and States Not Included in the Cross-Section 30

Exhibit 6.1.a. Round 1 Data – 24-State Cross-Section Summary of System-Level Occurrence for Contaminants Considered During CCL 2 Regulatory Determinations 32

Exhibit 6.1.b. Round 1 Data – 24-State Cross-Section Summary of Population Served-Level Occurrence for Contaminants Considered During CCL 2 Regulatory Determinations 32

Exhibit 6.2.a. Round 2 Data – 20-State Cross-Section Summary of System-Level Occurrence for Contaminants Considered During CCL 2 Regulatory Determinations 33

Exhibit 6.2.b. Round 2 Data – 20-State Cross-Section Summary of Population Served-Level Occurrence for Contaminants Considered During CCL 2 Regulatory Determinations 34

Exhibit 6.3.a. NIRS Data – Summary of Boron Occurrence in Surveyed Ground Water Systems - Based on the System Level 35

Exhibit 6.3.b. NIRS Data – Summary of Boron Occurrence in Surveyed Ground Water Systems - Based on Population Served 35

Exhibit 6.4. National Extrapolation of Stage 1 Occurrence Measures 36

Exhibit 6.5. States Common to Both Round 1 and Round 2, and Respective Cross-Sections 37

Exhibit 7.1.a. Geographic Distribution of Metolachlor Detections in Both Cross-Section and Non-Cross-Section States (Round 2 Data) 41

Exhibit 7.1.b. Geographic Distribution of Metolachlor Detection Frequencies in Cross-Section States (Round 2 Data) 41

Exhibit 7.1.c. Annual Frequency of Metolachlor Detections By Year (1992-1997) from the 19-State Round 2 Cross-Section 42

Exhibit 7.2.a. Geographic Distribution of 1,3-Dichloropropene Detections in Both Cross-Section and Non-Cross-Section States (Combined Rounds 1 and 2) 43

Exhibit 7.2.b. Geographic Distribution of 1,3-Dichloropropene Detection Frequencies in Cross-Section States (Upper Map: Round 1; Lower Map: Round 2) 44

Exhibit 7.2.c. Geographic Distribution of 1,3-Dichloropropene Detection Frequencies (upper map) and HRL Exceedance Frequencies (lower map) for All Round 1 and Round 2 Cross-Section States 46

Exhibit 7.2.d. Annual Frequency of 1,3-Dichloropropene Detections (left) and HRL Exceedances (right), 1985 - 1997, in Select Cross-Section States 47

Exhibit 7.2.e. Distribution of 1,3-Dichloropropene Detections (left) and HRL Exceedances (right) Among Select Cross-Section States 47

Exhibit 7.3.a. Geographic Distribution of 1,1,2,2-Tetrachloroethane Detections in Both Cross-Section and Non-Cross-Section States (Combined Rounds 1 and 2) 48

Exhibit 7.3.b. Geographic Distribution of 1,1,2,2-Tetrachloroethane Detection Frequencies in Cross-Section States (Upper Map: Round 1; Lower Map: Round 2) 49

Exhibit 7.3.c. Geographic Distribution of 1,1,2,2-Tetrachloroethane Detection Frequencies (upper map) and HRL Exceedance Frequencies (lower map) for All Round 1 and Round 2 Cross-Section States 51

Exhibit 7.3.d. Annual Frequency of 1,1,2,2-Tetrachloroethane Detections (left) and HRL Exceedances (right), 1985 - 1997, in Select Cross-Section States 52

Exhibit 7.3.e. Distribution of 1,1,2,2-Tetrachloroethane Detections (left) and HRL Exceedances (right) Among Select Cross-Section States 53

Appendices

APPENDIX A. Development of Health Reference Levels

APPENDIX B. Detailed Round 1 Data Summary for 1,3-Dichloropropene, and 1,1,2,2-Tetrachloroethane

APPENDIX C. Detailed Round 2 Data Summary for Metolachlor, 1,3-Dichloropropene, and 1,1,2,2-Tetrachloroethane

APPENDIX D. Detailed NIRS Data Summary for Boron

APPENDIX E. Data Summaries of Occurrence and Population Served for Four Contaminants Considered During CCL 2 Regulatory Determinations

Acronyms

AWWARF	American Water Works Association Research Foundation
CAS	Chemical Abstract Services
CCL	Contaminant Candidate List
CMR	Chemical Monitoring Reform
CWS	Community Water System
EPA	Environmental Protection Agency
GWUDI	Ground Water under Direct Influence
GW	Ground Water
HRL	Health Reference Level
IOC	Inorganic Chemical
MRL	Minimum Reporting Level (or Limit)
NCWS	Non-Community (or Transient) Water System
NIRS	National Inorganic and Radionuclides Survey
NPDWR	National Primary Drinking Water Regulation
NTNCWS	Non-Transient Non-Community Water System
OGWDW	Office of Ground Water and Drinking Water
PWS	Public Water System
PWSID	Public Water System Identifier
SDWA	Safe Drinking Water Act
SDWIS	Safe Drinking Water Information System
SDWIS/FED	Safe Drinking Water Information System/Federal Version
SOC	Synthetic Organic Chemical
SW	Surface Water

UCM	Unregulated Contaminant Monitoring
UCMR	Unregulated Contaminant Monitoring Regulation
URCIS	Unregulated Contaminant Monitoring Information System
VOC	Volatile Organic Chemical

1. Introduction

This report presents an analysis of national occurrence in public drinking water systems of four unregulated contaminants: one inorganic contaminant (IOC; boron), one synthetic organic contaminant (SOC; metolachlor), and two volatile organic contaminants (VOC; 1,3-dichloropropene and 1,1,2,2-tetrachloroethane). These four contaminants are on the second Contaminant Candidate List (CCL 2) for which the United States Environmental Protection Agency (EPA) is currently considering during the CCL 2 Regulatory Determination process.

Drinking water contaminant occurrence findings developed in this report are based on three different data sets. The Unregulated Contaminant Monitoring (UCM) program Round 1 and Round 2 monitoring data sets were collected under provisions of the Safe Drinking Water Act (SDWA). These data sets provide occurrence data for 1,1,2,2-tetrachloroethane, 1,3-dichloropropene, and metolachlor. The occurrence data for boron were collected through the National Inorganics and Radionuclides Survey (NIRS). Reviews of these unregulated contaminant occurrence data sets, as well as detailed occurrence findings for 1,1,2,2-tetrachlroethane, 1,3-dichloropropene, metolachlor and boron, are presented in this report. Additionally, the CCL 2 includes several contaminants monitored under the first Unregulated Contaminant Monitoring Regulation (UCMR 1). EPA presents the occurrence findings for ten UCMR 1 contaminants (DDE, DCPA, 1,3-dichloropropene, 2,4-dinitrotoluene, 2,6-dinitrotoluene, EPTC, fonofos, MTBE, perchlorate, and terbacil) in a separate report entitled *The Analysis of Occurrence Data from the First Unregulated Contaminant Monitoring Regulation (UCMR 1) in Support of Regulatory Determinations for the Second Drinking Water Contaminant Candidate List* (USEPA, 2006a).

For those contaminants considered as part of the CCL 2 Regulatory Determinations, a Regulatory Support Document (USEPA, 2006b) provides contaminant-specific information regarding chemical and physical properties, use and release, and supplemental occurrence data and analyses. Based on contaminant occurrence, exposure, and other risk considerations, EPA must determine if regulating these contaminants will present a meaningful opportunity to reduce public health risk.

1.1 Regulatory Background

Under §1412(b)(1) of the SDWA Amendments, EPA was required to publish a list of contaminants (the CCL) to assist in priority-setting efforts. The contaminants included on a CCL are not subject to any current or proposed National Primary Drinking Water Regulation (NPDWR). CCL contaminants may pose risks for drinking water, and therefore may require regulation under SDWA.

The first CCL (CCL 1) contained 60 contaminants, including 50 chemicals or chemical groups and 10 microbiological contaminants or microbial groups. In 2003, EPA released final regulatory decisions on nine of these contaminants (68 FR 42898). The second and current CCL (CCL 2: 70 FR 9071) contains 51 contaminants, consisting of all the contaminants from CCL 1 that did not progress to regulatory determination. The 1996 SDWA Amendments require EPA to make determinations on whether or not to regulate at least five contaminants on a five-year

cycle, or three and a half years after each CCL. This report presents contaminant occurrence findings that serve to support the second round of regulatory determinations.

1.2 Sources of Data Used for Analysis

Brief descriptions of the occurrence data sources used in this report are provided in this section (see Sections 2, 3, 4, and 5 for more details on data management). Occurrence data for three of the contaminants evaluated in this report (metolachlor, 1,3-dichloropropene, and 1,1,2,2-tetrachloroethane) were collected as part of Unregulated Contaminant Monitoring. The SDWA, Amendments of 1986 required PWSs to monitor for specified unregulated contaminants on a five-year cycle, and to report the monitoring results to the States. Data from the first round of monitoring starting in 1988 were stored in the Unregulated Contaminant Information System (URCIS) database, referred to in this report as the "Round 1 database." In 1993, Congress amended SDWA to add new contaminants for unregulated contaminant monitoring. Data from this second round of monitoring, starting in 1993, were stored in the Safe Drinking Water Information System/Federal version (SDWIS/FED[1]) database, referred to in this report as the "Round 2 database." Occurrence data for the fourth contaminant evaluated in this report, boron, is derived from the occurrence data collected under the National Inorganic and Radionuclides Survey.

Unregulated contaminants are contaminants that do not have an established or proposed NPDWR, but they may be formally listed and scheduled for monitoring under Federal regulations. The intent of the monitoring is to gather scientific information on the occurrence of these contaminants, to enable a decision regarding whether regulations were needed. EPA required all non-purchased community water systems (CWSs) and non-purchased non-transient non-community water systems (NTNCWSs) with more than 150 service connections to participate in this unregulated contaminant monitoring. Smaller systems were not universally required to participate in the monitoring, but they were required to be available for monitoring if the State decided such monitoring was necessary. (As evident in the data, many States did collect data from small systems as well.)

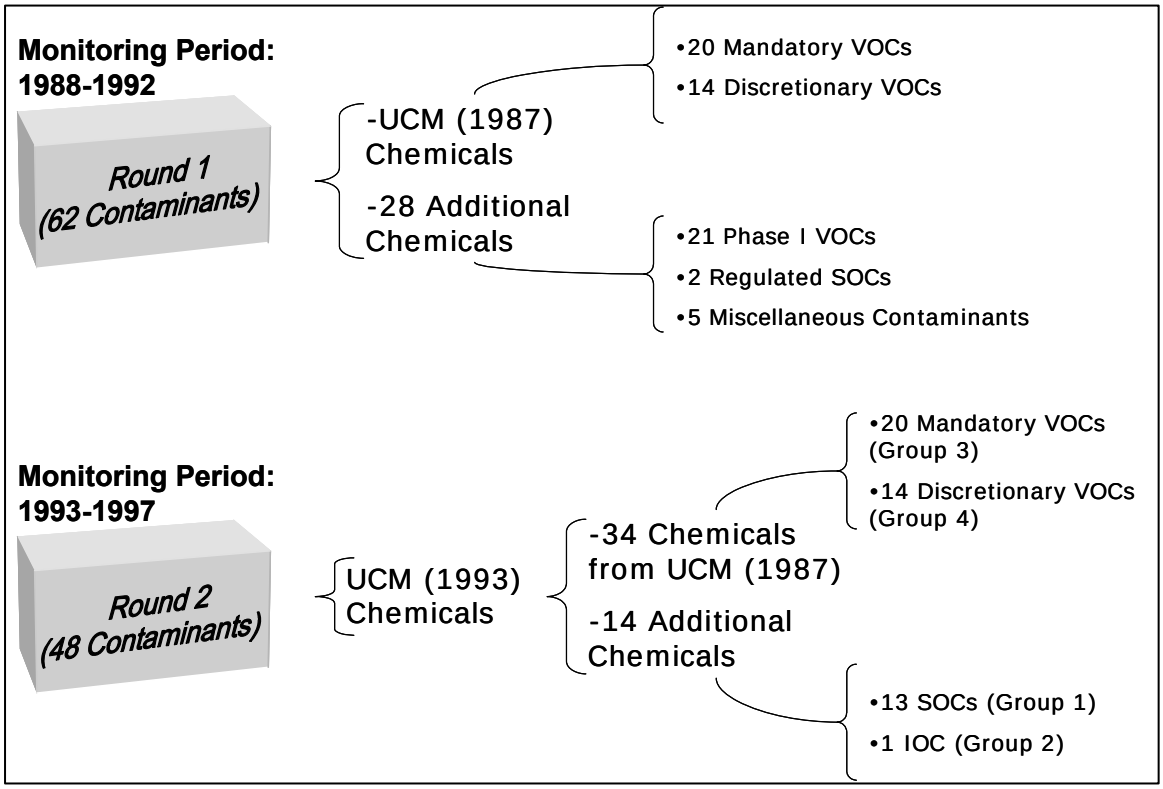
The 1993 SDWA Amendments added other contaminants to the unregulated contaminant list for required monitoring, and the 1996 SDWA Amendments directed EPA to develop a revised program for such monitoring. This new program was formally published in the Federal Register on September 17, 1999 (64 FR 50556), as the Unregulated Contaminant Monitoring Regulation, or UCMR 1. The UCMR 1, and related rules, replaced the older (UCM) requirements, putting forth a new list of contaminants, a new set of rules about which systems must monitor, a new structure to the monitoring program, and a new framework to ensure that all the monitoring results are reported to EPA. Monitoring under UCMR 1 began in 2001. Every five years the UCMR must produce a new list of unregulated contaminants for monitoring.

Exhibit 1.2.a diagrams the inter-relationship of the various databases, monitoring rounds and contaminant lists related to the Round 1 and Round 2 data. The Round 1 and Round 2 databases contain occurrence data from other contaminants besides those required as part of the UCM in 1987 (referred to as UCM [1987]) or as amended in 1993 (referred to as UCM [1993]).

[1] SDWIS/FED is the official database repository of data provided by public drinking water systems, and includes data from earlier EPA public water system databases.

Also, although each database primarily contains data collected during the years of the two formal monitoring periods (1988-1992 and 1993-1997), there are some earlier "grandfathered" data from years that pre-date the beginning of each of the respective monitoring periods.

Exhibit 1.2.a. Diagram of the Inter-Relationship of the Databases, Monitoring Rounds and Contaminant Lists Discussed in the Report



The UCM (1987) contaminants included 34 VOCs, divided into two groups: one with 20 VOCs for mandatory monitoring, and the other with 14 VOCs for discretionary monitoring. The UCM (1987) contaminants were first monitored coincident with the Phase I regulated contaminants, during the 1988-1992 period. This period is referred to as the "Round 1" monitoring period. The monitoring data collected by the PWSs were reported to the States (as primacy agents), but there was no protocol in place that defined reporting of these data to EPA.

The Round 1 data were stored in the URCIS (or "Round 1") database. Most of the Phase 1 regulated contaminants were also VOCs. Both the unregulated and regulated VOCs are analyzed using the same sample and the same laboratory methods. Hence, the Round 1 database included data on all of these 62 Round 1 contaminants: the 34 UCM (1987) VOCs; the 21 regulated Phase I VOCs; 2 regulated SOCs; and 5 miscellaneous contaminants that were voluntarily reported by some States (e.g., isomers of other organic contaminants). Details of the Round 1 database, its contained data, data quantity and quality, etc., are discussed in Section 2 of this report.

Monitoring for the UCM (1993) contaminants began coincident with the Phase II-V regulated contaminants in 1993 through 1998. This is often referred to as "Round 2" monitoring. The UCM (1987) contaminants were also included in the Round 2 monitoring. In the updated listing for the unregulated contaminants required for the monitoring, the UCM (1993) contaminants were listed as: Group 1 (13 SOCs); Group 2 (1 IOC); Group 3 (the 20 mandatory VOCs in UCM (1987)); and Group 4 (the 14 discretionary VOCs in UCM (1987)). The group numbering is somewhat reversed, with the first unregulated contaminants, from UCM (1987), in the last two groups. Data from Round 2 monitoring were stored in the SDWIS/FED (or "Round 2") database. Further details of the Round 2 database, its data and management, are discussed in Section 3 of this report.

Exhibit 1.2.b presents the list of three contaminants considered during CCL 2 Regulatory Determinations contained in the Round 1 and Round 2 databases. This table includes Chemical Abstract Services (CAS) number and Safe Drinking Water Information System (SDWIS) contaminant code, and indicates the monitoring Rounds and Group reference numbers for the contaminants. Note that the minimum reporting levels (MRLs) were not uniform for metolachlor, 1,3-dichloropropene, or 1,1,2,2-tetrachloroethane, as several analytical methods were used in analyzing these data. MRLs for metolachlor varied from 0.01 to 52 µg/L with a modal value of 0.2 µg/L. MRLs for 1,3-dichloropropene varied from 0.02 to 10 µg/L in Round 1 and from 0.08 to 1 µg/L in Round 2. The modal MRL in both rounds was 0.5 µg/L. MRLs for 1,1,2,2-tetrachloroethane varied from 0.01 µg/L to 10 µg/L in Round 1 and from 0.01 µg/L to 2.5 µg/L in Round 2. The modal MRL in both rounds was 0.5 µg/L.

Exhibit 1.2.b. List and Description of Contaminants with Round 1 and Round 2 Data Considered During CCL 2 Regulatory Determinations

Contaminant	CAS Number	SDWIS ID	Modal MRL (µg/L)	HRL (µg/L)	UCM Round		Common Sources of Contaminant
Synthetic Organic Chemicals							
Metolachlor	51218-45-2	2045	0.2	70	–	2	Herbicide for corn, soybeans, peanuts, cotton, pod crops
Volatile Organic Chemicals							
1,3-Dichloropropene	542-75-6	2413	0.5	0.4	1	2	Solvent, used in fungicide
1,1,2,2-Tetrachloroethane	79-34-5	2988	0.5	0.4	1	2	Used in paint manufacturing; cement; paint removers; moth-proofing

Modal MRL = Because different laboratory analytical methods were used during the approximately ten years of Round 1 and 2 monitoring, the resulting sample concentration data reflect a range of MRLs; the modal value is the most common MRL.
HRL = Health Reference Level (concentration values used only as reference levels for analyses in this report)
UCM Round = data included in Round 1 and/or Round 2 monitoring and database.

The third and final database used in this report is the NIRS database. Data used for analysis of the remaining IOC (boron) comes from this database. The NIRS data, collected for a statistically designed, nationally representative survey, can be used directly for national

contaminant occurrence analyses with very few, if any, data quality or use issues. One limitation, however, is that the NIRS data are from groundwater systems only. The NIRS data, and assessments of supplemental IOC data, are discussed in detail in Section 4.

The NIRS survey was designed and conducted by EPA specifically to provide data on the occurrence of a select set of radionuclides and IOCs being considered for National Primary Drinking Water Regulations. The NIRS provides contaminant occurrence data from approximately 989 nationally representative community PWSs served by ground water. Each of these statistically randomly selected PWSs was sampled a single time between 1984 and 1986. Exhibit 1.2.c describes the single inorganic contaminant for which occurrence was assessed in this report. The MRL for boron in the NIRS was always 0.005 mg/L.

Exhibit 1.2.c. Description of the Inorganic Chemical with data in NIRS Considered During CCL 2 Regulatory Determinations

Contaminant	CAS Number	MRL (mg/L)	HRL (mg/L)	Common Sources of Contaminant
Inorganic Chemicals				
Boron	7440-42-8	0.005	1.4	Naturally occurring in environment as borates, widely used in production of industrial and household goods

1.3 Threshold Evaluations

Assessments of contaminant occurrence included in this report are conducted relative to the MRL. Analytical detections are samples with contaminants detected at concentrations *equal to or greater than* the MRL. An analytical non-detection is a sample that either had no contaminant present and therefore detected no contaminant or had the contaminant present at a concentration less than the MRL (and therefore was undetected). Evaluations of occurrence relative to the MRL provide the baseline measure of occurrence.

Detections of the contaminants are also evaluated relative to at least two other concentration thresholds: the HRL and one-half the HRL (½ HRL). The HRL is an EPA-defined benchmark for evaluating contaminant occurrence based on preliminary health effects information. By conducting occurrence assessments relative to several thresholds (such as the MRL, ½ HRL, and HRL), additional information is provided on the degree as well as the frequency of contaminant occurrence. This serves to better characterize the distribution of occurrence.

EPA evaluated the best available, peer-reviewed assessments and studies to characterize the human health effects that may result from exposure to individual contaminants when found in drinking water. Based on this characterization, the Agency estimated an HRL for each contaminant. For more details regarding the development of the HRLs, see Appendix A in this report.

It is important to note that HRL values have been derived by EPA as a means to provide additional information regarding the distribution of occurrence and occurrence relative to concentrations of potential health effects. The values are draft, and only were developed to facilitate these analyses.

Some contaminants with analytical detects may not have been detected at concentrations greater than their respective HRL or ½ HRL. Although many of the 1,3-dichloropropene and 1,1,2,2-tetrachloroethane occurrence data in the cross-section were generated using analytical methods with MRLs that were higher than the HRL, all MRLs did fall within (or below) the risk range of 10^{-6} to 10^{-4} used by EPA to evaluate carcinogens. It is possible, though, that monitoring failed to identify some HRL exceedances at the participating systems. Using the Stage 1 analytical approach, direct occurrence measures cannot be made relative to concentration thresholds below (less than) the MRL. Thus, the HRL analyses might reflect underestimates of actual occurrence at concentrations above the ½ HRL and below the MRL. If warranted, the Stage 2 analytical approach (probabilistic modeling) can estimate system mean concentrations at any level above or below the MRL.[2]

1.4 General Description of the Two-Stage Analytical Approach

A two-stage analytical approach is used to evaluate the UCM Round 1 and 2 and NIRS contaminant occurrence data. The first stage of analysis provides a straightforward evaluation of occurrence of all contaminants under consideration. This "Stage 1 analysis" of occurrence assesses the data sources, quality, and characteristics, and then uses the data to conduct simple, non-parametric, and conservative assessments for a broad evaluation of contaminant occurrence.[3] Occurrence analyses for each contaminant are assessed for samples, systems, and population served by systems. A typical Stage 1 analysis is a simple count of the number (or percentage) of systems with at least one analytical detection of a specific contaminant, or at least one analytical detection with a concentration greater than an HRL.

Any contaminant found to have significant occurrence at or near HRL concentrations based on the Stage 1 analysis can additionally be analyzed using the "Stage 2 analysis." The Stage 2 analysis generates an estimated number of systems with a mean contaminant concentration exceeding a specified threshold and includes measures of uncertainty (corresponding confidence intervals based on calculated standard errors). The Stage 2 analysis uses statistical modeling to generate national probability estimates of contaminant occurrence by generating estimated annual mean concentrations of contaminants at PWSs. This provides an occurrence analysis that is less conservative since it is based on estimated annual mean concentrations rather than maximum sample concentration results as in the Stage 1 analysis. The Stage 2 analysis also provides more direct estimates of potential chronic exposure since it is based on estimated annual (long-term) mean concentrations of contaminant occurrence. In a

[2] Stage 2 analysis allows an assessment of systems with mean, rather than peak, concentrations estimated to exceed the HRL and ½ the HRL. Because the Stage 2 mean concentration estimates are based on annual, or longer-term, occurrence data, the Stage 2 analyses may be more appropriate for contaminants with chronic health effects.

[3] These analyses are conservative in the sense that they are protective of human health (i.e., they are more likely to overestimate risks to human health than underestimate them).

general sense, the Stage 1 analysis reflects an approximation of peak analytical results while the Stage 2 analysis estimates long-term, average occurrence.

Because none of the contaminants discussed in this report were found with significant levels of contaminant occurrence at or near the HRLs of concern based on the Stage 1 analyses, Stage 2 analyses were not warranted for any of the contaminants.[4] The two-stage analytical approach was previously developed for other EPA Office of Ground Water and Drinking Water (OGWDW) national occurrence studies, including the first Six-Year Review of National Primary Drinking Water Regulations (see USEPA, 2003a). This data management and occurrence analytical approach was previously peer-reviewed for use under the Six-Year Review and, partly for consistency across OGWDW projects, has been adapted for the analyses of the CCL 2 Regulatory Determination occurrence data. A detailed description of the Stage 1 analytical approach is included in Section 1.5 below. For more details on the Stage 2 analytical approach, see Section 5 and Appendix B of *The Analysis of Occurrence Data from the First Unregulated Contaminant Monitoring Regulation (UCMR 1) In Support of Regulatory Determinations for the Second Drinking Water Contaminant Candidate* List (USEPA, 2006a).

1.5 Detailed Description of the Stage 1 Analytical Methodology

Stage 1 analysis provides a conservative assessment of occurrence by counting the number of PWSs with *at least one analytical result* that exceeds a concentration equal to the MRL, ½ HRL, and the HRL for each contaminant. Hence, these Stage 1 analyses are essentially based on the single maximum analytical value recorded at each PWS. The Stage 1 analyses are conservative – cautious regarding public health concerns – in the sense that they are descriptive statistics based on peak, rather than long-term mean, concentrations of contaminants. The Stage 1 analyses are conducted at both the system level and the population-served level, allowing exposure to be characterized both in terms of the number and percent of systems with detections, and the number and percent of population-served by systems with detections. Estimates based on the population served by PWSs provide a preliminary characteristic of exposure potential.

By conducting the Stage 1 analyses at the system level and not the sample level, several biases of the Round 1 and Round 2 sampling methodology are avoided. During Round 1 and Round 2 monitoring, when detects were found in a system, sampling frequency increased for that system. Conducting Stage 1 analyses at the sample level, consequently, would bias the results toward increased detection frequencies. As such, the detection frequency portion of Stage 1 analyses was conducted only on systems and the population-served. The only sample-level analyses that were conducted were calculations of the minimum, median, maximum, and 99th percentile values. Note that due to the inherent vulnerability, occurrence pattern, and some regulatory differences between surface water-supplied and ground water-supplied PWSs, separate analyses were generated for surface water (SW) systems and ground water (GW) systems. All Stage 1 analytical findings are presented in Appendix B (for Round 1), Appendix C

[4] It is important to note that Stage 2 analysis would not have been appropriate for the NIRS data. Stage 2 uses multiple records for a specific contaminant per system to model a system's long-term mean concentration. As the NIRS only contains one record per contaminant per system, Stage 2 analyses were therefore not appropriate for the NIRS data set.

(for Round 2), and Appendix D (for the NIRS). At the beginning of the Appendices section, the "List of Appendix Tables" identifies all tables included in each of the three appendices.

1.5.1 Extrapolation of National Cross-Section Results

The development of the UCM Round 1 and Round 2 national cross-sections enables occurrence analyses that are indicative of national occurrence. In addition, the NIRS data were collected for a statistically designed, nationally representative survey. Extrapolations provide the best available estimate of contaminant occurrence on a nationwide scale. To calculate the extrapolations, the total national number of systems (or population served by systems) estimated to exceed a specified threshold is generated by multiplying the representative cross-section (or NIRS) percentage of systems with a threshold exceedance (e.g., % systems > ½ HRL) by the national numbers for systems (and population served by systems) documented in the *Water Industry Baseline Handbook, Second Edition - 2000* (USEPA, 2000).

Exhibit 1.5.a. Total Number Systems and Population Served Systems Used in All National Extrapolations

Source Water Type	National Inventory of CWSs plus NTNCWSs	
	Systems	Population
Ground Water	59,440	85,681,696
Surface Water	5,590	127,326,486
Total	65,030	213,008,182

Source: USEPA, 2000.

To estimate the national number of ground water systems with a detection of metolachlor, for example, the percentage of ground water systems from the Round 2 cross-section with detections of metolachlor (0.113%) is multiplied by the total number of ground water systems nationally (59,440 systems). The resulting estimate equals 67 systems (59,440*0.00113=67). The national estimate of population exposed to a given contaminant is extrapolated in a similar fashion (i.e., the proportion of population served by a system with a threshold exceedance is multiplied by the total population served nationally). Extrapolated results are presented in Section 6.4 and Appendix E.

1.6 Analytical Tools

All statistical analyses, and most management efforts, were conducted with SAS® statistical software. Some data formatting problems were corrected in Microsoft® Excel with the aid of specialized programs written in Visual Basic® or were corrected directly in SAS before the analysis began.[5] After analysis, results were typically exported into Excel for secondary analysis, sorting, or the development of report tables.

[5] SAS is a registered trademark of the SAS Institute, Inc. Excel and Visual Basic are trademarks of the Microsoft Corporation.

2. UCM Round 1 Data Overview

In this section of the report, the monitoring results for the Unregulated Contaminant Monitoring program Round 1 data (from approximately 1988-1992) are reviewed. The data were derived from EPA's Unregulated Contaminant Information System database. As described previously, this report refers to URCIS as the Round 1 database.

2.1 Description of Data

The Round 1 database is a compilation of PWS monitoring results for unregulated contaminants, collected under the authority of SDWA, and reported to the States (as the primacy agents for SDWA). EPA requested that the States submit these data to EPA in the early 1990s, but no formal protocol or format had been established for reporting. Given the evolving nature of data management during this era various problems were encountered. The data were supplied by States on a variety of media, ranging from photocopies of hand-written files to electronic files on magnetic tape or diskettes of various kinds, and in many different formats and software configurations. Some data were electronically transferable, other data had to be manually entered or re-entered. EPA worked on the entry, cleanup, and analysis of these data during the 1990s. Through this long effort, many critical data quality problems were resolved (such as getting the data into consistent, standard units of measure).[6]

Data from Round 1 were reviewed, edited, and analyzed by the EPA in several other studies. Some preliminary analyses of the Round 1 data were presented in the occurrence data report produced for EPA's Office of Ground Water and Drinking Water (OGWDW) Chemical Monitoring Reform (CMR) project. That report, *A Review of Contaminant Occurrence in Public Water Systems* (USEPA, 1999), is referred to as the "CMR Report." Additionally, an occurrence review of select unregulated contaminants based on the Round 1 and Round 2 data is presented within the EPA report *Analysis of National Occurrence of the 1998 Contaminant Candidate List (CCL) Regulatory Determination Priority Contaminants in Public Water Systems* (USEPA, 2002), referred to as the "*Priority Contaminants Report.*" The *Priority Contaminants Report* presents a comprehensive overview of national occurrence data for eight contaminants on the 1998 CCL. It was followed by the *Analysis of National Occurrence of 14 Contaminants from the 1998 Contaminants Candidate List (CCL)* (USEPA, 2003), referred to as the "*Occurrence of 14 Report*." The *Occurrence of 14 Report* contains Round 1 analyses for two of the contaminants discussed in this current report (1,3-dichloropropene and 1,1,2,2-tetrachloroethane). As descriptions of occurrence based on the Round 1 database have been covered thoroughly elsewhere, this current report presents only the information related to understanding occurrence findings for the contaminants considered during CCL 2 Regulatory Determinations. For the most comprehensive description of the creation and management of the Round 1 database, refer to Section II of the *Priority Contaminants Report*.

[6] For examples of data problem resolution, see Fallon, Fran, 1994 (November), "Unregulated Contaminants Information System (URCIS) System Inventory;" Computer Sciences Corp, 1993 (March), "Unregulated Contaminants Maintenance Manual;" Fallon, Fran, 1993 (December), "Unregulated Contaminants Maintenance Manual Supplement;" and, Computer Sciences Corp, 1992 (July), "A Statistical Survey of the Unregulated Contaminant Data." (All of these internal reports contain many pages of text, sometimes unnumbered, and typically many pages of unnumbered tabulated data and/or computer code.)

The version of the Round 1 database used as the basis for this current analysis was the same final edited version developed and used for the regulatory determinations made on the 1998 CCL 1 contaminants. Some of the actual analytical findings developed and presented in the *Occurrence of 14 Report* (USEPA, 2003) are used in the current report. Other analyses, including new analyses using updated HRLs, have been conducted for and are presented for the first time in this current report.

The Round 1 database (as noted in Section 1) includes information on 62 contaminants, including: 34 unregulated VOCs; 2 regulated SOCs and 21 regulated VOCs; and 5 miscellaneous contaminants reported by the States. The data were reported from 38 States, Washington, D.C., and the Virgin Islands. The data are from the first round of required unregulated contaminant monitoring initiated in 1987 (i.e., UCM (1987)), but also include older data that are comparable to, but predate, the formal beginning of first round monitoring.

2.2 Data Management and Data Quality

During 1997-1998, the Round 1 database was reviewed for various data quality problems and subsequently edited to remove problematic data to ensure the quality of the data used in the analysis. In the process of initial database download and translation, unreadable lines of text and characters were apparently introduced into the data set and were subsequently deleted. (These lines did not appear to be actual data, but were artifacts related to the download, translation, and merger of various data sets.) Additionally, data from 946 systems of unknown source water type were eliminated. (Other systems had no source type specified, but this missing inventory information was supplemented with SDWIS inventory data.) Five observations with contaminant concentrations greater than 9,000 µg/L were excluded from the analysis (as presumed errors; this outlier editing was consistent with other processing that EPA has completed, see USEPA, 1999). Another 1,503 observations with erroneous sampling dates (e.g., years indicated as 00, 01, 39, etc.) were eliminated. In addition to these, a variety of other post-download editing procedures were conducted to fill in data gaps, eliminate inconsistencies, and reduce potential sources of error. A more detailed description of these procedures is discussed in Section II.B of the *Priority Contaminants Report* (USEPA, 2002). After these data management and editing efforts, the Round 1 database contained 3,452,530 analytical records for 62 contaminants.

Even with these management endeavors, there are still potential data quality problems given the diverse sources of the data and the sheer size of the database (i.e., 3.5 million records). Sources of problems may include some data recorded in incorrect units, (e.g., the results are actually in mg/L, but are recorded as µg/L) or data units mistakenly converted in the original compilation of the data (e.g., the data units were actually in µg/L, were incorrectly assumed to be in mg/L, and were then mistakenly 'converted' to µg/L as if they were mg/L). Reviews of the original database found that this did not affect many data. There are a few apparently high analytical results (outliers) that may be caused by this units problem. While outliers affect a review of the maximum concentration values of a contaminant, there are few such data and they will have limited impact on other occurrence statistics reviewed in this report. (For most analytical summaries included in this report, the value of the 99th percentile is presented to avoid this problem.)

2.3 Round 1 Data Bias and Representativeness: Further Data Quality Review and Editing

Subsequent to the major editing efforts on this database, a basic analysis of the 3.5 million records was undertaken. As a first step, various descriptive statistics were compiled by State to enable a further data review for bias and representativeness. Some State data, as will be described, are so incomplete that their use would introduce bias into the analyses. This was an important factor of the data quality assessment when reviewing data to determine whether they can be used for Stage 2 analysis. These data are used in certain parts of this report to provide context or reference, but not to make determinations based on their occurrence analyses.

Exhibits 2.3.a. and 2.3.b summarize some key results from this next stage of data review. Together, they summarize the data availability for 57 primacy entities considered under SDWA: the 50 States, 5 territories, the District of Columbia, and an aggregate entry for the Native American Tribes. Within the Round 1 database there are data for 38 States, the Virgin Islands, and Washington, D.C., and no data for 17 primacy entities. Some States only reported data for detections. For eight States (identified in Exhibit 2.3.b as "Entities with Data sets with 100% Detects"), the percent of samples with analytical detections (i.e., analytical results equal to or greater than the MRL) ranged from 80-100%. These States only reported data for detections and, hence, are highly biased (they did not report the majority of the monitoring sample results for which there were no detections above the MRL). As presented in Exhibit 2.3.a, the percent of samples with detections (aggregating all the data), typically ranged from 1-5% for States with complete data reporting.

The number of unique PWSs included in each State's data record is shown in Exhibit 2.3.a. The number of PWSs included were compared to the total number of non-purchased CWSs and NTNCWSs in the current State inventory, and to the number of non-purchased CWSs and NTNCWSs serving more than 500 people (since not all small systems may have had to conduct this monitoring). The States identified as "Most Complete Data Sets" in Exhibit 2.3.b all approximated or exceeded 100% of one of these numbers (i.e., New Mexico's Round 1 PWS numbers were only 70% of their current total inventory, but equaled 300% of the number of systems serving more than 500 persons). The States identified as "Significantly Too Few Systems" had far less representativeness. For example, Colorado only has Round 1 data for 60 PWSs. This represents only 24% of the reported number of systems in their inventory lists. Also, Colorado data show 34% of all sample data are detections. Further review suggests that their data mainly include records for systems that had detections, but that analytical records were provided for all samples for these systems. This partial, selective reporting lowers the percent of sample records that represent detections (to less than 100% detection), but still reflects biased reporting and creates a biased analytical record, since not all non-detection records have been reported (such as records from the likely large number of systems with non-detections). In other cases, it is not clear what the data represent. Nevada's reported percent samples with detections suggests the data may be complete, but there is only data for 10 systems – about 3% of systems as based on State inventory records. Another five States are identified as having too few systems.

Exhibit 2.3.a also presents the number of samples per PWS in each State's data. This summary statistic provides a perspective on the relative completeness of reporting. For example,

the States reporting only samples with detections typically reported 2 to 10 samples per PWS. For most States, approximately 100 to 300 samples were collected and reported per PWS.

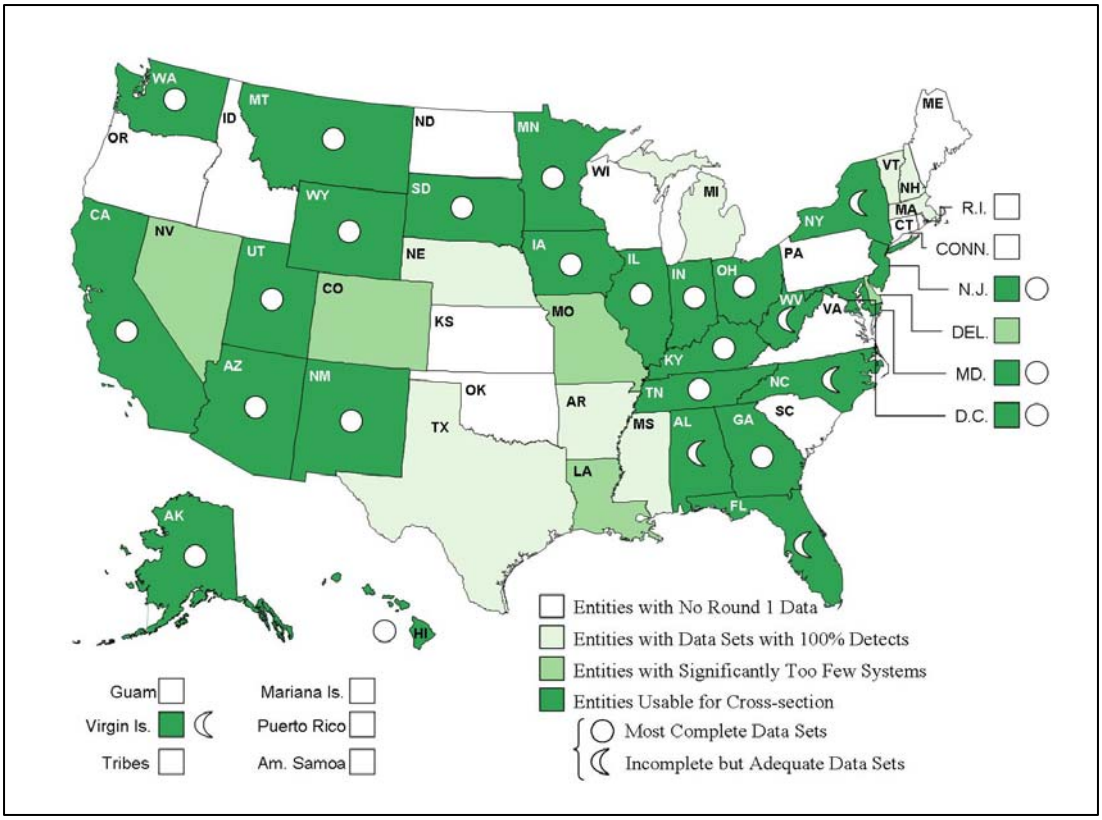
The last category in Exhibit 2.3.b identifies States with data records that are not complete (i.e., less than 100% of systems reported as based on inventory listings), but that have other parameters (e.g., "Percent Sample Detections," "Samples per PWS," etc.) that suggest that the data are balanced and perhaps complete for the systems that did report. The relatively low system numbers may simply relate to how the State implemented the program (e.g., implementation related to system size or other waivers, etc.). For example, Florida reported data for 855 PWSs, a substantive number, but it's only a small share of their relatively large inventory. Nevertheless, the whole data picture for Florida (e.g., the total detection rate) appears balanced.

In summary, of the 40 States/territories with Round 1 data, 21 States had records that appear relatively complete and balanced, and another 6 had records that likely are balanced and with a substantial (though not complete) number of systems. The data from these 27 States should provide the most complete and unbiased summary of the occurrence data; the remaining 13 States are clearly biased since results were reported only (or primarily) for detections. To present a national summary of the data, the 27 primacy entities with most complete records were evaluated for their national representativeness (to be discussed in Section 4) and considered for inclusion in the subsequent analyses.

Exhibit 2.3.a. Summary of Round 1 Data Quantity and Quality for the States, Tribes and Territories

	States/ Tribes/ Territories	Total Unique PWSs	Percent Sample Detections	Samples per PWS		States/ Tribes/ Territories	Total Unique PWSs	Percent Sample Detections	Samples per PWS
1	*Alabama*	152	5%	136	30	*Nebraska*	214	100%	6
2	*Alaska*	748	2%	132	31	*Nevada*	10	2%	860
3	*American Samoa*	-			32	*New Hampshire*	201	100%	5
4	*Arizona*	973	1%	151	33	*New Jersey*	1,551	2%	94
5	*Arkansas*	6	100%	5	34	*New Mexico*	617	0%	151
6	*California*	4,167	7%	111	35	*New York*	357	1%	348
7	*Colorado*	60	34%	38	36	*North Carolina*	298	2%	134
8	*Connecticut*	-			37	*North Dakota*	-		
9	*Delaware*	13	6%	1,207	38	*Ohio*	2,657	1%	313
10	*Florida*	855	20%	14	39	*Oklahoma*	-		
11	*Georgia*	1,165	2%	120	40	*Oregon*	-		
12	*Guam*	-			41	*Pennsylvania*	-		
13	*Hawaii*	127	1%	370	42	*Puerto Rico*	-		
14	*Idaho*	-			43	*Rhode Island*	-		
15	*Illinois*	1,307	5%	147	44	*South Carolina*	-		
16	*Indiana*	415	4%	292	45	*South Dakota*	335	4%	52
17	*Iowa*	1,002	5%	62	46	*Tennessee*	306	4%	197
18	*Kansas*	-			47	*Texas*	124	98%	2
19	*Kentucky*	525	3%	273	48	*Tribes*	-		
20	*Louisiana*	13	3%	95	49	*Utah*	430	1%	150
21	*Maine*	-			50	*Vermont*	133	82%	10
22	*Mariana Is.*	-			51	*Virgin Islands*	3	9%	186
23	*Maryland*	998	2%	105	52	*Virginia*	-		
24	*Massachusetts*	220	91%	14	53	*Washington*	992	1%	229
25	*Michigan*	139	100%	16	54	*Washington, D.C.*	1	5%	3,432
26	*Minnesota*	1,565	1%	100	55	*West Virginia*	139	6%	157
27	*Mississippi*	206	100%	6	56	*Wisconsin*	-		
28	*Missouri*	85	1%	215	57	*Wyoming*	145	3%	125
29	*Montana*	565	2%	94	TOTAL		**23,819**	**2.9%**	**146**

Exhibit 2.3.b. Summary of Round 1 Data Quantity and Quality for the States, Tribes and Territories



From the 27 States with reasonably complete data, three primacy entities were removed. Washington, D.C. and the Virgin Islands were removed because they are not States, and the New York State data were excluded because there were various and numerous problems associated with the data and metadata. For example, New York did not use standard PWS identifiers (PWSIDs) that could be associated with SDWIS records, and the total number of reporting PWSs in the New York data set represented only 12 to 40% of the expected number of PWSs as based on the State's inventory numbers. Also, there were some embedded errors in the data that sometimes caused data processing problems. Therefore, as summarized in Section 6, data are aggregated for a representative cross-section of 24 States (the 27 entities less Washington, D.C., the Virgin Islands, and New York), as well as for all 40 entities (which includes all entities; those with complete and balanced records, as well as the entities with biased records).

2.4 Data Characteristics Overview

After data management and editing, 3.45 million records were available for analysis representing more than 24,000 PWSs from the 40 States/entities. For the 24 States comprising the Round 1 representative cross-section (see Section 6 for a discussion regarding cross-section), the analytical results total 3.27 million records, from 22,034 PWSs.

Exhibit 2.4.a reports the number and percentage of sample records and systems related to source water type: 87% of the systems are classified as ground water and 13% as using surface water. The Round 1 data were collected before "ground water under the direct influence of surface water" (GWUDI) was introduced as a source definition. The classification used follows the regulatory guidelines: if a system uses any surface water, the system is classified, and is required to monitor, as a surface water system.

Exhibit 2.4.a. Round 1 Data – Number of Records and Systems by Source Water Type

SOURCE TYPE	RECORDS		SYSTEMS	
	NUMBER	*PERCENT*	*NUMBER*	*PERCENT*
All States - Ground Water	2,950,618	85.5%	21,046	87.1%
All States - Surface Water	501,912	14.5%	3,130	12.9%
All States - Total	**3,452,530**	**100.0%**	**24,176**	**100.0%**
24 States - Ground Water	2,814,472	86.1%	19,637	87.9%
24 States - Surface Water	453,173	13.9%	2,695	12.1%
24 States - Total	**3,267,645**	**100.0%**	**22,332**	**100.0%**

Note: There are a greater number of "Total" and "24 States Total" systems here than in Exhibit 2.4.b since some water systems have more than one source water type.

Exhibit 2.4.b shows the number and percent of records and systems by system type. About 7% of systems were coded as "NCWS," a SDWIS code typically used for transient systems. Transient PWSs were not required by Federal rule to monitor, but may have been required to by some States. Also, about 7% of the systems did not indicate a system type (and the type could not be determined by SDWIS inventory records). These data remained in the database for the first stages of analysis, because other data elements were complete.

Exhibit 2.4.b. Round 1 Data – Number of Records and Systems by System Type

SYSTEM TYPE	RECORDS		SYSTEMS	
	NUMBER	*PERCENT*	*NUMBER*	*PERCENT*
All States - CWS [1]	2,608,840	75.6%	15,562	65.3%
All States - NCWS [2]	89,707	2.6%	1,771	7.4%
All States - NTNCWS [3]	516,047	14.9%	4,872	20.5%
All States - UNKNOWN	237,936	6.9%	1,614	6.8%
All States - Total	**3,452,530**	**100.0%**	**23,819**	**100.0%**
24 States - CWS [1]	2,546,144	77.9%	14,260	64.7%
24 States - NCWS [2]	89,533	2.7%	1,746	7.9%
24 States - NTNCWS [3]	515,807	15.8%	4,774	21.7%
24 States - UNKNOWN	116,161	3.6%	1,254	5.7%
24 States - Total	**3,267,645**	**100.0%**	**22,034**	**100.0%**

1. CWS = Community Water System
2. NCWS = Non-Community (Transient) Water System
3. NTNCWS = Non-Transient Non-Community Water System
Note: There are a fewer number of "Total" and "24 States Total" systems here than in Exhibit 2.4.a since some water systems have more than one source water type.

Exhibits 2.4.c and 2.4.d show the distribution of data by year and by month for States in the 24-State cross-section for the years 1983-1992. This period includes the compliance cycle (1988-1992) when the majority of data were collected, with a peak of data collection in 1991. Records prior to 1988 predate the formal beginning of first round monitoring, but represent comparable data, and are therefore included to expand the coverage of these analyses. Exhibit 2.4.c shows the distribution of records for the years 1983-1992[7], while Exhibit 2.4.d shows the monthly distribution of all the records used in the Round 1 analyses for the same time period.

Records were well distributed throughout the year, with an average of 272,304 records per month for the 24-State cross-section. Although in the month of March there is a slightly greater monthly percentage of data, there is no significant difference, suggesting that there should be no seasonal bias due to monthly differences in reporting. For Round 1 data from the 24-State cross-section, the total number of records during the compliance period of 1988 to 1992 ranged between 321,618 in 1988 and 1,280,797 in 1991, with an average of 556,358 records per year. By month for the 24-State cross-section, the total number of records ranged between 221,314 (July) and 371,492 (March), with an average of 272,304 records per month. For a more detailed coverage of these numbers and other Round 1 data statistics, refer to Section II.D of the *Priority Contaminants Report* (USEPA, 2002).

[7] Some data contained in the Round 1 data set are older, "grandfathered" data that predate the formal beginning of the 1988-1992 Round 1 monitoring period.

Exhibit 2.4.c. Round 1 Data – Number of Records by Year and Source Water Type

YEAR	# SURFACE WATER RECORDS	# GROUND WATER RECORDS	TOTAL # RECORDS	% OF TOTAL RECORDS
24 States - 1983	0	5	5	0.0%
24 States - 1984	30	43,837	43,867	1.3%
24 States - 1985	175	78,696	78,871	2.4%
24 States - 1986	1,852	140,155	142,007	4.3%
24 States - 1987	12,867	120,292	133,168	4.1%
24 States - 1988	107,428	214,190	321,618	9.8%
24 States - 1989	111,979	337,068	449,047	13.7%
24 States - 1990	87,273	509,889	597,162	18.3%
24 States - 1991	106,338	1,174,459	1,280,797	39.2%
24 States - 1992	25,222	195,881	221,103	6.8%
24 States - Total	**453,164**	**2,814,472**	**3,267,645**	**100.0%**

Exhibit 2.4.d. Round 1 Data – Number of Records by Month and Source Water Type

MONTH	# SURFACE WATER RECORDS	# GROUND WATER RECORDS	TOTAL # OF RECORDS	% OF TOTAL RECORDS
24 States - January	33,315	266,685	300,000	9.2%
24 States - February	42,774	259,528	302,302	9.3%
24 States - March	42,903	328,589	371,492	11.4%
24 States - April	33,625	262,270	295,895	9.1%
24 States - May	45,221	254,900	300,121	9.2%
24 States - June	38,140	190,791	228,931	7.0%
24 States - July	31,060	190,254	221,314	6.8%
24 States - August	40,967	185,958	226,925	6.9%
24 States - September	33,214	209,679	242,893	7.4%
24 States - October	35,756	222,984	258,740	7.9%
24 States - November	39,480	215,372	254,852	7.8%
24 States - December	36,718	227,462	264,180	8.1%
24 States - Total	**453,173**	**2,814,472**	**3,267,645**	**100.0%**

The analytical findings of the 24-State Round 1 cross-section occurrence data for 1,3-dichloropropene and 1,1,2,2-tetrachloroethane are developed and summarized in Section 6 of this report.

3. UCM Round 2 Data Overview

In this section of the report, the monitoring results for the UCM (1993) list of unregulated contaminants, from Round 2 (approximately 1992-1997), are analyzed and reviewed. These Round 2 data (as discussed in Section 1) were derived from the SDWIS/FED (or "Round 2") database. Significant data review, formatting, and data quality checking and editing were required of these Round 2 data to enable the evaluations and analyses conducted.

3.1 Description of Data

The analyses in this section of the report are based on Round 2 data derived from the monitoring data collected between 1992 and 1997 and subsequently submitted to EPA. (Although the Round 2 monitoring period was formally initiated in 1993, data in the Round 2 data set include some older, "grandfathered" data from 1992.) The Round 2 database includes information on 48 contaminants, including: 1 IOC, 13 SOCs, 20 mandatory VOCs and 14 discretionary VOCs. These data are from 35 States/primacy entities.

Like the Round 1 data, much of the Round 2 data analyses and all of the data management and editing was conducted and described previously in several EPA reports. The two most relevant of these reports are the *Analysis of National Occurrence of the 1998 Contaminant Candidate List (CCL) Regulatory Determination Priority Contaminants in Public Water Systems (the "Priority Contaminants Report;"* USEPA, 2002), which contains more detailed information on data management and analysis of the Round 2 database, and the *Analysis of National Occurrence of 14 Contaminants from the 1998 Contaminant Candidate List (CCL) (the "Occurrence of 14 Report;"* USEPA, 2003), which contains Round 2 analyses for 3 of the contaminants discussed in this report (1,3-dichloropropene, 1,1,2,2-tetrachlorethane, and metolachlor). For the most comprehensive description of the creation, management, and maintenance of the Round 2 database, refer to Section III of the *Priority Contaminants Report* (USEPA, 2002). Some of the actual analytical findings developed and presented in USEPA (2003) are used in this current report. Other analyses, including those based on updated HRLs, have been conducted for, and are presented in, this current report.

3.2 Data Management and Data Quality

The raw Round 2 data from the 35 States/primacy entities contained a total of 4,350,874 records. An important and substantial component of the *Priority Contaminants Report* (USEPA, 2002) consisted of the detailed and extensive review of these data records for numerous data quality considerations including reporting consistencies, uniform and valid coding, data completeness, correct and consistent use of analytical units, and any inherent bias in the raw records. To ensure data quality for sound and dependable occurrence analysis, extensive data review, checking, and editing were required. This data management and quality review process identified and addressed problematic data or data that could not be uniquely categorized. For more information on the types of problematic data encountered and how they were managed, refer to Section III.B of the *Priority Contaminants Report* (USEPA, 2002). With these data quality improvements, the initial 4,350,874 analytical records from the 35 States/primacy entities for the 48 contaminants decreased to 4,211,446 analytical records for this Round 2 analysis.

3.3 Round 2 Data Bias and Representativeness: Further Data Quality Review and Editing

Subsequent to this initial editing and filtering of the data, a basic analysis of the 4.21 million records was undertaken. Similar to the Round 1 data, various descriptive statistics were compiled by State to enable a further more detailed data review to assess data bias and representativeness. Some State data, as described below, are seriously biased because they are so incomplete, and should only be used with caution for any statistical summary of occurrence.

Exhibits 3.3.a and 3.3.b summarize some key results from this next stage of Round 2 data review. Together, they summarize the data availability and data quality for 57 primacy entities considered under SDWA (the 50 States, 5 territories and the District of Columbia, and an aggregate entry for the Native American Tribes). Of the 57 primacy entities in Round 2, 35 have reported Round 2 data and 22 have not. Exhibit 3.3.a also provides an overview of data quality, while Exhibit 3.3.b presents the 20 States (the States identified with data sets of adequate quality and completeness) that comprise the 20-State cross-section for Round 2 data.

Of the 35 States with Round 2 data, 15 States have incomplete data and/or data of inadequate quality. For two States (Alabama and Mississippi), the percent of samples with detections (with analytical results equal to or greater than the MRL; "Percent Sample Detections") ranged from 70-100%. These States are identified in Exhibit 3.3.b as "Entities with Data sets with 100% Detects." These States reported only (or mainly) analytical records for detections and, hence, their data sets are highly biased (over-representing occurrence) and are therefore excluded from additional analysis. As can be seen in the table, the percent samples with detections typically range from 1% to 8% for States with approximately complete data reporting. An additional secondary check on these two States reporting only analytical detections is the measure of the number of samples per PWS. The numbers of samples per PWS for Alabama (2 samples/PWS) and Mississippi (4 samples/PWS) are significantly below the common range of 50 to 250 samples per PWS in most States.

The number of unique PWSs included in each State's data sets, and the number of samples per PWS, are also included in Exhibit 3.3.a. These summary statistics provide a perspective on the relative completeness of reporting. The number of PWSs included were compared to the total number of non-purchased CWSs and NTNCWSs in the current State inventory, and to the number of non-purchased CWSs and NTNCWSs serving more than 500 people (since not all small systems may have had to conduct this monitoring). Most States approximated or exceeded 100% of one of these comparative inventory numbers. The States (entities) identified with "Significantly Too Few Systems" in Exhibit 3.3.b have data reported from far fewer systems than listed in the current State inventory. For example, New Jersey (17 PWSs) and California (67 PWSs) have far too few systems with Round 2 data based on this comparison. Therefore, to reduce potential analytical results bias, New Jersey, California, and seven other States were excluded from the analyses since a significant portion of PWSs in these States do not have contaminant occurrence data for Round 2.

Exhibit 3.3.b. also indicates States with data quality problems. The data from Louisiana, Pennsylvania, South Carolina, and Vermont were very problematic. For instance, 100% of the data reported by Louisiana (for a very large number of systems and samples) were non-

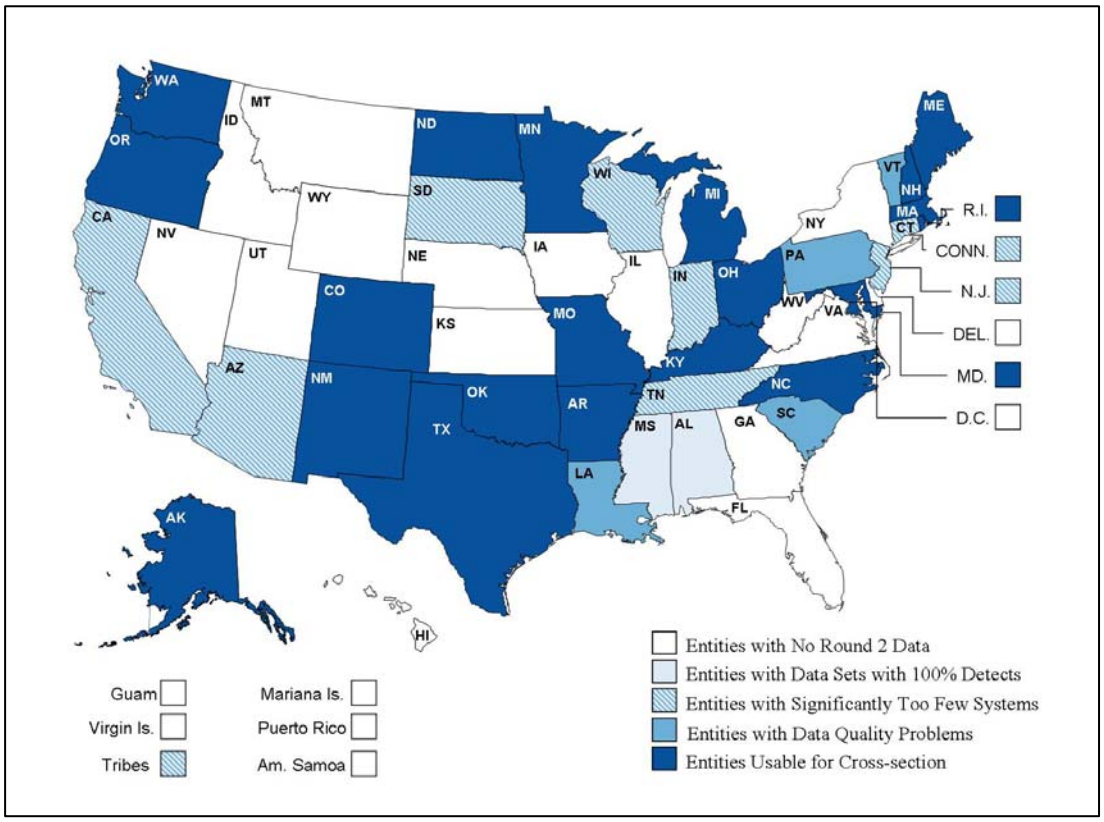
detections. There were no positive analytical findings of contaminant occurrence in the 164,492 sample results reported. Data from the other three States were very inconsistent (e.g., data for VOCs within a single State appeared to be reported in mixed units). The data from these four States were excluded from the analysis and are identified as "Data Quality Problems". The last category in Exhibit 3.3.b, "Entities Usable for Cross-section," identifies States with data records that are reasonably balanced and perhaps complete for the systems that did report. These 20 Round 2 primacy entities with adequate and unbiased data were further considered for occurrence analyses.

The next level of data evaluation assessed the analytical results for each State in even more detail. For example, the minimum, median, 99th percentile, and maximum analytical values were determined for every contaminant in each State. With this more in-depth level of analysis, some additional data quality problems were identified within the data sets of the 20 Round 2 cross-section States. Most of these problems were determined to be specific to certain contaminants (or contaminant groups). With additional data editing efforts, these problems have either been resolved or the problematic portion of data omitted from further analysis. For additional discussion of specific problems, refer to Section III.C of the *Priority Contaminants Report* (USEPA, 2002).

Exhibit 3.3.a. Summary of Round 2 Data Quantity and Quality for the States, Tribes and Territories

	State/ Tribes/ Territories	Total Unique PWSs	Percent Sample Detections	Samples per PWS
1	*Alabama*	314	94.08%	2
2	*Alaska*	625	3.10%	194
3	*American Samoa*	-		
4	*Arizona*	123	2.75%	55
5	*Arkansas*	577	7.29%	118
6	*California*	67	6.75%	44
7	*Colorado*	833	3.72%	143
8	*Connecticut*	87	4.53%	921
9	*Delaware*	-		
10	*Florida*	-		
11	*Georgia*	-		
12	*Guam*	-		
13	*Hawaii*	-		
14	*Idaho*	-		
15	*Illinois*	-		
16	*Indiana*	120	2.26%	58
17	*Iowa*	-		
18	*Kansas*	-		
19	*Kentucky*	445	7.50%	125
20	*Louisiana*	1,394	0.00%	118
21	*Maine*	745	0.89%	163
22	*Mariana Is.*	-		
23	*Maryland*	1,015	0.62%	140
24	*Massachusetts*	506	3.12%	125
25	*Michigan*	3,209	7.26%	97
26	*Minnesota*	1,581	1.66%	198
27	*Mississippi*	1,155	71.27%	4
28	*Missouri*	1,434	6.08%	109
29	*Montana*	-		
30	*Nebraska*	-		
31	*Nevada*	-		
32	*New Hampshire*	849	5.45%	23
33	*New Jersey*	17	2.32%	28
34	*New Mexico*	755	0.75%	277
35	*New York*	-		
36	*North Carolina*	2,263	2.05%	55
37	*North Dakota*	296	7.73%	59
38	*Ohio*	2,259	3.45%	291
39	*Oklahoma*	888	3.99%	180
40	*Oregon*	1,168	1.66%	75
41	*Pennsylvania*	1,424	10.32%	16
42	*Puerto Rico*	-		
43	*Rhode Island*	117	0.30%	136
44	*South Carolina*	1,047	0.33%	147
45	*South Dakota*	27	2.34%	40
46	*Tennessee*	78	9.31%	147
47	*Texas*	4,863	1.23%	124
48	*Tribes*	26	1.22%	57
49	*Utah*	-		
50	*Vermont*	636	2.65%	74
51	*Virgin Islands*	-		
52	*Virginia*	-		
53	*Washington*	2,680	2.23%	123
54	*Washington, D.C.*	-		
55	*West Virginia*	-		
56	*Wisconsin*	225	1.41%	51
57	*Wyoming*	-		
	TOTAL	33,848	2.95%	124

Exhibit 3.3.b. Summary of Round 2 Data Quantity and Quality for the States, Tribes and Territories



3.4 Data Characteristics Overview

A descriptive overview of the Round 2 data is presented in Exhibits 3.4.a through 3.4.d to provide additional insight and perspective on the results. As noted, after the initial data management and editing, 4.21 million records were available for analysis from more than 33,000 PWSs in the 35 States/entities. The Round 2 cross-section States total 3.69 million records from slightly more than 27,000 PWSs. These 20 States, therefore, contain nearly 88% of all available Round 2 State contaminant occurrence data.

Exhibit 3.4.a shows the number and percentage of sample records and systems according to source water type: approximately 89% of the systems in the 20-State cross-section are classified as ground water and 11% as surface water. These source water percentages are essentially the same for the entire data set using all 35 States/entities. The Round 2 data contains systems using GWUDI as a source definition. The classification used follows the regulatory guidelines: if a system uses any surface water (such as a GWUDI), it is classified as a surface water system.

Exhibit 3.4.a. Round 2 Data – Number of Records and Systems by Source Water Type

SOURCE TYPE	RECORDS		SYSTEMS	
	NUMBER	*PERCENT*	*NUMBER*	*PERCENT*
All States - Ground Water	3,479,102	82.6%	30,085	88.9%
All States - Surface Water	732,344	17.4%	3,763	11.1%
All States - Total	**4,211,446**	**100.0%**	**33,848**	**100.0%**
20 States - Ground Water	3,085,266	83.5%	24,199	89.3%
20 States - Surface Water	609,619	16.5%	2,909	10.7%
20 States - Total	**3,694,885**	**100.0%**	**27,108**	**100.0%**

Exhibit 3.4.b shows the number and percentage of records and systems by system type. Approximately 70% of systems in the 20-State cross-section were CWSs and 30% were NTNCWSs. The CWS percentage was slightly higher for the entire 35 States/entities data set, and the percentage for NTNC correspondingly lower. Systems coded as NCWSs (or transients) were excluded from these analyses.

Exhibit 3.4.b. Round 2 Data – Number of Records and Systems by System Type

SYSTEM TYPE	RECORDS		SYSTEMS	
	NUMBER	*PERCENT*	*NUMBER*	*PERCENT*
All States - CWS [1]	3,255,222	77.3%	24,357	72.0%
All States - NTNCWS [2]	956,224	22.7%	9,491	28.0%
All States - Total	**4,211,446**	**100.0%**	**33,848**	**100.0%**
20 States - CWS [1]	2,808,341	76.0%	19,055	70.3%
20 States - NTNCWS [2]	886,544	24.0%	8,053	29.7%
20 States - Total	**3,694,885**	**100.0%**	**27,108**	**100.0%**

1. CWS = Community Water System
2. NTNCWS = Non-Transient Non-Community Water System

Exhibits 3.4.c and 3.4.d show the distribution of data by years and by month (based on actual sample collection or analysis date). These tables only present the 20-State cross-section data. Exhibit 3.4.c indicates the amount of data annually collected during the 1993-1997 compliance cycle (including some 1992 "grandfathered" data). For Round 2 data from the 20-State cross-section, the total number of records ranged between 220,745 in 1992 and 823,587 in 1995, with an average of 615,814 records per year. In Exhibit 3.4.d, a fairly uniform distribution of occurrence data by month is shown, suggesting that there should be no inherent seasonal bias in the data. For the 20-State cross-section, the total number of records ranged between 259,787 (November) and 371,122 (March), with an average of 307,907 records per month. Trends were similar for the entire 35 States/entities data set as for the 20-State cross-section. For a more

detailed summary of these numbers, refer to Section III.D of the *Priority Contaminants Report* (USEPA, 2002).

Exhibit 3.4.c. Round 2 Data – Number of Records by Year and Source Water Type

YEAR	# SURFACE WATER RECORDS	# GROUND WATER RECORDS	TOTAL # OF RECORDS	% OF TOTAL RECORDS
20 States - 1992	33,187	187,558	220,745	6.0%
20 States - 1993	115,859	592,555	708,414	19.2%
20 States - 1994	105,673	504,410	610,083	16.5%
20 States - 1995	112,144	711,443	823,587	22.3%
20 States - 1996	136,182	589,788	725,970	19.6%
20 States - 1997	106,574	499,512	606,086	16.4%
20 States - Total	**609,619**	**3,085,266**	**3,694,885**	**100.0%**

Exhibit 3.4.d. Round 2 Data – Number of Records by Month and Source Water Type

MONTH	# SURFACE WATER RECORDS	# GROUND WATER RECORDS	TOTAL # OF RECORDS	% OF TOTAL RECORDS
20 States - January	40,939	221,420	262,359	7.1%
20 States - February	49,405	211,499	260,904	7.1%
20 States - March	65,525	305,597	371,122	10.0%
20 States - April	41,692	257,085	298,777	8.1%
20 States - May	44,374	245,051	289,425	7.8%
20 States - June	55,612	285,159	340,771	9.2%
20 States - July	44,174	262,611	306,785	8.3%
20 States - August	52,087	266,475	318,562	8.6%
20 States - September	65,814	293,692	359,506	9.7%
20 States - October	46,113	254,688	300,801	8.1%
20 States - November	46,492	213,295	259,787	7.0%
20 States - December	57,392	268,694	326,086	8.8%
20 States - Total	**609,619**	**3,085,266**	**3,694,885**	**100.0%**

The analytical findings of the 20-State Round 2 cross-section occurrence data for 1,3-dichloropropene, 1,1,2,2-tetrachlorethane, metolachlor are developed and summarized in Section 6 of this report.

4. National Inorganics And Radionuclides Survey (NIRS) Data

The EPA's National Inorganics and Radionuclides Survey occurrence data are assessed for one contaminant considered during CCL 2 Regulatory Determinations, boron, and are only applicable for PWSs served by ground water.

4.1 Description of Data

The NIRS survey was conducted by EPA specifically to provide data on the occurrence of a select set of radionuclides and IOCs being considered for NPDWRs. The NIRS provides contaminant occurrence data from 989 community water systems served by ground water sources. Each of these randomly selected PWSs was sampled a single time between 1984 and 1986. The selection of this group of PWSs was designed so that the contaminant occurrence results from these PWSs are representative of national occurrence of contaminants in ground water systems. Further description of the NIRS survey can be found in Longtin (1988).

The NIRS sample design included random selection of a number of systems from each size category in proportion to the number of PWSs in those size categories nationally. NIRS was structured as a stratified, random sampling of the nation's community ground water supplies as they existed in the mid-1980s. The stratification for sample selection was based on system size. However, the sampling frame used in NIRS was not specifically designed to be representative of ground water supplies on a State-by-State, regional, or other geographic basis. The resulting sample of systems represents approximately 2% of the nation's community ground water supply in each system size category. Therefore, since there are many more small than large PWSs in the US, most of the NIRS data are from smaller systems. In aggregate, approximately 95% of the analytical sample results in the entire NIRS database indicate no detections of the contaminants sampled and analyzed. The NIRS database includes information on 42 contaminants, including: 36 IOCs (including 10 regulated IOCs), 2 regulated radionuclides, and 4 unregulated radionuclides. The data are from 49 States (there are no data from Hawaii), as well as Puerto Rico. One contaminant from the NIRS is evaluated in this report: boron. Concentration values for boron are presented in milligrams per liter (mg/L), not micrograms per liter (µg/L).

4.2 Representativeness

By design, the data collected and contained in the NIRS database are nationally representative of ground water systems, and furthermore, can be divided into strata based on system size for additional statistical resolution. Especially when compared to the Round 1 and 2 databases, there are few contaminant occurrence data quality or completeness issues with the NIRS data set. The NIRS contains analytical results that were specifically collected to establish a nationally representative sample, so the sample is "complete and adequate" simply by correct implementation of the sample selection design. Also, there are often computational (statistical) problems resulting from multiple laboratory analytical detection limits that must be addressed in the analysis of occurrence data. In the case of NIRS (for the IOC being evaluated in this report) analytical methods with uniform detection limits were employed. Therefore, the extensive concerns and problems with data quality, completeness, and representativeness encountered in the use of Round 1 or 2 data are not issues when considering the use of the NIRS data.

4.3 Data Characteristics Overview

A descriptive overview of the data is presented in two tables to provide additional insight and perspective on the results. Summary results for all States are included in the following results tables. For more descriptive information on the NIRS data characteristics, refer to Section IV.C of the *Priority Contaminants Report* (USEPA, 2002).

Exhibits 4.3.a and 4.3.b show the distribution of data by years and by month across all years. The data were collected between 1984 and 1986, with a peak of data collection in 1985. Somewhat more samples were collected in 1985, and a somewhat larger proportion of samples was collected in the fall months of September, October, and November (though seasonal effects for the occurrence of IOCs in groundwater is likely not high). The analytical findings of the occurrence data for boron are developed and summarized in Section 6.3 of this report.

Exhibit 4.3.a. NIRS Data – Number of Records by Year

YEAR	# OF RECORDS	% OF TOTAL RECORDS
1984	268	27.1%
1985	466	47.1%
1986	255	25.8%
Total	**989**	**100.0%**

Exhibit 4.3.b. NIRS Data – Number of Records by Month

MONTH	# OF RECORDS	% OF TOTAL RECORDS
January	19	1.9%
February	29	2.9%
March	63	6.4%
April	92	9.3%
May	70	7.1%
June	68	6.9%
July	92	9.3%
August	94	9.5%
September	118	11.9%
October	153	15.5%
November	132	13.3%
December	59	6.0%
Total	**989**	**100.0%**

4.4 Supplemental IOC Data

Efforts were made to identify data sources from surface water systems to supplement the ground water data in the NIRS data. Boron was not monitored in either the UCM or UCMR. To gain a better understanding of the potential occurrence of boron in surface water systems, EPA evaluated a report funded by the American Water Works Association Research Foundation (Frey *et al.*, 2004). The AWWARF study recruited 189 PWSs representing 407 source waters that covered 41 states. Of these 407 PWS source water samples, 342 were returned and 341 were analyzed for boron. Of these 341 samples, approximately 67% (or 228) represented ground water sources and 33% (or 113) represented surface water sources. None of the 113 surface water sources exceeded the boron HRL of 1.4 mg/L and the maximum concentration observed in surface water was 0.345 mg/L. Extrapolation of the data indicates that 95% of the ground water detections had boron levels less than 1.054 mg/L; the maximum observed concentration in ground water was approximately 3.3 mg/L. Seven of the 228 ground water sources (from 5 systems) had boron concentrations greater than 1.4 mg/L (Seidel, 2006).

5. Developing a Nationally Representative Perspective

As discussed in previous sections of this report, the Round 1 and Round 2 databases contain contaminant occurrence data from a total of 40 and 35 States/entities, respectively. However, data from many of these States are incomplete, problematic, and/or biased. An evaluation of these data suggested that data from certain States were most complete and might, therefore, be used to generate summary statistics indicative of national contaminant occurrence. The representativeness of the State data was evaluated across a range of potential contaminant occurrence and across the spatial/hydrologic diversity of the nation. Based on these assessments, a cross-section of States was developed for each database to provide a reasonable indication of national occurrence.

The approach used for the construction of the cross-sections in this analysis was originally developed for the CMR report (USEPA, 1999). The approach to establish national cross-sections from State SDWA contaminant databases was supported by peer reviewers and by stakeholders as providing a clear, replicable, and understandable approach. Although this approach cannot provide a statistically representative sample (since the data could not be selected in a statistically random manner), the resultant data provide a clear indication of the central tendency of national occurrence. The methods by which the national cross-section was developed and tested for representativeness will be summarized in this report in a condensed form. For a detailed description of the methods used to develop the nationally-representative cross-sections, see Section V of the *Priority Contaminants Report* (USEPA, 2002).

States selected for the national cross-section were evaluated along two main criteria. First, the States had to provide the best data quality and completeness. Evaluation of this criterion has been discussed previously in this report. Second, the States had to provide a balanced national cross-section of occurrence data, requiring them to be representative of other characteristics as well. Determination of cross-sectional balance was based on evaluating the States' pollution potential and geographic coverage in relation to all States. Pollution potential was included to ensure the selection of states that represent the range of likely contaminant occurrence and a balance with regard to likely high and low occurrence. Geographic consideration was included so that the wide range of climatic and hydrogeologic conditions across the United States would be represented, again balancing the varied conditions that affect transport and fate of contaminants. Two primary indicators were chosen to represent pollution potential in each State: the number of manufacturing establishments per square mile, and the total farm agricultural chemical expenses. Sources of information for the first indicator were the *1995 Annual Survey of Manufactures* (USDOC, 1997) and the *1992 Census of Manufactures* (USDOC, 1996), while data for the second indicator was taken from the *1992 Census of Agriculture* (USDOC, 1994).

The states were divided into quartiles based on their pollution potential rankings for the two indicators, and the cross-section states were chosen to ensure equitable representation from each quartile. In addition, some secondary pollution potential indicators were considered to further ensure that the cross-section states included the spectrum of pollution potential conditions (high to low). At the same time, care was taken to ensure that the cross-section provided representative coverage across all geographic regions of the United States.

The product of the data quality screening, pollution potential rankings, and geographic coverage analysis was a national cross-section of 24 Round 1 states and a national cross-section of 20 Round 2 states (see Exhibit 5.a-b). The Round 1 24-State cross-section includes about 49% of the PWSs nationally and about 56% of the population served by PWSs. By comparison, the Round 2 20-State cross-section includes more than 41% of the PWSs nationally and about 34% of the population served by PWSs. In each case, the cross-section states provide good representation of the nation's varied climatic and hydrogeologic regimes and the breadth of pollution potential for the contaminant groups.

To assess the representativeness of the Round 1 24-State cross-section, and the cross-section methodology in general, cross-sections of 4, 8, and 13 States were developed and contaminant statistics for each cross-section were compared to the 24-State cross section. These statistics were also compared to contaminant statistics derived from cross-sections including biased data. Following this comparison, the 24-State cross-section appeared to be a successful balance between the problems associated with too little data (unrepresentative sampling) and those associated with too much data (including "bad" or biased data). Consequently, although they are not "statistically representative," both the 20- and 24-State cross-sections were used for further analyses of occurrence data. For more information on the construction and validation of both the Round 1 and Round 2 cross-sections, see Section V of the *Priority Contaminants Report* (USEPA, 2002).

Exhibit 5.a. 24 Round 1 Cross-Section States and States Not Included in the Cross-Section

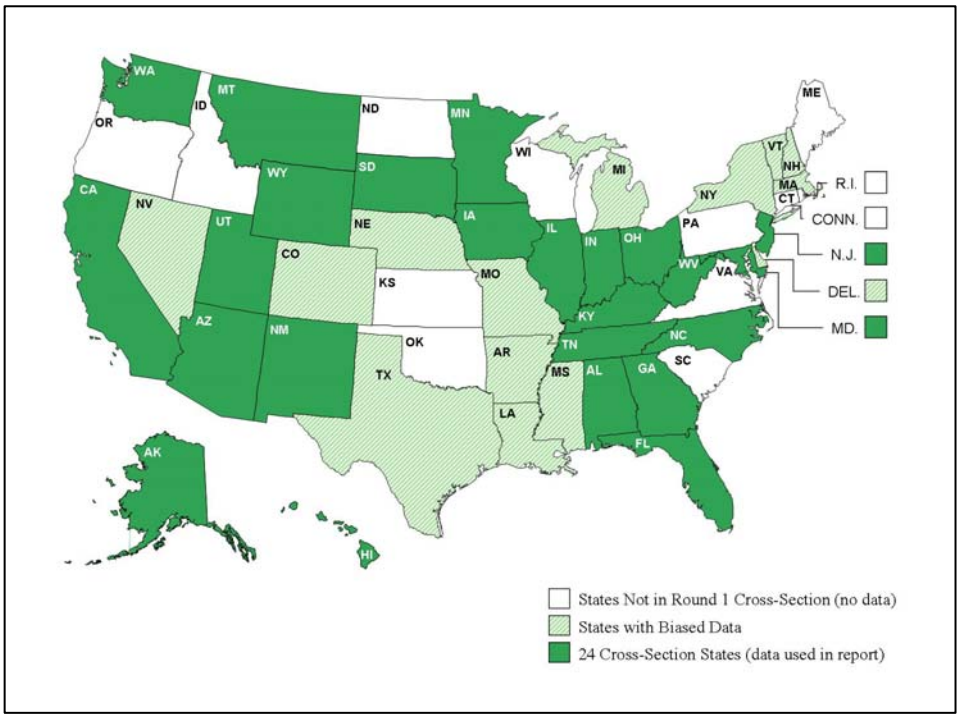
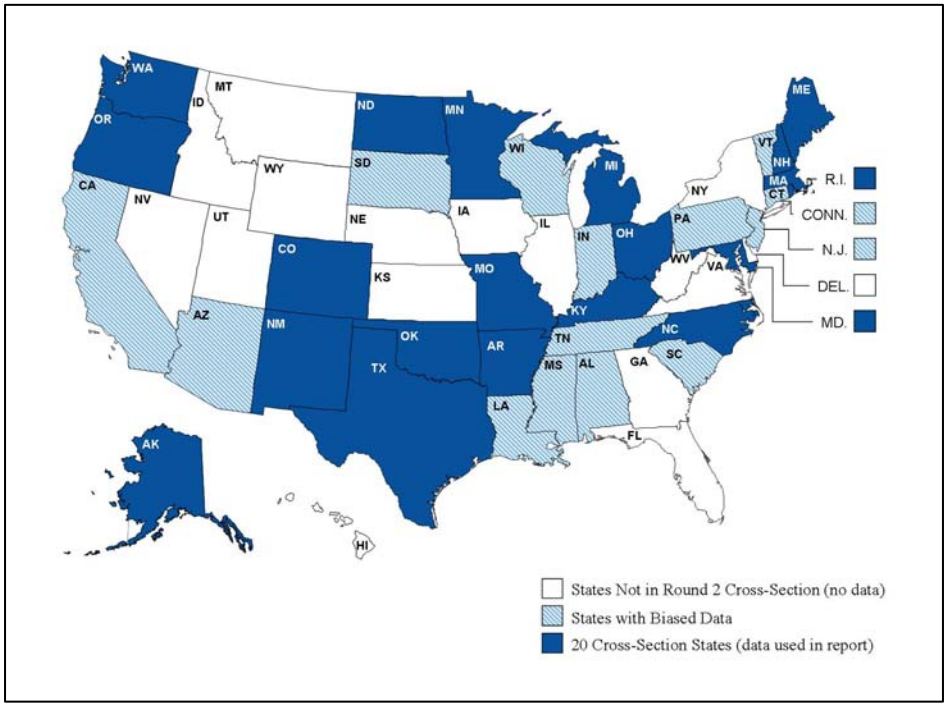


Exhibit 5.b. 20 Round 2 Cross-Section States and States Not Included in the Cross-Section



6. Analysis of National Occurrence

This section of the report contains detailed occurrence assessments of four contaminants considered during CCL 2 Regulatory Determinations: data for 1,3-dichloropropene and 1,1,2,2-tetrachloroethane are found in the Round 1 and Round 2 databases, data for metolachlor are found in the Round 2 database, and data for boron are found in the NIRS database. In the following section (Section 7), a series of graphs and maps are presented as a complimentary graphical evaluation of the occurrence of these four contaminants.

The summary data developed for the occurrence assessments are presented in detail in Appendices B through E. Appendix B contains analyses of the two Round 1 contaminants. Appendix C contains analyses of the three Round 2 contaminants. Appendix D presents an analysis of the NIRS data for boron. Detailed summaries of all four contaminants are presented in Appendix E. At the beginning of the Appendices section, a complete "List of Appendix Tables" identifies all tables included in the four appendices. Also included are "Notes to Accompany Unregulated Contaminant Occurrence Data Tables" which presents definitions of terms and phrases commonly used in the many tables, graphs, and maps included in this report and its appendices.

6.1 Round 1 Contaminant Occurrence

Exhibits 6.1.a and 6.1.b summarize the Round 1 24-State cross-section occurrence data for 1,3-dichloropropene and 1,1,2,2-tetrachloroethane. For both 1,3-dichloropropene and 1,1,2,2-tetrachloroethane, less than 1% of PWSs in the cross-section States have analytical detections in the Round 1 database. Approximately 2% of the population served by PWSs had analytical detections of 1,1,2,2-tetrachloroethane while less than 1% of the population served by PWSs had detections of 1,3-dichloropropene. While detection frequencies of both contaminants suggest very low levels of national occurrence, both contaminants also were found more frequently in surface water PWSs than ground water PWSs. This pattern is found at both the detection (≥ MRL) and threshold (> HRL) level.

Nevertheless, the low percentage of systems with at least one sample analytical result exceeding the HRL (< 0.6% for both contaminants in surface water) suggests that both contaminants are only very rarely found in concentrations surpassing the defined health-based thresholds. Because much of the 1,1,2,2-tetrachloroethane and 1,3-dichloropropene occurrence data were generated using laboratory methods with MRLs higher than the respective HRLs and ½ HRLs, it is likely that occurrence analyses did not identify some HRL and ½ HRL exceedances at the participating systems. Given this, the analyses may potentially underestimate actual 1,1,2,2-tetrachloroethane and 1,3-dichloropropene occurrence relative to their respective HRLs and ½ HRLs. Although many of the MRLs used in the cross-section for 1,3-dichloropropene and 1,1,2,2-tetrachloroethane were higher than the HRL, all MRLs did fall within (or below) the risk range of 10^{-6} to 10^{-4} used by EPA to evaluate carcinogens. A complete presentation of the occurrence data for the two contaminants considered during CCL 2 Regulatory Determinations in Round 1 is provided in Appendix B.

Exhibit 6.1.a. Round 1 Data – 24-State Cross-Section Summary of System-Level Occurrence for Contaminants Considered During CCL 2 Regulatory Determinations

CHEMICAL NAME (HRL in μg/L)	# of PWSs			% PWSs ≥ MRL			% PWSs > HRL			99th Percentile Value (μg/L)
	Total	GW	SW	Total	GW	SW	Total	GW	SW	
VOCs										
1,3-Dichloropropene (HRL=0.4)	9,164	8,303	898	0.16%	0.12%	0.56%	0.16%	0.12%	0.56%	< MRL
1,1,2,2-Tetrachloroethane (HRL=0.4)	20,407	18,693	1,867	0.45%	0.39%	1.02%	0.20%	0.17%	0.48%	< MRL

PWS = Public Water System; GW = Ground Water; SW = Surface Water; MRL = Minimum Reporting Limit (for laboratory analyses); HRL = Health Reference Level (concentration values used only as reference levels for analyses in this report). "% PWSs > HRL" indicates the proportion of systems with any analytical results exceeding the concentration value of the HRL. 99th Percentile Value = the 99th percentile of all samples, not just detects.

Exhibit 6.1.b. Round 1 Data – 24-State Cross-Section Summary of Population Served-Level Occurrence for Contaminants Considered During CCL 2 Regulatory Determinations

CHEMICAL NAME (HRL in μg/L)	Total Population Served by PWSs			% Population Served by PWSs ≥ MRL			% Population Served by PWSs > HRL		
	Total	GW	SW	Total	GW	SW	Total	GW	SW
VOCs									
1,3-Dichloropropene (HRL=0.4)	50,917,006	24,660,968	29,271,833	0.86%	0.59%	0.99%	0.86%	0.59%	0.99%
1,1,2,2-Tetrachloroethane (HRL=0.4)	94,710,065	55,763,644	43,763,942	1.86%	1.82%	1.70%	1.63%	1.53%	1.58%

PWS = Public Water System; GW = Ground Water; SW = Surface Water; MRL = Minimum Reporting Limit (for laboratory analyses); HRL = Health Reference Level (concentration values used only as reference levels for analyses in this report). "% Population Served by PWSs > HRL" indicates the proportion of population served by systems with any analytical results exceeding the concentration value of the HRL.

6.2 Round 2 Contaminant Occurrence

The Round 2 20-state cross-section data are discussed in Section 5 of this report, and are identified in Exhibit 5.b. Exhibit 6.2.a summarizes the Round 2 20-state cross-section occurrence data for metolachlor, 1,3-dichloropropene, and 1,1,2,2-tetrachloroethane. For all three contaminants, less than 1% of public water systems in the cross-section States have analytical detections. Analytical detections of 1,1,2,2-tetrachloroethane are found in less than 0.1% of PWSs, suggesting very low levels of national occurrence for this contaminant. However, based on the percentage of population served by systems, almost 12% of the population served by

PWSs had detections of metolachlor, less than 1% of the population served by PWSs had detections of 1,3-dichloropropene, and slightly more than 2.5% of the population served by PWSs had detections of 1,1,2,2-tetrachloroethane. The percent of systems with at least one sample analytical result greater than the HRL for 1,3-dichloropropene and 1,1,2,2-tetrachloroethane is less than 0.25%, suggesting that these contaminants are only very rarely found in concentrations surpassing the defined HRL. No PWSs had any analytical results of metolachlor greater than the HRL of 70 µg/L**.** Appendix C contains complete occurrence summaries for these three contaminants contained in Round 2 data.

Exhibit 6.2.a. Round 2 Data – 20-State Cross-Section Summary of System-Level Occurrence for Contaminants Considered During CCL 2 Regulatory Determinations

CHEMICAL NAME (HRL in µg/L)	# of PWSs			% PWSs ≥ MRL			% PWSs > HRL			99th Percentile Value (µg/L)
	Total	GW	SW	Total	GW	SW	Total	GW	SW	
SOCs										
Metolachlor[1] (HRL=70)	12,953	11,503	1,450	0.83%	0.11%	6.55%	0.00%	0.00%	0.00%	< MRL
VOCs										
1,3-Dichloropropene (HRL=0.4)	16,787	15,178	1,609	0.35%	0.32%	0.62%	0.23%	0.19%	0.56%	< MRL
1,1,2,2-Tetrachloroethane (HRL=0.4)	24,800	22,106	2,694	0.08%	0.05%	0.30%	0.07%	0.05%	0.22%	< MRL

1. Massachusetts data not included in summary statistics for this contaminant.

PWS = Public Water System; GW = Ground Water; SW = Surface Water; MRL = Minimum Reporting Limit (for laboratory analyses); HRL = Health Reference Level (concentration values used only as reference levels for analyses in this report). "% PWSs > HRL" indicates the proportion of systems with any analytical results exceeding the concentration value of the HRL. 99th Percentile Value = the 99th percentile of all samples, not just those with detections.

Exhibit 6.2.b. Round 2 Data – 20-State Cross-Section Summary of Population Served-Level Occurrence for Contaminants Considered During CCL 2 Regulatory Determinations

CHEMICAL NAME (HRL in μg/L)	Total Population Served by PWSs			% Population Served by PWSs ≥ MRL			% Population Served by PWSs > HRL		
	Total	GW	SW	Total	GW	SW	Total	GW	SW
SOCs									
Metolachlor[1] (HRL=70)	47,098,573	14,279,627	32,818,946	11.58%	0.70%	16.31%	0.00%	0.00%	0.00%
VOCs									
1,3-Dichloropropene (HRL=0.4)	45,951,052	17,423,030	28,528,022	0.55%	1.13%	0.19%	0.33%	0.57%	0.18%
1,1,2,2-Tetrachloroethane (HRL=0.4)	71,294,263	25,978,359	45,315,904	2.61%	0.09%	4.06%	0.08%	0.09%	0.07%

1. Massachusetts data not included in summary statistics for this contaminant.

PWS = Public Water System; GW = Ground Water; SW = Surface Water; MRL = Minimum Reporting Limit (for laboratory analyses); HRL = Health Reference Level (concentration values used only as reference levels for analyses in this report). "% Population Served by PWSs > HRL" indicates the proportion of systems with any analytical results exceeding the concentration value of the HRL.

6.3 NIRS Contaminant Occurrence

The NIRS data are discussed in Section 4 of this report. Exhibit 6.3.a summarizes the occurrence data of the NIRS (for ground water systems only) for boron. Nearly 82% of public water system, serving 88% of the population served, had analytical detections of boron. This is consistent with the known widespread natural occurrence of boron in soil and minerals. The percentage of systems with at least one sample analytical result greater than the HRL (1.7%) is higher than the other contaminants analyzed, again indicating boron's widespread nature. (Note that these results are for ground water systems only, and that the NIRS survey was designed to provide statistically valid results for ground water systems nationally.) Appendix D summarizes the NIRS data coverage for boron.

Since the NIRS data were collected from a select group of nationally representative public water systems (served by ground water), the percentage of samples (or systems) exceeding various thresholds are also estimates of national occurrence. For example, since 1.7% of NIRS systems sampled for boron have detections greater than the HRL (of 1.4 mg/L), it can be concluded that approximately 1.7% of ground water systems sampled nationally for boron will also have detections greater than the specified HRL. Furthermore, it can be concluded that approximately 0.4% of the population served by ground water systems sampled nationally for boron will also have detections greater than the specified HRL.

Exhibit 6.3.a. NIRS Data – Summary of Boron Occurrence in Surveyed Ground Water Systems - Based on the System Level

CHEMICAL NAME (HRL in mg/L)	Total No. PWS	Percent PWS ≥ MRL	Percent PWS > ½ HRL	Percent PWS > HRL	99th Percentile Value (mg/L)
Inorganic Chemicals					
Boron (HRL=1.4)	989	81.90%	4.32%	1.72%	2.44

PWS = Public Water System; MRL = Minimum Reporting Limit (for laboratory analyses); HRL = Health Reference Level (concentration values used only as reference levels for analyses in this report). 99th Percentile Value = the 99th percentile of all samples, not just those with detections.

Exhibit 6.3.b. NIRS Data – Summary of Boron Occurrence in Surveyed Ground Water Systems - Based on Population Served

CHEMICAL NAME (HRL in mg/L)	Total Population Served by PWSs	% Population Served by PWSs ≥ MRL	% Population Served by PWS > ½ HRL	% Population Served by PWS > HRL
Inorganic Chemicals				
Boron (HRL=1.4)	1,482,153	88.10%	2.90%	0.40%

PWS = Public Water System; MRL = Minimum Reporting Limit (for laboratory analyses); HRL = Health Reference Level (concentration values used only as reference levels for analyses in this report).

6.4 National Extrapolation of Stage 1 Occurrence Measures

As stated earlier, both the Round 1 and Round 2 cross-sections, as well as the NIRS database, were developed to be nationally representative. National estimates of the contaminant occurrence data can be generated via extrapolations. Exhibit 6.4 presents the national extrapolations of the Stage 1 occurrence measures from the UCM Rounds 1 and 2 cross-sections and the NIRS data. These national extrapolations were calculated by multiplying the percentages of systems (or population served by systems) with threshold exceedances (presented in Exhibits 6.1.a through 6.3.b) by the number of systems and population served by systems nationally (presented in Exhibit 1.51).

Exhibit 6.4. National Extrapolation of Stage 1 Occurrence Measures

Chemical Name (HRL)	Source Water Type	Detections (≥ MRL)		Detections > ½ HRL		Detections > HRL	
		Systems	Population Served	Systems	Population Served	Systems	Population Served
National Extrapolation of Round 1 24-State Cross-Section Data							
1,3-Dichloropropene (0.4 µg/L)	GW	72	508,000	72	508,000	72	508,000
	SW	31	1,262,000	31	1,262,000	31	1,262,000
	Total	106	1,825,000	106	1,825,000	106	1,825,000
1,1,2,2-Tetrachloroethane (0.4 µg/L)	GW	229	1,564,000	105	1,329,000	102	1,309,000
	SW	57	2,166,000	33	2,131,000	27	2,013,000
	Total	290	3,963,000	140	3,592,000	131	3,472,000
National Extrapolation of Round 2 20-State Cross-Section Data							
Metolachlor (70 µg/L)	GW	67	596,000	0.00%	0.00%	0.00%	0.00%
	SW	366	20,769,000	0.00%	0.00%	0.00%	0.00%
	Total	542	24,660,000	0.00%	0.00%	0.00%	0.00%
1,3-Dichloropropene (0.4 µg/L)	GW	188	969,000	161	695,000	114	492,000
	SW	35	248,000	31	230,000	31	230,000
	Total	225	1,171,000	194	894,000	147	703,000
1,1,2,2-Tetrachloroethane (0.4 µg/L)	GW	30	80,000	30	80,000	30	80,000
	SW	17	5,164,000	15	950,000	12	90,000
	Total	50	5,563,000	47	1,082,000	45	168,000
National Extrapolation of NIRS Data							
Boron (1.4 mg/L)	GW (only)	48,682	75,501,000	2,584	2,469,000	1,022	372,000

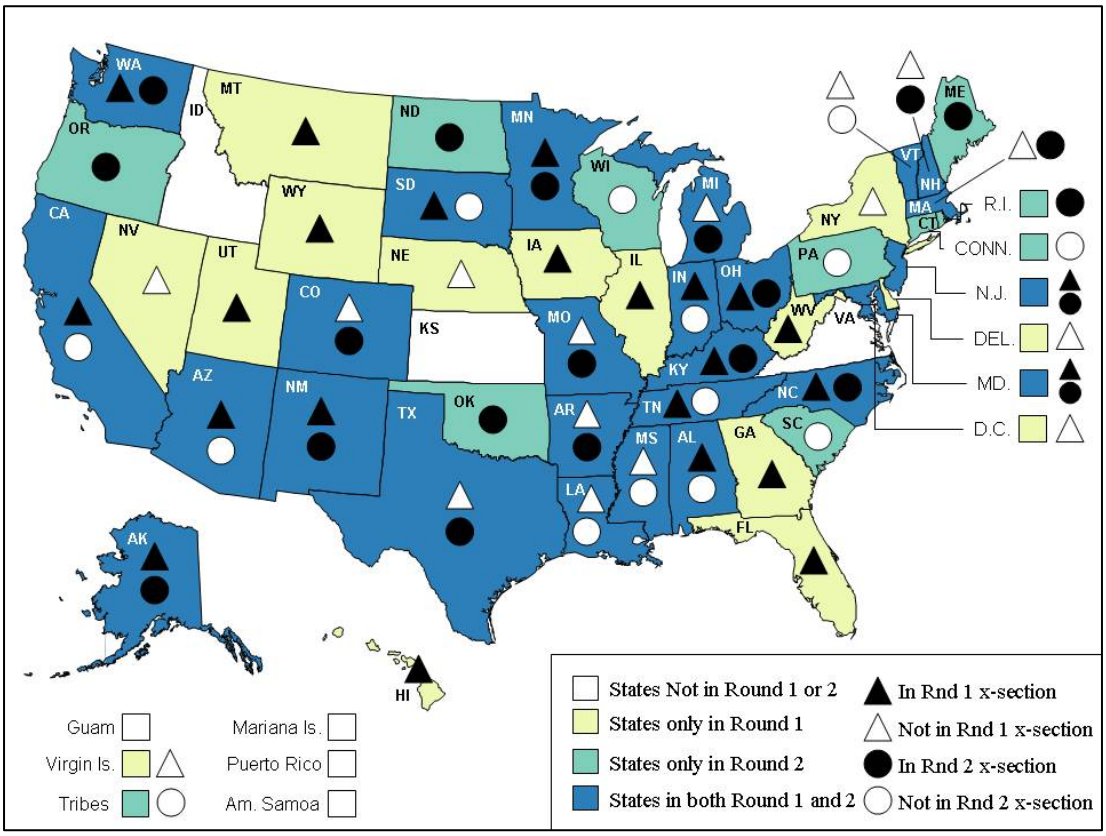
6.5 Comparing Data Coverage of Round 1 and Round 2

The Round 1 and Round 2 data were evaluated to determine if comparable States, public water systems, and contaminants are contained in both databases. As previously noted, Round 1 consisted of data from 40 States/territories and Round 2 consisted of data from 35 States/territories.

Exhibit 6.4 illustrates the States in Round 1 and 2, identifying the States common to both. Although 25 States are common to both Rounds 1 and 2, most of these States could not be considered for this analysis because of data quality issues (see Exhibit 2.3.a and Exhibit 3.3.a). Many States reported analytical results from a very low proportion of systems, reported results in mixed units, and/or reported only analytical detections (highly censored reporting) in Round 1 and/or Round 2.

Of the 25 States in both Round 1 and 2 (identified in Exhibit 6.4), only eight were determined to be sufficiently complete for use in this comparison analysis. Alaska, Kentucky, Maryland, Minnesota, North Carolina, New Mexico, Ohio, and Washington were contained in both databases and have data of adequate quality for analyses and comparisons.

Exhibit 6.5. States Common to Both Round 1 and Round 2, and Respective Cross-Sections



In addition to the States that have data in both the Round 1 and Round 2 databases, a determination was made regarding actual PWSs that are common to both databases. Thirty-one percent of all PWSs in Round 1 are also in Round 2, while only 22% of all Round 2 PWSs are common to both rounds. This is, in part, because there are many more systems reporting analytical results in Round 2 than in Round 1.

Michigan, for example, has only 139 systems in Round 1, and 123 of those systems (88%) are also in Round 2. In Round 2, Michigan has a total of 3,209 systems. Of these Round 2 systems, 123 (approximately 4%) are in Round 1. The number of PWSs in Alaska is problematic because the PWSIDs from Round 1 do not match the PWSIDs in Round 2. A few States do have a higher percentage of systems common to both rounds. Kentucky, Maryland, Minnesota, New Mexico, and Ohio each have over 70% of their total number of systems common to both Round 1 and Round 2. Coincidently, these are five of the States used for the comparison of occurrence data in States common in Round 1 and Round 2, which makes this analysis more representative

for comparison of the States for each contaminant. For specific numbers associated with each State, refer to Section IV.D of the *Priority Contaminants Report* (USEPA, 2002).

Comparisons of contaminants in Round 1 and Round 2 indicated that there were no common IOCs (Group 1) or SOCs (Regulated or Group 2) reported in both databases. In contrast, all of the unregulated Group 3 and Group 4 VOCs reported in Round 2 were also reported in Round 1. None of the regulated VOCs reported in Round 1, however, were reported in Round 2. Summary data for the two VOCs considered during CCL 2 Regulatory Determinations (1,3-dichloropropene and 1,1,2,2-tetrachloroethane) common to both Round 1 and Round 2 are presented in Appendix E (Tables E.3 and E.4) and comparisons between the rounds can be made. Further comparisons, in graphical form, are presented in Sections 7.2 and 7.3 of this report.

7. Graphical and Spatial Assessments of the Contaminants Considered During CCL 2 Regulatory Determinations

This section presents graphical assessments of the contaminants considered during CCL 2 Regulatory Determinations with data in the Round 1 and Round 2 cross-section States. Most of the Section 7 exhibits (maps and graphs) present analytical results based on these cross-section States. Some exhibits (discussed below) use additional State data to increase spatial coverage. The occurrence data used for all of the following maps and graphs are found in the occurrence summary tables in Appendix B and Appendix C of this report.

The development of the nationally representative cross-sections is an important aspect of the Round 1 and Round 2 data that must be considered as part of any conclusions drawn from the maps and graphs in this report. This development was discussed for Round 1 and Round 2 data in Section 5. The national cross-sections are developed from PWSs' contaminant monitoring data with the intent that, in aggregate, the cross-section States' occurrence findings are indicative of national occurrence. (Various occurrence comparisons between the Round 1 and Round 2 data, as well as comparisons to other State data sets, indicate that these cross-section States do provide contaminant occurrence data that are reasonable indications of national occurrence.)

Although sub-national occurrence findings, such as regional or multi-State occurrence patterns, can be useful for these initial assessments, any regional occurrence patterns (or absence of patterns) should be considered in the context of the source and coverage of the State cross-section data. With half (or more) of the States excluded from the cross-sections because they lack adequate data, regional patterns may be difficult to characterize and must be interpreted with caution. Supplemental information should be collected and used, whenever possible, to assist in evaluating the significance of any apparent regional patterns. For example, when assessing a particular pesticide occurrence pattern in this report, supplemental State or regional pesticide-use information could be reviewed to determine how the possible absence of a pesticide high-use State might affect interpretation of any occurrence pattern in the cross-section State maps.

The NIRS, designed to provide a single national occurrence assessment, is based on significantly less data than that provided by the Round 1 or Round 2 databases. Also, the NIRS data reflect a single sample per system (in contrast to 5 or 6 years of monitoring data from systems in the Round 1 and Round 2 databases). The NIRS survey results should only be reviewed in aggregate (i.e., at the national level and not at any regional or State level); therefore, no maps or graphs using the NIRS data for boron are included.

Most of the exhibits below that illustrate distribution of occurrence are based on non-biased data; for these exhibits only the cross-section State data are used to develop the maps and graphs. However, to increase the spatial coverage of the exhibits that broadly identify contaminant occurrence (Exhibits 7.1.a, 7.2.a, and 7.3.a), *all* data from *all* States with data in Round 1 and Round 2 are used. Therefore, in these exhibits the data from non-cross-section States (i.e., States with limited or biased data) are included, in addition to data from the cross-section States. This more extensive use of the data in the databases can be appropriate when a simple 'yes or no' identification of States with *any* PWS contaminant detection is of interest.

7.1 Metolachlor

There are only Round 2 occurrence data for metolachlor. Based on these data, metolachlor appears to occur throughout the United States, especially in the eastern half of the country. Fifteen of the 24 States with metolachlor data in Round 2 had at least one public water system with at least one analytical detection of this contaminant (see Exhibit 7.1.a, which includes all States, both cross-section and non-cross-section States, from the Round 2 database). In Exhibit 7.1.b, occurrence relative to the MRL is presented for only the Round 2 cross-section States. There is no apparent geographic trend among the States with the highest proportion of analytical detections of metolachlor. The State s with the highest percentage (between 10.1% and 20%) of metolachlor analytical detections are Kentucky and Rhode Island. No States had any analytical results of metolachlor greater than the HRL. Although occurrence is relatively widespread, the degree of occurrence (as measured by concentration) appears low.

Exhibit 7.1.a. Geographic Distribution of Metolachlor Detections in Both Cross-Section and Non-Cross-Section States (Round 2 Data)

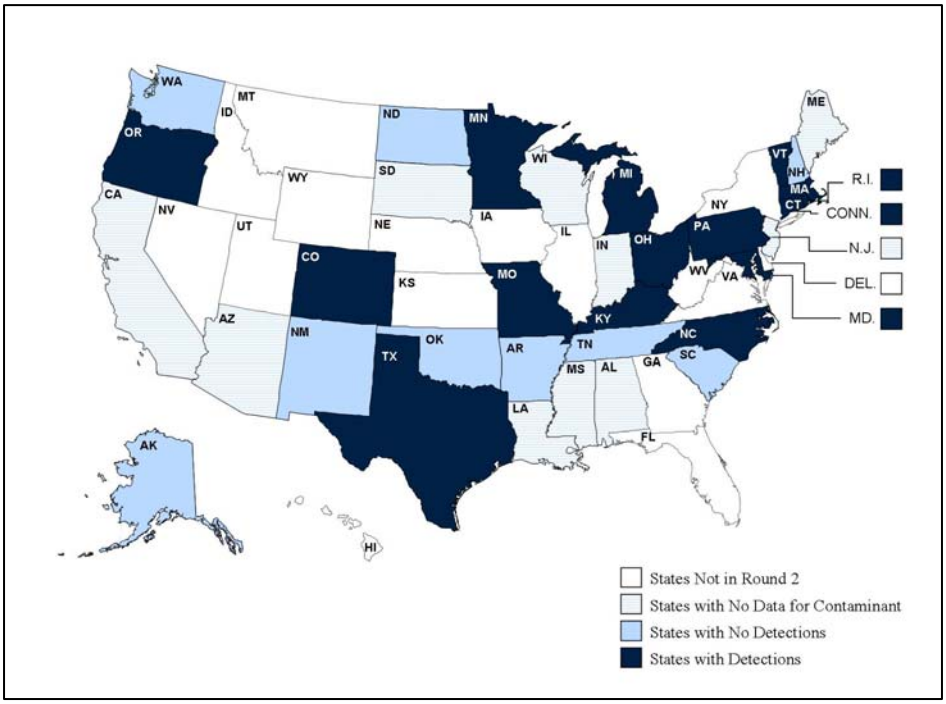
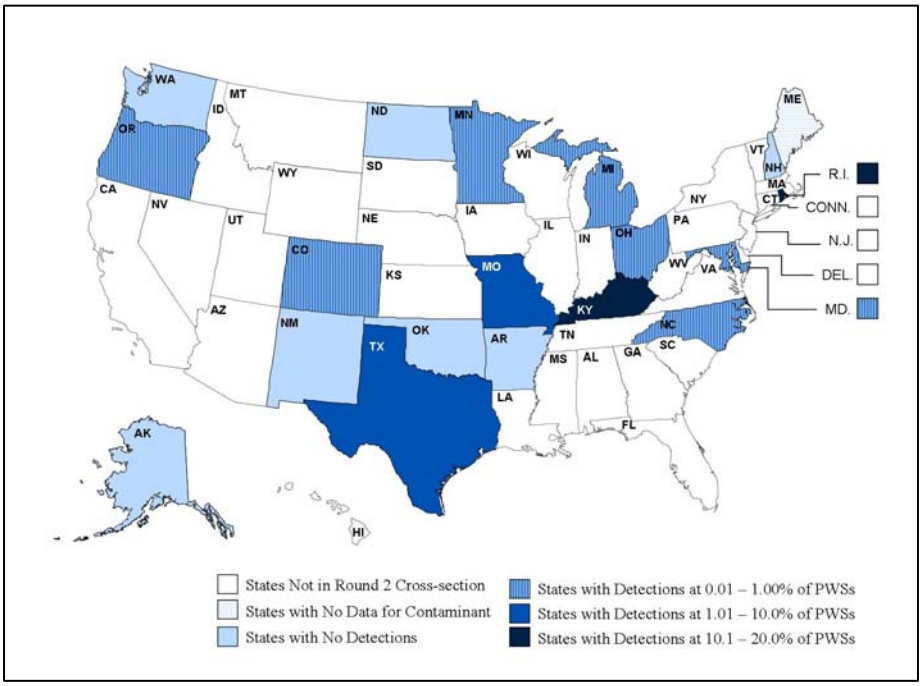
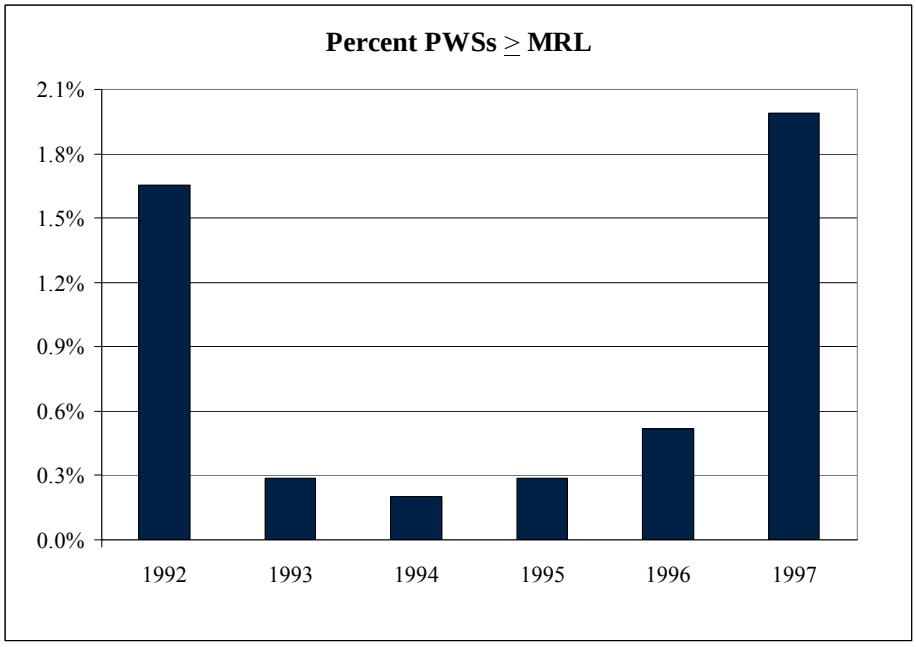


Exhibit 7.1.b. Geographic Distribution of Metolachlor Detection Frequencies in Cross-Section States (Round 2 Data)



Metolachlor occurrence over time, relative to the MRL, is presented in Exhibit 7.1.c. Based on these data, the highest percentage of PWSs had analytical detections of metolachlor equal to or greater than the MRL in 1992 and 1997. Note: Significantly fewer PWSs collected metolachlor data in 1992, as compared to subsequent years; however, there were about the same number of PWSs with detections in 1992 as in other years, causing an elevated percentage of PWSs with metolachlor detections for 1992. A much smaller percentage of PWSs had analytical detections of metolachlor in 1993 through 1996. The increased percentage of PWSs with metolachlor detections in 1997 could be due to the increased use of metolachlor between 1992 and 1997. According to the National Center for Food and Agricultural Policy (NCFAP), around 1992 approximately 59.4 million pounds of metolachlor active ingredient (a.i.) were applied annually to 16 types of crops on 32.4 million acres, and around 1997 approximately 67.3 million pounds of metolachlor a.i. were applied annually to 21 types of crops on 36.7 million acres (NCFAP, 2004 as cited in Chapter 13 of USEPA, 2006b).

Exhibit 7.1.c. Annual Frequency of Metolachlor Detections By Year (1992-1997) from the 19-State Round 2 Cross-Section



7.2 1,3-Dichloropropene

There are 1,3-dichloropropene occurrence data in both Round 1 and Round 2. Based on these data, the States with detections of 1,3-dichloropropene are widely distributed across the United States (see Exhibit 7.2.a, which includes all States, both cross-section and non-cross-section States, from both the Round 1 and 2 databases). Fourteen of the 37 States with 1,3-dichloropropene data in Round 1 and Round 2 had at least one public water system with at least one analytical detection. In Exhibit 7.2.b, occurrence relative to the MRL is presented for the Round 1 cross-section States in the left map and the Round 2 cross-section States in the right map. Utah and Minnesota have a higher percentage of 1,3-dichloropropene detections (between 1% and 3%) relative to other States.

Exhibit 7.2.a. Geographic Distribution of 1,3-Dichloropropene Detections in Both Cross-Section and Non-Cross-Section States (Combined Rounds 1 and 2)

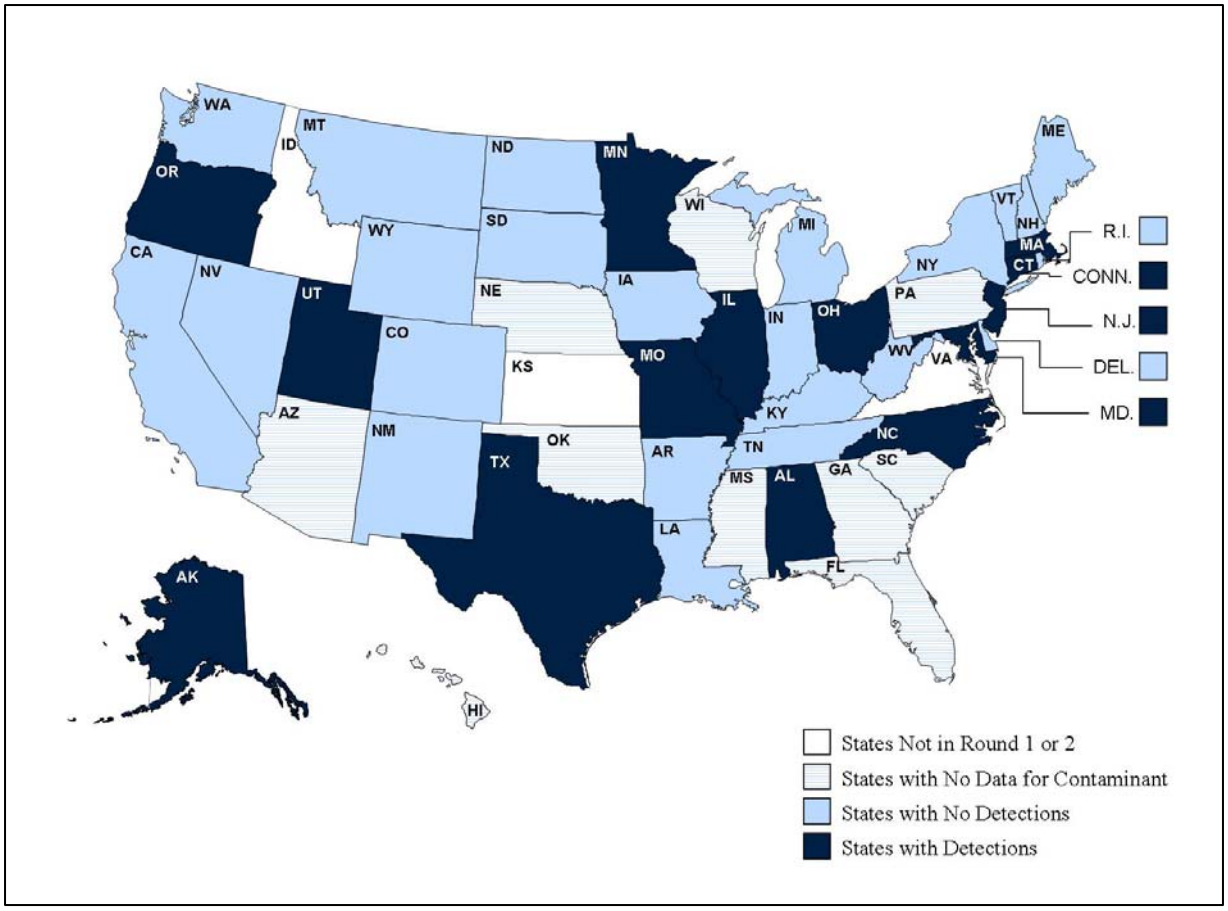
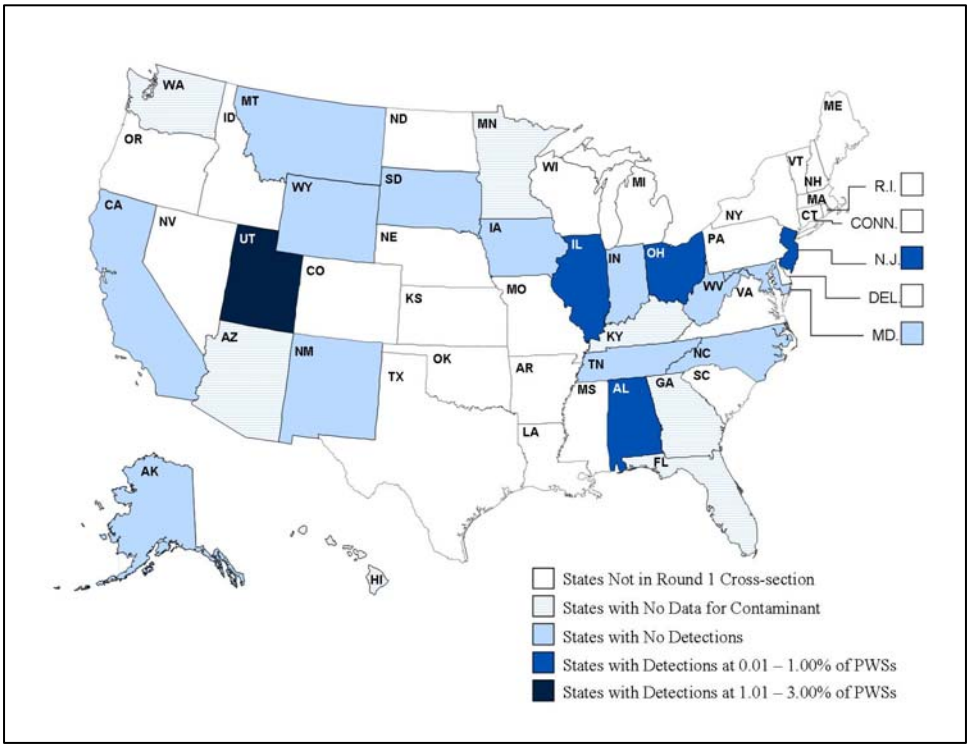


Exhibit 7.2.b. Geographic Distribution of 1,3-Dichloropropene Detection Frequencies in Cross-Section States (Upper Map: Round 1; Lower Map: Round 2)



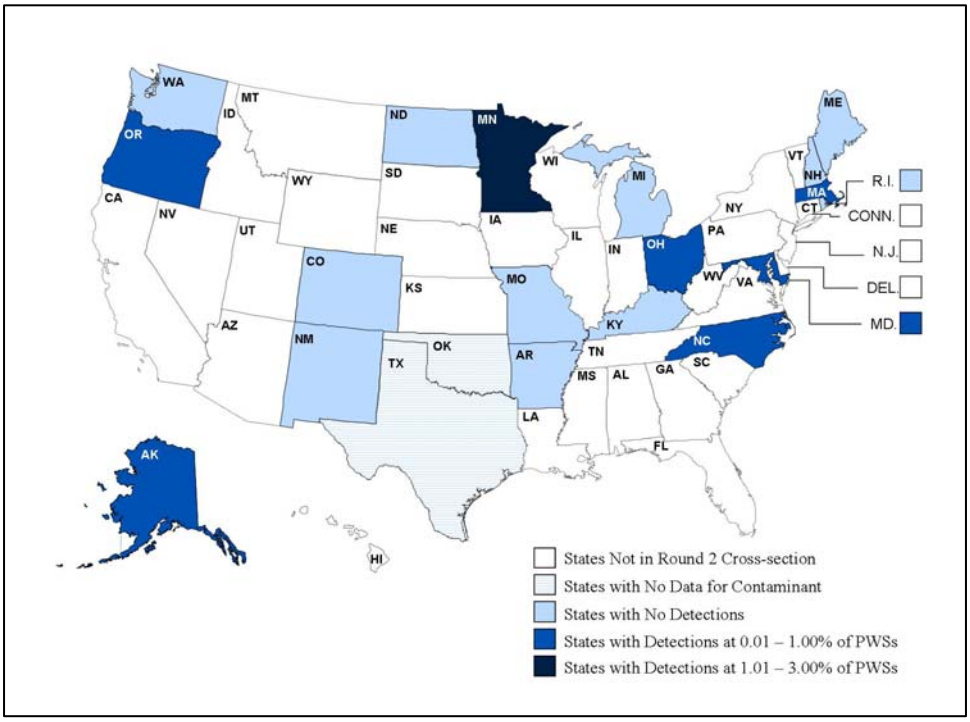
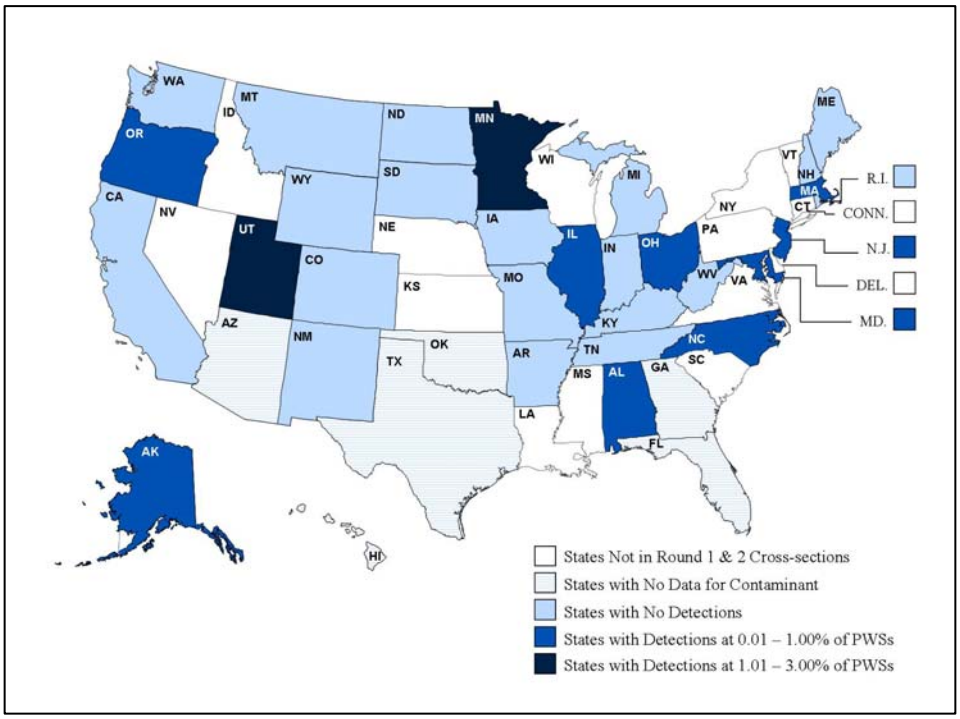
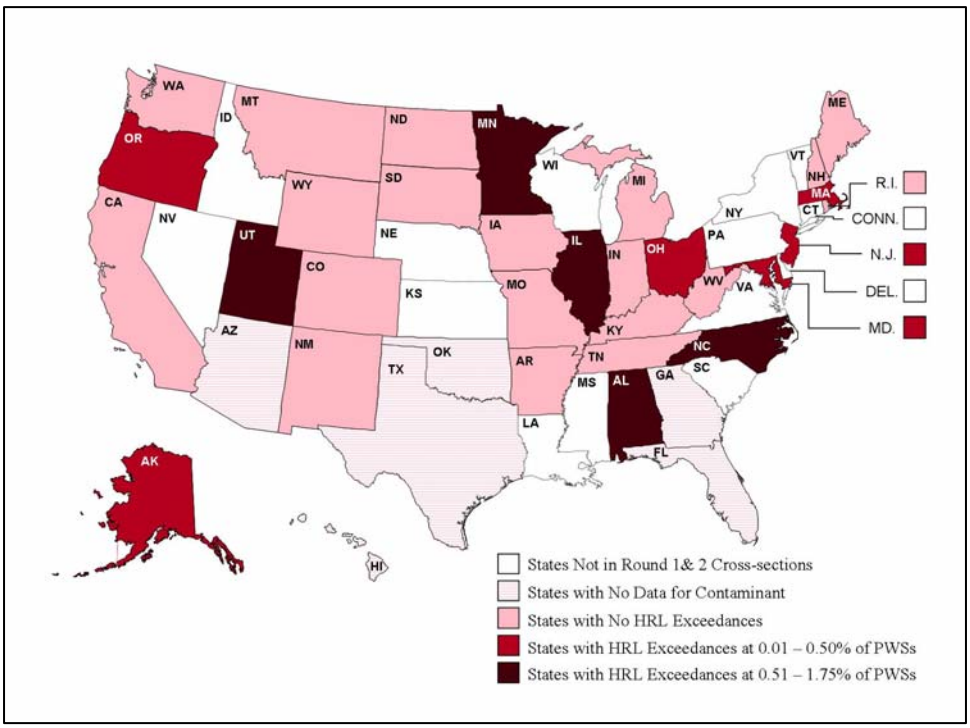


Exhibit 7.2.c presents the combined Round 1 and Round 2 Cross-Section States with analytical detections of 1,3-dichloropropene equal to or greater than the MRL (upper map) and greater than the HRL (lower map). Each State shows the highest percentage of detections for *either* Round 1 or Round 2 – State detection frequencies for the maps below are not averages of Round 1 and Round 2 data. The States with the highest percentage (between 1% and 3%) of 1,3-dichloropropene analytical detections are Minnesota and Utah. PWSs in several States detected concentrations above the HRL of 0.4 µg/L. The States with the highest percentage (between 0.51% and 1.75%) of 1,3-dichloropropene concentrations greater than the HRL are Minnesota, Utah, Illinois, Alabama, and North Carolina. Minnesota and Utah, consequently, exhibit both elevated numbers of detections for 1,3-dichloropropene, and elevated concentrations, relative to the other States in the cross-sections.

Exhibit 7.2.c. Geographic Distribution of 1,3-Dichloropropene Detection Frequencies (upper map) and HRL Exceedance Frequencies (lower map) for All Round 1 and Round 2 Cross-Section States

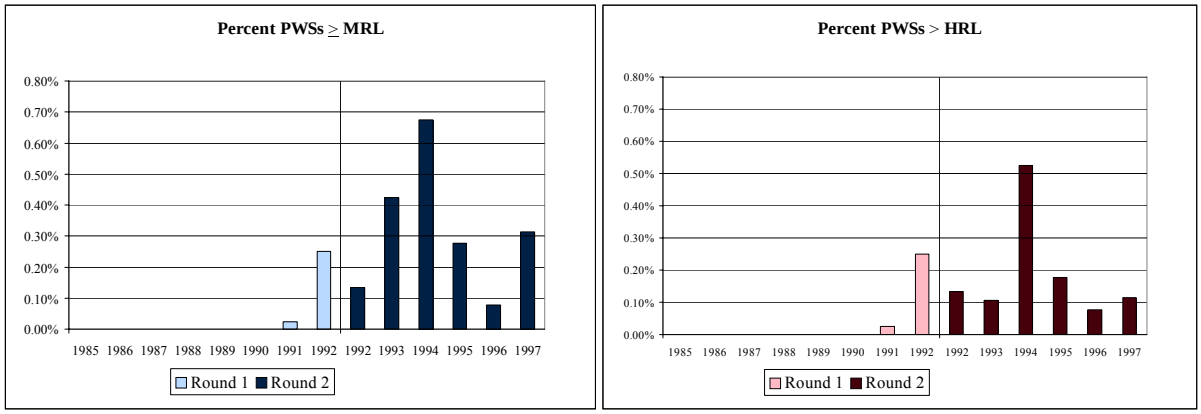




1,3-Dichloropropene occurrence over time is presented in Exhibits 7.2.d and 7.2.e. The data used in these two exhibits were from the eight States that had 1,3-Dichloropropene

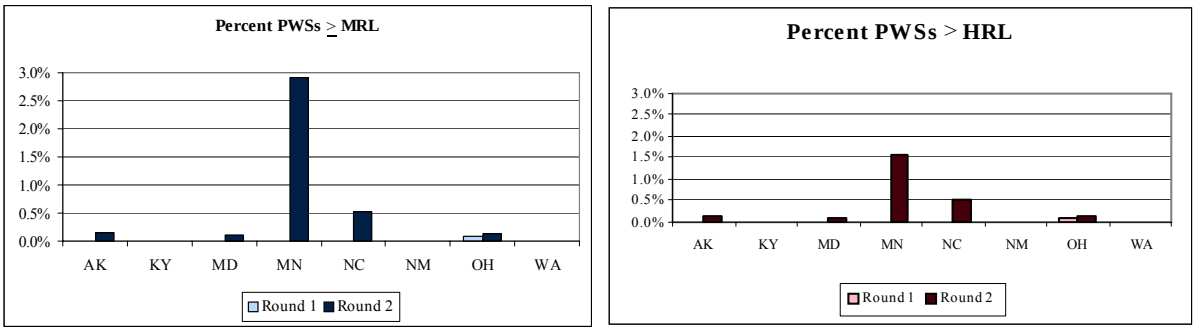
occurrence data in both the Round 1 and Round 2 databases (Alaska, Kentucky, Maryland, Minnesota, North Carolina, New Mexico, Ohio and Washington). In both exhibits, occurrence is measured relative to the MRL in the left graph and relative to the HRL in the right graph. In Exhibit 7.2.d, the graphs suggest annual variability in occurrence between 1991 and 1997, with an increase in concentrations starting in 1992. Note: Significantly fewer PWSs collected 1,3-dichloropropene data in 1992, as compared to subsequent years so the single detection of 1,3-dichloropropene in 1992 caused the overall percentage of PWSs with detections in that year to appear high. However, it is unclear why there is an increase in occurrence between 1992 and 1994; the use and release of 1,3-dichlorpropene decreased throughout the 1990's (Chapter 6 of USEPA, 2006b). Exhibit 7.2.e presents the occurrence of 1,3-dichloropropene by State. With the exception of Ohio, none of the eight States had any detections in the Round 1 data.

Exhibit 7.2.d. Annual Frequency of 1,3-Dichloropropene Detections (left) and HRL Exceedances (right), 1985 - 1997, in Select Cross-Section States



Summary statistics by year are from 8 States: AK, KY, MD, MN, NC, NM, OH and WA. These are the only Cross-Section States with PWS 1,3-dichloropropene data in both Round 1 and Round 2. There are data for 1992 in both the Round 1 and Round 2 databases. The HRL used for 1,3-dichloropropene is 0.4 µg/L. This is a draft value for working review only.

Exhibit 7.2.e. Distribution of 1,3-Dichloropropene Detections (left) and HRL Exceedances (right) Among Select Cross-Section States



The Health Reference Level (HRL) used for 1,3-dichloropropene is 0.4 µg/L. This is a draft value for working review only. These are the only Cross-Section States with PWS 1,3-dichloropropene data in both Round 1 and Round 2.

7.3 1,1,2,2-Tetrachloroethane

Both Round 1 and Round 2 contain occurrence data for 1,1,2,2-tetrachloroethane. Based on these data, 1,1,2,2-tetrachloroethane appears to occur throughout the United States. However, its occurrence does not appear to have a distinct geographic pattern (see Exhibit 7.3.a, which includes all States, both cross-section and non-cross-section States, from both Round 1 and 2 databases). Twenty-five of 46 States with 1,1,2,2-tetrachloroethane data in Round 1 and Round 2 had at least one public water system with at least one analytical detection of the contaminant. In Exhibit 7.3.b, occurrence relative to the MRL is presented for the Round 1 cross-section States in the left map and the Round 2 cross-section States in the right map. Generally, the maps reflect 1,1,2,2-tetrachloroethane's broad occurrence. There is no apparent geographic trend among the States with the highest proportion of analytical detections. South Dakota has an especially high percentage of detections with 11.64%. Florida is the second highest with 4.15%.

Exhibit 7.3.a. Geographic Distribution of 1,1,2,2-Tetrachloroethane Detections in Both Cross-Section and Non-Cross-Section States (Combined Rounds 1 and 2)

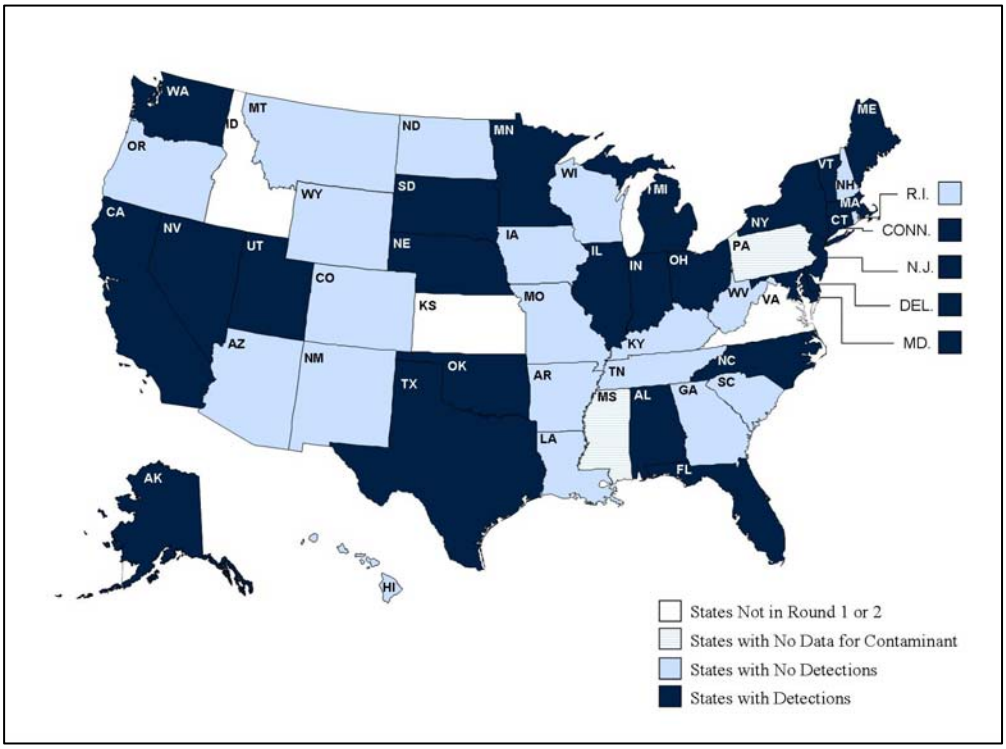
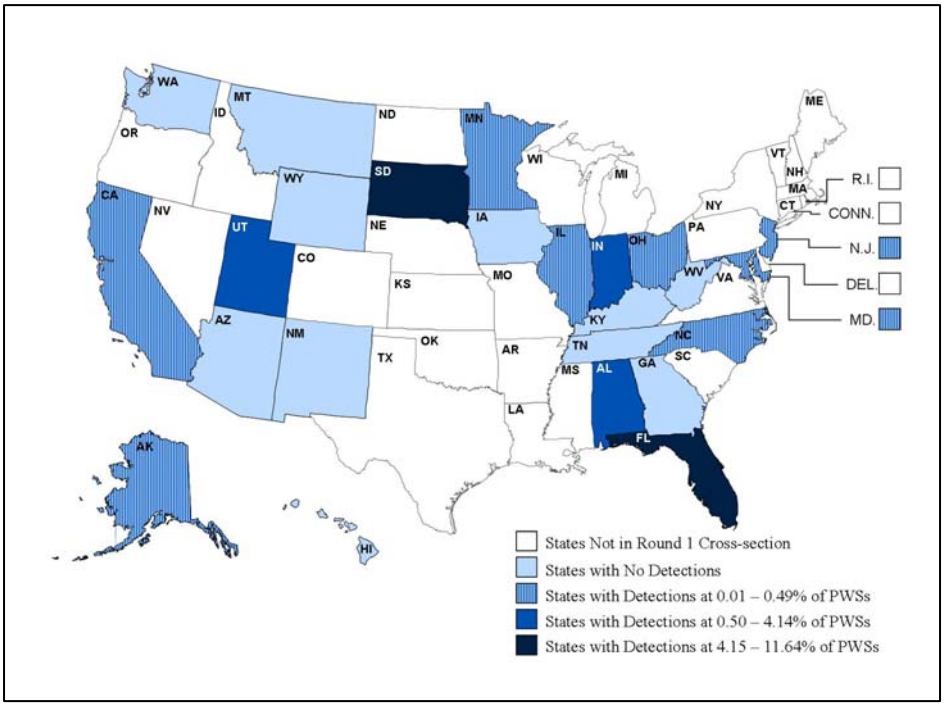


Exhibit 7.3.b. Geographic Distribution of 1,1,2,2-Tetrachloroethane Detection Frequencies in Cross-Section States (Upper Map: Round 1; Lower Map: Round 2)



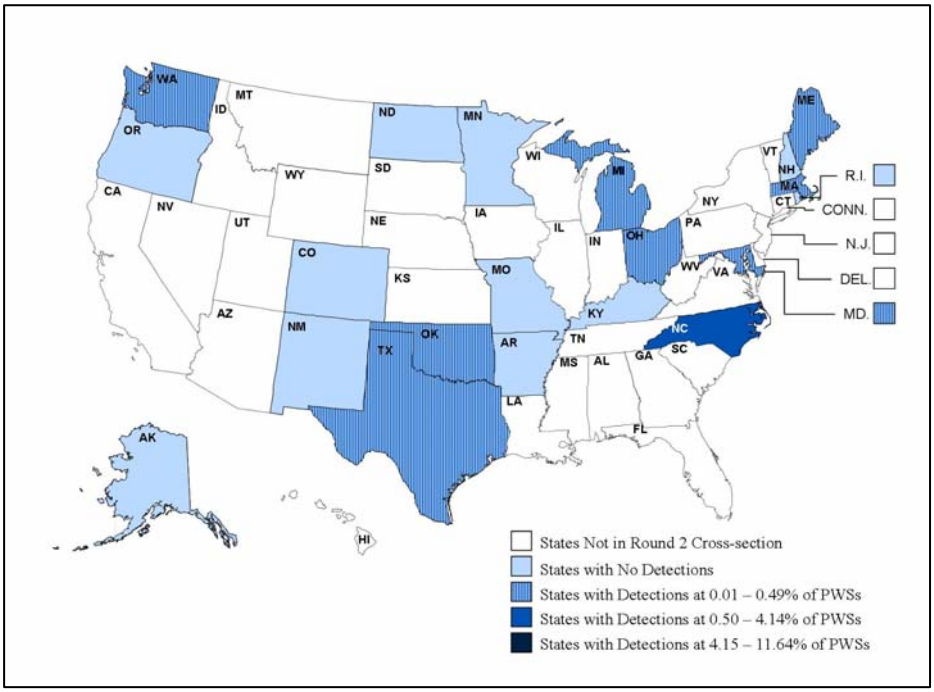
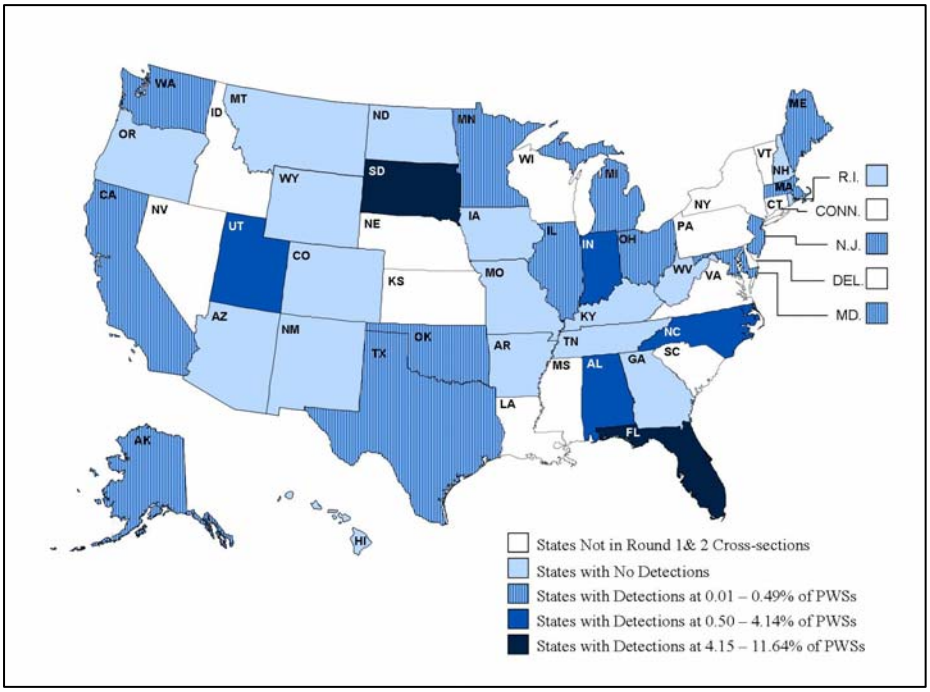
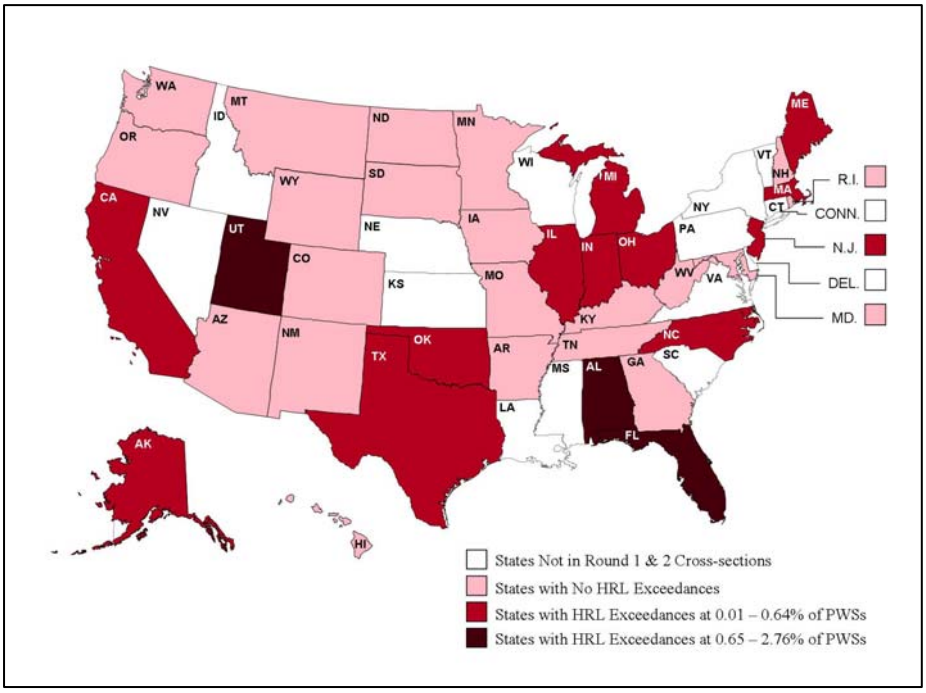


Exhibit 7.3.c presents the combined Round 1 and Round 2 States with analytical detections of 1,1,2,2-tetrachloroethane equal to or greater than the MRL (upper map) and greater than the HRL (lower map). Each State shows the highest percentage of system detections for *either* Round 1 or Round 2 – State detection frequencies for the maps below are not averages of Round 1 and Round 2 data. As presented previously, the two States with the highest percentage (between 4.15% and 11.6%) of 1,1,2,2-tetrachloroethane analytical detections are South Dakota and Florida. PWSs in several States detected concentrations above the HRL of 0.4 µg/L. The States with the highest percentage (between 0.65% and 2.76%) of 1,1,2,2-tetrachloroethane concentrations greater than the HRL are Utah, Alabama, and Florida. In Round 2, North Carolina is the only State to have more than 0.50% system detections greater than the HRL.

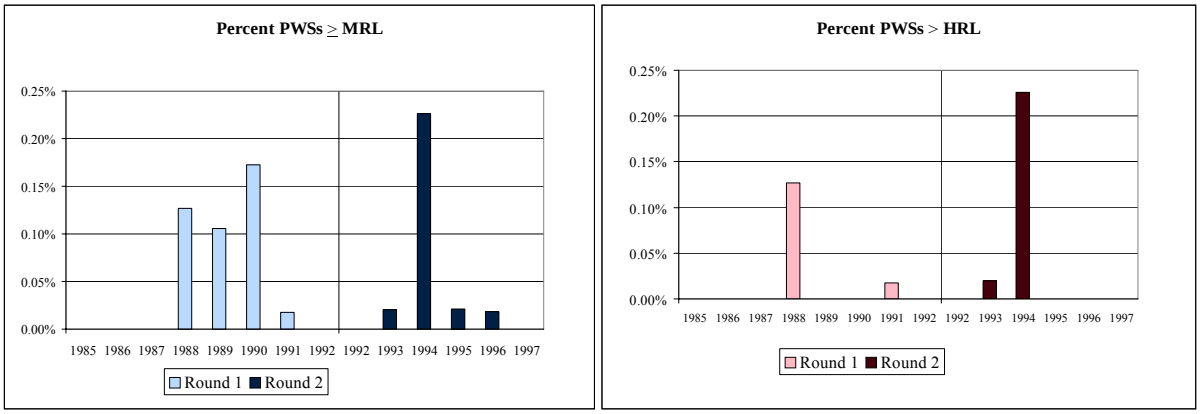
Exhibit 7.3.c. Geographic Distribution of 1,1,2,2-Tetrachloroethane Detection Frequencies (upper map) and HRL Exceedance Frequencies (lower map) for All Round 1 and Round 2 Cross-Section States





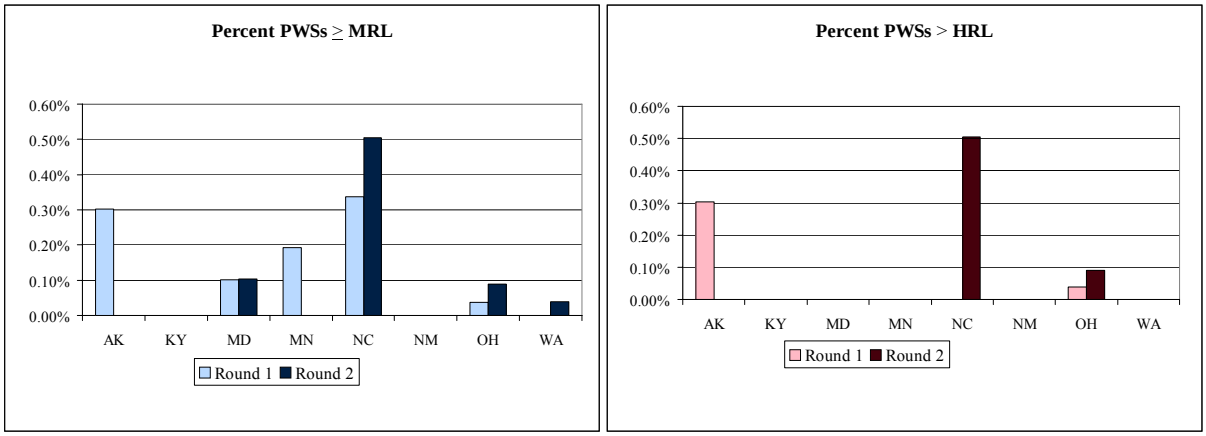
1,1,2,2-Tetrachloroethane occurrence over time is presented in Exhibits 7.3.d and 7.3.e for the cross-section States. The data used in these two exhibits are from the eight States that had 1,1,2,2-tetrachloroethane occurrence data in both the Round 1 and Round 2 databases (Alaska, Kentucky, Maryland, Minnesota, North Carolina, New Mexico, Ohio and Washington). In both exhibits, occurrence is measured relative to the MRL in the left graph and relative to the HRL in the right graph. In Exhibit 7.3.d, the graphs suggest annual variability in occurrence between 1988 and 1997, with a spike in concentrations in 1994. Detections greater than the HRL were disproportionately observed in 1988 (Round 1) and 1994 (Round 2). Many fewer PWSs collected 1,1,2,2-tetrachloroethane samples in Round 1 compared to Round 2; thus, any detections that occurred in the Round 1 data caused the overall percentage of PWSs with 1,1,2,2-tetrachloroethane detections to appear elevated. It is unclear why there were more detections of 1,1,2,2-tetrachloroethane in 1994 compared to other years. Production for commercial uses in the United States ceased by the late 1980's and releases of the contaminant steadily declined from 1989 to 2003 (Chapter 11 of USEPA, 2006b). Exhibit 7.3.e presents the occurrence of 1,1,2,2-tetrachloroethane by State. No trend is evident between 1,1,2,2-tetrachloroethane occurrence in Round 1 and Round 2, based on these graphs.

Exhibit 7.3.d. Annual Frequency of 1,1,2,2-Tetrachloroethane Detections (left) and HRL Exceedances (right), 1985 - 1997, in Select Cross-Section States



Summary statistics by year are from 8 States: AK, KY, MD, MN, NC, NM, OH and WA. These are the only Cross-Section States with PWS 1,1,2,2-tetrachloroethane data in both Round 1 and Round 2. There are data for 1992 in both the Round 1 and Round 2 databases. The HRL used for 1,1,2,2-tetrachloroethane is 0.4 µg/L. This is a draft value for working review only.

Exhibit 7.3.e. Distribution of 1,1,2,2-Tetrachloroethane Detections (left) and HRL Exceedances (right) Among Select Cross-Section States



The Health Reference Level (HRL) used for 1,1,2,2-tetrachloroethane is 0.4 μg/L. This is a draft value for working review only. These are the only Cross-Section States with PWS 1,1,2,2-tetrachloroethane data in both Round 1 and Round 2.

8. References

Frey, M.M., C. Seidel, M. Edwards, J. Parks, and L. McNeill. 2004. *Occurrence Survey for Boron and Hexavalent Chromium.* AwwaRF Report 91044F.

Longtin, J. P. 1988. Occurrence of Radon, Radium, and Uranium in Groundwater. *Journal of the American Water Works Association*. 80(7):84-93.

National Center for Food and Agricultural Policy (NCFAP). 2004. National Pesticide Use Database. Available on the Internet at: http://www.ncfap.org/database/default.htm.

Seidel, C. 2006. Email Communication to Brent Ranalli at The Cadmus Group, Inc. [concerning boron data from an AWWARF-sponsored study, with data in an attached spreadsheet]. Denver, CO: McGuire Malcolm Pirnie; May 19, 2006.

U.S. Department of Commerce (USDOC), Bureau of the Census. 1994. 1992 Census of Agriculture. Washington, D.C.: U.S. Government Printing Office.

USDOC, Bureau of the Census. 1996. 1992 Census of Manufactures. Washington, D.C.: U.S. Government Printing Office.

USDOC, Bureau of the Census. 1997. 1995 Annual Survey of Manufactures. Washington, D.C.: U.S. Government Printing Office.

U.S. Environmental Protection Agency (USEPA). 1999. *A Review of Contaminant Occurrence in Public Water Systems*. EPA Report # 816-R-99-006, Office of Water, 78 pp.

USEPA. 2000. *Water Industry Baseline Handbook, Second Edition (Draft)*. March 17.

USEPA. 2002. *Analysis of National Occurrence of the 1998 Contaminant Candidate List (CCL) Regulatory Determination Priority Contaminants in Public Water Systems*. EPA 815-D-01-002, Office of Water, 77 pp.

USEPA. 2003. *Analysis of National Occurrence of 14 Contaminants from the 1998 Contaminant Candidate List (CCL)*. Office of Water, 58 pp.

USEPA, 2006a. *The Analysis of Occurrence Data from the First Unregulated Contaminant Monitoring Regulation (UCMR 1) In Support of Regulatory Determinations for the Second Drinking Water Contaminant Candidate List.* Preliminary Draft. December 2006.

USEPA. 2006b. *Comprehensive Regulatory Support Document for the Unregulated Contaminants Considered Under the Regulatory Determinations for the Second Drinking Water Contaminant Candidate List*. Preliminary Draft. December 2006.

APPENDICES

APPENDIX A. **Development of Health Reference Levels (HRLs)**

APPENDIX B. **Detailed Round 1 Data Summary for 1,3-Dichloropropene, and 1,1,2,2-Tetrachloroethane**

APPENDIX C. **Detailed Round 2 Data Summary for Metolachlor, 1,3-Dichloropropene, and 1,1,2,2-Tetrachloroethane**

APPENDIX D. **Detailed NIRS Data Summary for Boron**

APPENDIX E. **Data Summaries of Occurrence and Population Served for Four Contaminants Considered During CCL 2 Regulatory Determinations**

Notes to Accompany Appendix Tables

The following tables present a summary of the analytical results and occurrence for the listed contaminants. The various measures and descriptive statistics shown on the tables include:

Total # Samples = the total number of analytical records for the contaminant in the state (or in the portion of the data indicated).

Total Unique PWS = the total number of public water systems with records for the contaminant in the state (or in the portion of the data indicated).

Total Pop Served = the total summation of population served-by values for all public water systems with records for the contaminant in the state (or in the portion of the data indicated).

Minimum Value = the minimum analytical value of all analytical results for the contaminant in the state data set (or in the portion of the data indicated).

99th Value = the concentration value of the 99th percentile of all analytical results for the contaminant in the state data set (or in the portion of the data indicated).

Maximum Value = the maximum analytical value of all analytical results for the contaminant in the state data set (or in the portion of the data indicated).

Minimum Detects = the minimum analytical value of all the detections (analytical results greater than the Minimum Reporting Level) for the contaminant in the state dataset (or in the portion of the data indicated).

Median Detects = the median analytical value of all the detections (analytical results greater than the Minimum Reporting Level) for the contaminant in the state dataset (or in the portion of the data indicated).

% PWS (or POP) ≥ MRL = percent of the total number of (or population served-by) public water systems with at least one analytical result equal to or greater than the Minimum Reporting Level.

% PWS (or POP) > ½ HRL = percent of the total number of (or population served-by) public water systems with at least one analytical result that exceeded half the Health Reference Level.

% PWS (or POP) > HRL = percent of the total number of (or population served-by) public water systems with at least one analytical result that exceeded the Health Reference Level.

Total = the total number of samples, unique PWSs, and percent PWSs exceeding the MRL, ½ HRL, or HRL are the summation of all values for all the states for the contaminant; i.e. Total = all data from 40 states/territories; 24 States = all data from cross-section of 24 states. The values indicated as "totals" for the analytical results, e.g. minimum value, 99th percentile value, etc., are similarly the value derived from the data from all states, or 24 states respectively.

Concentration values for Round 1 and Round 2 data are measured in micrograms per liter (µg/L).

Concentration values for NIRS data are measured in milligrams per liter (mg/L).

Appendix A. Development of Health Reference Levels

Section 1412(b)(1)(A)(i) of SDWA requires EPA to determine whether each candidate contaminant may have an adverse effect on public health. This appendix describes the overall process the Agency used to evaluate health effects information, the approach used to estimate a contaminant health reference level or HRL (a benchmark against which to conduct the initial evaluation of the occurrence data), and the approach used to identify and evaluate information on hazard and dose-response for the contaminants under consideration.

There are two different approaches to the derivation of an HRL. One approach is used for chemicals that cause cancer and exhibit a linear response to dose and the other applies to non-carcinogens and carcinogens evaluated using a non-linear approach.

Use of Carcinogenicity Data for the Derivation of a Health Reference Level

Two of the contaminants discussed in this report had data available to classify them as likely or probable human carcinogens. These two contaminants (1,3-dichloropropene and 1,1,2,2-tetrachloroethane) are also the only contaminants for which low dose linear extrapolations were performed. For these contaminants, EPA evaluated data on the mode of action of the chemical to determine the method of low dose extrapolation. When this analysis indicates that a linear low dose extrapolation is appropriate or when data on the mode of action are lacking, EPA uses a low dose linear extrapolation to calculate risk-specific doses. The risk-specific doses are the estimated oral exposures associated with lifetime excess risk levels that range from one cancer in ten thousand (10^{-4}) to one cancer in a million (10^{-6}). The risk-specific doses (expressed as mg/kg of body weight per day) are combined with adult body weight and drinking water consumption data to estimate drinking water concentrations corresponding to this risk range. EPA generally used the one-in-a-million (10^{-6}) cancer risk in the initial screening of the occurrence data for carcinogens evaluated using linear low dose extrapolation.

Use of Non-carcinogenic Health Effects Data for Derivation of a Health Reference Level

The remaining contaminant (metolachlor) has not been identified as known, likely or probable carcinogens. For this contaminant, EPA calculated a reference dose (RfD). An RfD is an estimate of a daily oral exposure to the human population (including sensitive subgroups) that is likely to be without an appreciable risk of deleterious effects during a lifetime. It can be derived from either a “no-observed-adverse-effect level” (NOAEL), a “lowest-observed-adverse-effect level” (LOAEL), or a benchmark dose, with uncertainty factors applied to reflect limitations of the data used.

EPA used uncertainty factors (UFs) to address uncertainty resulting from incompleteness of the toxicological database. The individual UFs (usually applied as integers of 1, 3, or 10) were multiplied together and used to derive the RfD from experimental data. Individual UFs are intended to account for:

(1) the variation in sensitivity among the members of the human population (i.e., intraspecies variability);

(2) the uncertainty in extrapolating animal data to humans (i.e., interspecies variability);
(3) the uncertainty in extrapolating from data obtained in a study with less-than-lifetime exposure to lifetime exposure (i.e., extrapolating from subchronic to chronic exposure);
(4) the uncertainty in extrapolating from a LOAEL rather than from an NOAEL; and/or
(5) the uncertainty associated with an incomplete database.

EPA derived the HRLs using the RfD approach as follows:

$$HRL = [(RfD \times BW)/DWI] \times RSC$$

Where:
RfD = Reference Dose
BW = Body Weight for an adult, assumed to be 70 kilograms (kg)
DWI = Drinking Water Intake, assumed to be 2 L/day (90th percentile)
RSC = Relative Source Contribution, or the level of exposure believed to result from drinking water when compared to other sources (e.g., food, ambient air). A 20 percent RSC is being used to estimate the HRL and screen the occurrence data because it is the lowest and most conservative RSC used in the derivation of a maximum contaminant level goal (MCLG) for drinking water.

For metolachlor, EPA used the RfD in conjunction with a 20 percent RSC to derive a conservative HRL estimate and perform an initial screening of the drinking water occurrence data. Since the initial screening of the occurrence data at this conservative HRL value resulted in negligible occurrence findings for metolachlor, EPA recognized that it was not necessary to further evaluate the RSC in making the regulatory determination.

Appendix B. Detailed Round 1 Data Summary for 1,3-Dichloropropene and 1,1,2,2-Tetrachloroethane

Table B 1.a Round 1 Data - 1,3-Dichloropropene Occurrence in Public Water Systems - Based on Number of Samples

Table B.1.b Round 1 Data - 1,3-Dichloropropene Occurrence in Public Water Systems - Based on Number of Systems

Table B.1.c Round 1 Data - 1,3-Dichloropropene Occurrence in Public Water Systems - Based on Population Served

Table B.2.a Round 1 Data - 1,1,2,2-Tetrachloroethane Occurrence in Public Water Systems - Based on Number of Samples

Table B.2.b Round 1 Data - 1,1,2,2-Tetrachloroethane Occurrence in Public Water Systems - Based on Number of Systems

Table B.2.c Round 1 Data - 1,1,2,2-Tetrachloroethane Occurrence in Public Water Systems - Based on Population Served

Table B.1.a Round 1 Data - 1,3-Dichloropropene Occurrence in Public Water Systems - Based on Number of Samples

STATE	TOTAL UNIQUE PWSs	TOTAL # SAMPLES	# GW SAMPLES	# SW SAMPLES	% TOTAL SAMPLES ≥ MRL	% GW SAMPLES ≥ MRL	% SW SAMPLES ≥ MRL	MIN VALUE (µg/L)	99% VALUE (µg/L)	MAX VALUE (µg/L)	MIN DETECTS (µg/L)	MEDIAN DETECTS (µg/L)
AK	656	1,568	1,283	285	0.00%	0.00%	0.00%	< 0.00	< 0.00	< 0.00		
AL	131	351	244	107	0.28%	0.41%	0.00%	< 0.50	< 0.50	1.60	1.60	1.60
AR												
AZ												
CA	259	1,994	1,862	132	0.00%	0.00%	0.00%	< 0.00	< 0.50	< 2.00		
CO	5	15	14	1	0.00%	0.00%	0.00%	< 0.08	< 5.00	< 5.00		
DC												
DE	9	280	145	135	0.00%	0.00%	0.00%	< 0.50	< 0.80	< 0.80		
FL												
GA												
HI												
IA	745	1,055	952	103	0.00%	0.00%	0.00%	< 0.20	< 1.00	< 1.00		
IL	258	938	624	314	0.21%	0.00%	0.64%	< 0.02	< 2.00	2.00	1.20	1.60
IN	146	819	618	201	0.00%	0.00%	0.00%	< 0.02	< 1.00	< 1.00		
KY												
LA	1	1	1	0	0.00%	0.00%	0.00%	< 0.50	< 0.50	< 0.50		
MA	2	8	5	3	75.00%	60.00%	100.00%	< 0.00	17.00	17.00	0.50	1.85
MD	978	1,582	1,275	307	0.00%	0.00%	0.00%	< 0.50	< 0.50	< 0.50		
MI												
MN												
MO	85	324	298	26	0.31%	0.34%	0.00%	< 0.20	< 2.00	0.20	0.20	0.20
MS												
MT	20	35	16	19	0.00%	0.00%	0.00%	< 0.50	< 2.00	< 2.00		
NC	297	644	569	75	0.00%	0.00%	0.00%	< 0.50	< 0.50	< 0.50		
NE												
NH												
NJ	1,455	3,067	2,706	361	0.10%	0.07%	0.28%	< 0.00	< 1.00	1.40	1.00	1.30
NM	590	1,595	1,475	120	0.00%	0.00%	0.00%	< 0.00	< 1.00	< 5.00		
NV	7	125	115	10	0.00%	0.00%	0.00%	< 0.20	< 0.20	< 0.20		
NY	29	104	28	76	0.00%	0.00%	0.00%	< 0.20	< 0.50	< 1.00		
OH	2,532	14,328	13,659	669	0.01%	0.01%	0.00%	< 0.00	< 1.00	1.00	1.00	1.00
SD	335	444	363	81	0.00%	0.00%	0.00%	< 0.50	< 0.50	< 0.50		
TN	303	1,220	433	787	0.00%	0.00%	0.00%	< 0.02	< 0.50	< 0.50		
TX	2	2	2	0	100.00%	100.00%	0.00%	2.00	12.00	12.00	2.00	7.00
UT	400	1,259	1,154	105	0.95%	0.78%	2.86%	< 0.00	< 10.00	1.90	0.50	0.50
VI	3	10	0	10	0.00%	0.00%	0.00%	< 1.00	< 1.00	< 1.00		
VT												
WA												
WV	58	204	61	143	0.00%	0.00%	0.00%	< 0.20	< 4.00	< 4.00		
WY	1	1	1	0	0.00%	0.00%	0.00%	< 0.00	< 0.00	< 0.00		
TOTAL	9,307	31,973	27,903	4,070	0.09%	0.07%	0.22%	< 0.00	< 1.00	17.00	0.20	1.00
24 STATES	9,164	31,104	27,295	3,809	0.06%	0.05%	0.16%	< 0.00	< 1.00	2.00	0.50	1.00

PWS = Public Water System; GW = Ground Water; SW = Surface Water; MRL= Minimum Reporting Limit; Min, 99%, and Max Value = the minimum, the 99th percentile value, and the maximum value of all samples; Min and Median Detects = the minimum and median of all sample detects.

- The highlighted States are part of the 24-State Round 1 Cross-Section.

- Less-than (<) values indicate MRL values. Some systems did not report MRL values. In the data, these MRL values are represented by zeros (e.g "< 0.00").

Table B.1.b. Round 1 Data - 1,3-Dichloropropene Occurrence in Public Water Systems - Based on Number of Systems

STATE	TOTAL # SAMPLES	TOTAL UNIQUE PWS	# GW PWS	# SW PWS	% PWS ≥ MRL	% GW PWS ≥ MRL	% SW PWS ≥ MRL	% PWS > ½ HRL	% GW PWS > ½ HRL	% SW PWS > ½ HRL	% PWS > HRL	% GW PWS > HRL	% SW PWS > HRL
AK	1,568	656	527	134	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
AL	351	131	93	42	0.76%	1.08%	0.00%	0.76%	1.08%	0.00%	0.76%	1.08%	0.00%
AR													
AZ													
CA	1,994	259	227	46	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
CO	15	5	4	1	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
DC													
DE	280	9	7	2	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
FL													
GA													
HI													
IA	1,055	745	716	29	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
IL	938	258	185	73	0.78%	0.00%	2.74%	0.78%	0.00%	2.74%	0.78%	0.00%	2.74%
IN	819	146	121	25	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
KY													
LA	1	1	1	0	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MA	8	2	2	1	50.00%	50.00%	100.00%	50.00%	50.00%	100.00%	50.00%	50.00%	100.00%
MD	1,582	978	935	43	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MI													
MN													
MO	324	85	71	14	1.18%	1.41%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MS													
MT	35	20	11	9	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
NC	644	297	254	44	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
NE													
NH													
NJ	3,067	1,455	1,430	25	0.21%	0.14%	4.00%	0.21%	0.14%	4.00%	0.21%	0.14%	4.00%
NM	1,595	590	555	35	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
NV	125	7	6	2	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
NY	104	29	5	26	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
OH	14,328	2,532	2,384	150	0.08%	0.08%	0.00%	0.08%	0.08%	0.00%	0.08%	0.08%	0.00%
SD	444	335	306	29	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
TN	1,220	303	156	147	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
TX	2	2	2	0	100.00%	100.00%	0.00%	100.00%	100.00%	0.00%	100.00%	100.00%	0.00%
UT	1,259	400	382	29	1.75%	1.31%	6.90%	1.75%	1.31%	6.90%	1.75%	1.31%	6.90%
VI	10	3	0	3	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
VT													
WA													
WV	204	58	20	38	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
WY	1	1	1	0	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
TOTAL	31,973	9,307	8,401	947	0.20%	0.17%	0.63%	0.19%	0.15%	0.63%	0.19%	0.15%	0.63%
24 STATES	31,104	9,164	8,303	898	0.16%	0.12%	0.56%	0.16%	0.12%	0.56%	0.16%	0.12%	0.56%

PWS = Public Water System; GW = Ground Water; SW = Surface Water; "% PWS ≥ MRL", "> ½ HRL", and "> HRL" are the proportion of systems with at least one analytic result equal to or greater than the MRL, exceeding the ½ HRL benchmark, and exceeding the HRL benchmark, respectively.

- The highlighted States are part of the 24-State Round 1 Cross-Section.
- The HRL used for 1,3-Dichloropropene is 0.4 µg/L. This is a draft value for working review only.

Table B.1.c. Round 1 Data - 1,3-Dichloropropene Occurrence in Public Water Systems - Based on Population Served

STATE	TOTAL POP SERVED	GW POP SERVED	SW POP SERVED	% POP ≥ MRL	% GW POP ≥ MRL	% SW POP ≥ MRL	% POP > ½ HRL	% GW POP > ½ HRL	% SW POP > ½ HRL	% POP > HRL	% GW POP > HRL	% SW POP > HRL
AK	1,086	1,086	0	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
AL	2,417,639	1,195,423	1,514,944	0.22%	0.44%	0.00%	0.22%	0.44%	0.00%	0.22%	0.44%	0.00%
AR												
AZ												
CA	9,972,097	9,331,228	2,422,363	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
CO	386,658	349,700	36,958	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
DC												
DE	479,534	246,534	233,000	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
FL												
GA												
HI												
IA	1,086,985	804,288	282,697	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
IL	6,257,995	1,529,195	4,728,800	0.24%	0.00%	0.32%	0.24%	0.00%	0.32%	0.24%	0.00%	0.32%
IN	2,251,503	567,606	1,683,897	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
KY												
LA	400	400	0	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MA	66,550	66,550	52,050	78.21%	78.21%	100.00%	78.21%	78.21%	100.00%	78.21%	78.21%	100.00%
MD	4,811,057	761,204	4,049,853	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MI												
MN												
MO	890,030	717,341	172,689	0.36%	0.45%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MS												
MT	190,933	9,861	181,072	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
NC	1,109,397	452,814	656,833	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
NE												
NH												
NJ	5,309,506	1,738,792	3,570,714	4.25%	0.04%	6.30%	4.25%	0.04%	6.30%	4.25%	0.04%	6.30%
NM	1,361,172	1,162,879	198,293	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
NV	63,910	56,410	34,560	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
NY												
OH	8,083,502	3,300,218	4,810,984	0.01%	0.02%	0.00%	0.01%	0.02%	0.00%	0.01%	0.02%	0.00%
SD	510,708	230,535	280,173	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
TN	3,915,111	1,240,820	2,674,291	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
TX	8,973	8,973	0	100.00%	100.00%	0.00%	100.00%	100.00%	0.00%	100.00%	100.00%	0.00%
UT	3,098,407	2,276,635	1,735,395	6.12%	6.13%	2.88%	6.12%	6.13%	2.88%	6.12%	6.13%	2.88%
VI	66,000	0	66,000	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
VT												
WA												
WV	539,758	58,234	481,524	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
WY	150	150	0	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
TOTAL	52,879,061	26,106,876	29,867,090	0.95%	0.81%	1.15%	0.94%	0.79%	1.15%	0.94%	0.79%	1.15%
24 STATES	50,917,006	24,660,968	29,271,833	0.86%	0.59%	0.99%	0.86%	0.59%	0.99%	0.86%	0.59%	0.99%

PWS = Public Water System; GW = Ground Water; SW = Surface Water; "% POP ≥ MRL", "> ½ HRL", and "> HRL" are the proportion of the total population served by systems with at least one analytic result equal to or greater than the MRL, exceeding the ½ HRL benchmark, and exceeding the HRL benchmark, respectively.

- The highlighted States are part of the 24-State Round 1 Cross-Section.
- The HRL used for 1,3-Dichloropropene is 0.4 µg/L. This is a draft value for working review only.

Table B.2.a. Round 1 Data - 1,1,2,2-Tetrachloroethane Occurrence in Public Water Systems - Based on Number of Samples

STATE	TOTAL UNIQUE PWS	TOTAL # SAMPLES	# GW SAMPLES	# SW SAMPLES	% TOTAL SAMPLES ≥ MRL	% GW SAMPLES ≥ MRL	% SW SAMPLES ≥ MRL	MIN VALUE (µg/L)	99% VALUE (µg/L)	MAX VALUE (µg/L)	MIN DETECTS (µg/L)	MEDIAN DETECTS (µg/L)
AK	661	1,610	1,323	287	0.12%	0.08%	0.35%	< 0.00	< 0.00	200.00	49.00	124.50
AL	131	351	244	107	0.85%	0.82%	0.93%	< 0.50	< 0.50	0.90	0.50	0.80
AR												
AZ	944	2,932	2,272	660	0.00%	0.00%	0.00%	< 0.05	< 2.00	< 10.00		
CA	3,522	11,667	11,564	103	0.12%	0.12%	0.00%	< 0.00	< 0.50	5.80	0.50	1.55
CO	9	33	30	3	0.00%	0.00%	0.00%	< 0.04	< 5.00	< 5.00		
DC	1	62	0	62	0.00%	0.00%	0.00%	< 0.50	< 0.50	< 0.50		
DE	13	333	189	144	0.60%	1.06%	0.00%	< 0.20	< 0.50	9.00	0.40	4.70
FL	217	315	70	245	3.17%	4.29%	2.86%	< 0.00	1.00	1.00	0.05	0.80
GA	1,161	2,460	1,861	599	0.00%	0.00%	0.00%	< 0.50	< 0.50	< 0.50		
HI	127	1,221	1,081	140	0.00%	0.00%	0.00%	< 0.00	< 0.30	< 0.30		
IA	1,002	1,908	1,697	211	0.00%	0.00%	0.00%	< 0.40	< 1.00	< 1.00		
IL	1,302	6,002	5,035	967	0.10%	0.06%	0.31%	< 0.02	< 1.00	2.50	0.11	0.50
IN	311	1,724	1,338	386	0.17%	0.22%	0.00%	< 0.10	< 2.00	2.74	0.49	0.88
KY	524	2,076	1,119	957	0.00%	0.00%	0.00%	< 0.50	< 1.00	< 1.00		
LA	13	22	18	4	0.00%	0.00%	0.00%	< 0.50	< 0.50	< 0.50		
MA	2	2	1	1	100.00%	100.00%	100.00%	0.63	2.20	2.20	0.63	1.42
MD	986	1,909	1,441	468	0.05%	0.00%	0.21%	< 0.10	< 0.50	0.20	0.20	0.20
MI	1	1	1	0	100.00%	100.00%	0.00%	13.00	13.00	13.00	13.00	13.00
MN	1,565	2,756	2,677	79	0.11%	0.11%	0.00%	< 0.20	< 1.00	0.20	0.20	0.20
MO	85	323	297	26	0.00%	0.00%	0.00%	< 0.20	< 2.00	< 2.00		
MS												
MT	565	1,624	1,376	248	0.00%	0.00%	0.00%	< 0.50	< 1.00	< 1.00		
NC	297	644	569	75	0.16%	0.18%	0.00%	< 0.07	< 0.50	0.07	0.07	0.07
NE	1	1	1	0	100.00%	100.00%	0.00%	1.20	1.20	1.20	1.20	1.20
NH												
NJ	1,511	3,130	2,775	355	0.35%	0.40%	0.00%	< 0.00	< 1.00	112.00	0.52	2.80
NM	590	1,595	1,475	120	0.00%	0.00%	0.00%	< 0.00	< 1.00	< 5.00		
NV	8	148	136	12	0.68%	0.74%	0.00%	< 0.00	< 0.20	1.00	1.00	1.00
NY	355	2,160	1,618	542	0.09%	0.06%	0.18%	< 0.04	< 1.00	3.00	2.00	2.50
OH	2,656	16,084	15,166	918	0.01%	0.01%	0.00%	< 0.00	< 1.00	2.00	2.00	2.00
SD	335	444	363	81	8.78%	9.37%	6.17%	< 0.15	0.15	0.22	0.15	0.15
TN	303	1,220	433	787	0.00%	0.00%	0.00%	< 0.01	< 0.50	< 0.50		
TX												
UT	423	1,328	1,215	113	0.83%	0.82%	0.88%	< 0.00	5.00	1.00	0.30	0.50
VI	3	10	0	10	0.00%	0.00%	0.00%	< 1.00	< 1.00	< 1.00		
VT	1	1	1	0	100.00%	100.00%	0.00%	1.10	1.10	1.10	1.10	1.10
WA	992	3,987	3,656	331	0.00%	0.00%	0.00%	< 0.50	< 0.50	< 0.50		
WV	137	388	164	224	0.00%	0.00%	0.00%	< 0.03	< 4.00	< 4.00		
WY	145	313	259	54	0.00%	0.00%	0.00%	< 0.20	< 0.40	< 1.00		
TOTAL	20,899	70,784	61,465	9,319	0.16%	0.15%	0.23%	< 0.00	< 1.00	200.00	0.05	0.50
24 States	20,407	67,688	59,173	8,515	0.16%	0.15%	0.22%	< 0.00	< 1.00	200.00	0.05	0.50

PWS = Public Water System; GW = Ground Water; SW = Surface Water; MRL= Minimum Reporting Limit; Min, 99%, and Max Value = the minimum, the 99th percentile value, and the maximum value of all samples; Min and Median Detects = the minimum and median of all sample detects.

- The highlighted States are part of the 24-State Round 1 Cross-Section.

- Less-than (<) values indicate MRL values. Some systems did not report MRL values. In the data, these MRL values are represented by zeros (e.g "< 0.00").

Table B.2.b. Round 1 Data - 1,1,2,2-Tetrachloroethane Occurrence in Public Water Systems - Based on Number of Systems

STATE	TOTAL # SAMPLES	TOTAL UNIQUE PWS	# GW PWS	# SW PWS	% PWS ≥ MRL	% GW PWS ≥ MRL	% SW PWS ≥ MRL	% PWS > ½ HRL	% GW PWS > ½ HRL	% SW PWS > ½ HRL	% PWS > HRL	% GW PWS > HRL	% SW PWS > HRL
AK	1,610	661	532	134	0.30%	0.19%	0.75%	0.30%	0.19%	0.75%	0.30%	0.19%	0.75%
AL	351	131	93	42	2.29%	2.15%	2.38%	2.29%	2.15%	2.38%	2.29%	2.15%	2.38%
AR													
AZ	2,932	944	874	106	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
CA	11,667	3,522	3,495	37	0.31%	0.31%	0.00%	0.31%	0.31%	0.00%	0.31%	0.31%	0.00%
CO	33	9	7	3	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
DC	62	1		1	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
DE	333	13	11	2	15.38%	18.18%	0.00%	15.38%	18.18%	0.00%	7.69%	9.09%	0.00%
FL	315	217	42	196	4.15%	4.76%	3.57%	2.76%	4.76%	2.04%	2.76%	4.76%	2.04%
GA	2,460	1,161	1,052	109	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
HI	1,221	127	112	16	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
IA	1,908	1,002	963	39	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
IL	6,002	1,302	1,187	115	0.46%	0.25%	2.61%	0.38%	0.17%	2.61%	0.31%	0.17%	1.74%
IN	1,724	311	280	32	0.64%	0.71%	0.00%	0.64%	0.71%	0.00%	0.64%	0.71%	0.00%
KY	2,076	524	291	233	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
LA	22	13	9	4	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MA	2	2	1	1	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
MD	1,909	986	940	51	0.10%	0.00%	1.96%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MI	1	1	1	0	100.00%	100.00%	0.00%	100.00%	100.00%	0.00%	100.00%	100.00%	0.00%
MN	2,756	1,565	1,540	29	0.19%	0.19%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MO	323	85	71	14	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MS													
MT	1,624	565	523	57	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
NC	644	297	254	44	0.34%	0.39%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
NE	1	1	1	0	100.00%	100.00%	0.00%	100.00%	100.00%	0.00%	100.00%	100.00%	0.00%
NH													
NJ	3,130	1,511	1,486	25	0.40%	0.40%	0.00%	0.40%	0.40%	0.00%	0.40%	0.40%	0.00%
NM	1,595	590	555	35	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
NV	148	8	7	2	12.50%	14.29%	0.00%	12.50%	14.29%	0.00%	12.50%	14.29%	0.00%
NY	2,160	355	252	122	0.56%	0.40%	0.82%	0.56%	0.40%	0.82%	0.56%	0.40%	0.82%
OH	16,084	2,656	2,493	167	0.04%	0.04%	0.00%	0.04%	0.04%	0.00%	0.04%	0.04%	0.00%
SD	444	335	306	29	11.64%	11.11%	17.24%	0.30%	0.00%	3.45%	0.00%	0.00%	0.00%
TN	1,220	303	156	147	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
TX													
UT	1,328	423	403	34	1.65%	1.49%	2.94%	1.65%	1.49%	2.94%	1.42%	1.24%	2.94%
VI	10	3	0	3	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
VT	1	1	1	0	100.00%	100.00%	0.00%	100.00%	100.00%	0.00%	100.00%	100.00%	0.00%
WA	3,987	992	937	77	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
WV	388	137	63	75	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
WY	313	145	116	38	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
TOTAL	70,784	20,899	19,054	2,019	0.48%	0.42%	1.04%	0.26%	0.22%	0.64%	0.24%	0.20%	0.54%
24 States	67,688	20,407	18,693	1,867	0.45%	0.39%	1.02%	0.22%	0.18%	0.59%	0.20%	0.17%	0.48%

PWS = Public Water System; GW = Ground Water; SW = Surface Water; "% PWS ≥ MRL", "> ½ HRL", and "> HRL" are the proportion of systems with at least one analytic result equal to or greater than the MRL, exceeding the ½ HRL benchmark, and exceeding the HRL benchmark, respectively.

- The highlighted States are part of the 24-State Round 1 Cross-Section.
- The HRL used for 1,1,2,2-Tetrachloroethane is 0.4 µg/L. This is a draft value for working review only.

Table B.2.c. Round 1 Data - 1,1,2,2-Tetrachloroethane Occurrence in Public Water Systems - Based on Population Served

STATE	TOTAL POP SERVED	GW POP SERVED	SW POP SERVED	% POP ≥ MRL	% GW POP ≥ MRL	% SW POP ≥ MRL	% POP > ½ HRL	% GW POP > ½ HRL	% SW POP > ½ HRL	% POP > HRL	% GW POP > HRL	% SW POP > HRL
AK	1,126	1,126	0	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
AL	2,417,639	1,195,423	1,514,944	25.48%	1.34%	39.61%	25.48%	1.34%	39.61%	25.48%	1.34%	39.61%
AR												
AZ	4,001,762	1,323,094	2,909,062	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
CA	26,356,783	26,085,197	841,643	1.92%	1.94%	0.00%	1.92%	1.94%	0.00%	1.92%	1.94%	0.00%
CO	1,681,658	644,700	1,290,958	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
DC												
DE	499,732	266,732	233,000	40.94%	76.71%	0.00%	40.94%	76.71%	0.00%	34.38%	64.41%	0.00%
FL	4,315,466	1,745,246	3,704,774	0.64%	1.54%	0.01%	0.63%	1.54%	0.01%	0.63%	1.54%	0.01%
GA	4,919,208	1,373,936	3,545,272	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
HI	1,260,603	1,215,122	81,837	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
IA	2,128,421	1,499,541	628,880	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
IL	7,228,378	2,442,436	4,785,942	3.11%	6.02%	1.63%	1.15%	0.21%	1.63%	0.78%	0.21%	1.07%
IN	2,287,534	820,099	1,484,247	4.95%	13.80%	0.00%	4.95%	13.80%	0.00%	4.95%	13.80%	0.00%
KY	3,134,692	241,389	2,893,303	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
LA	240,115	58,905	181,210	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MA	15,725	6,425	9,300	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
MD	4,849,911	864,423	4,068,878	0.23%	0.00%	0.27%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MI	131,546	131,546	0	100.00%	100.00%	0.00%	100.00%	100.00%	0.00%	100.00%	100.00%	0.00%
MN	2,303,765	2,158,522	175,509	0.01%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MO	890,030	717,341	172,689	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MS												
MT	549,172	276,682	334,304	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
NC	1,109,397	452,814	656,833	0.07%	0.18%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
NE	985	985	0	100.00%	100.00%	0.00%	100.00%	100.00%	0.00%	100.00%	100.00%	0.00%
NH												
NJ	5,246,072	1,675,358	3,570,714	0.85%	2.65%	0.00%	0.85%	2.65%	0.00%	0.85%	2.65%	0.00%
NM	1,361,172	1,162,879	198,293	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
NV	70,910	63,410	34,560	6.70%	7.49%	0.00%	6.70%	7.49%	0.00%	6.70%	7.49%	0.00%
NY	27,880	9,880	24,500	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
OH	8,745,892	3,554,348	5,262,754	0.001%	0.002%	0.00%	0.001%	0.002%	0.00%	0.00%	0.00%	0.00%
SD	510,708	230,535	280,173	4.87%	4.28%	5.36%	2.73%	0.00%	4.98%	0.00%	0.00%	0.00%
TN	3,915,111	1,240,820	2,674,291	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
TX												
UT	3,116,052	2,289,457	1,746,978	6.19%	6.67%	2.30%	6.19%	6.67%	2.30%	5.77%	6.10%	2.30%
VI	66,000	0	66,000	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
VT	40	40	0	100.00%	100.00%	0.00%	100.00%	100.00%	0.00%	100.00%	100.00%	0.00%
WA	3,801,040	3,462,027	1,547,480	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
WV	777,629	187,714	594,025	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
WY	372,532	265,456	263,806	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
TOTAL	98,334,686	57,663,608	45,776,159	2.16%	2.37%	1.65%	1.99%	2.10%	1.62%	1.90%	2.02%	1.53%
24 States	94,710,065	55,763,644	43,763,942	1.86%	1.82%	1.70%	1.69%	1.55%	1.67%	1.63%	1.53%	1.58%

PWS = Public Water System; GW = Ground Water; SW = Surface Water; "% POP ≥ MRL", "> ½ HRL", and "> HRL" are the proportion of the total population served by systems with at least one analytic result equal to or greater than the MRL, exceeding the ½ HRL benchmark, and exceeding the HRL benchmark, respectively.

- The highlighted States are part of the 24-State Round 1 Cross-Section.
- The HRL used for 1,1,2,2-Tetrachloroethane is 0.4 µg/L. This is a draft value for working review only.

Appendix C. Detailed Round 2 Data Summary for Metolachlor, 1,3-Dichloropropene and 1,1,2,2-Tetrachloroethane

Table C.1.a Round 2 Data - Metolachlor Occurrence in Public Water Systems - Based on Number of Samples
Table C.1.b Round 2 Data - Metolachlor Occurrence in Public Water Systems - Based on Number of Systems
Table C.1.c Round 2 Data - Metolachlor Occurrence in Public Water Systems - Based on Population Served

Table C.2.a Round 2 Data - 1,3-Dichloropropene Occurrence in Public Water Systems - Based on Number of Samples
Table C 2.b Round 2 Data - 1,3-Dichloropropene Occurrence in Public Water Systems - Based on Number of Systems
Table C 2.c Round 2 Data - 1,3-Dichloropropene Occurrence in Public Water Systems - Based on Population Served

Table C.3.a Round 2 Data - 1,1,2,2-Tetrachloroethane Occurrence in Public Water Systems - Based on Number of Samples
Table C.3.b Round 2 Data - 1,1,2,2-Tetrachloroethane Occurrence in Public Water Systems - Based on Number of Systems
Table C.3.c Round 2 Data - 1,1,2,2-Tetrachloroethane Occurrence in Public Water Systems - Based on Population Served

Table C.1.a. Round 2 Data - Metolachlor Occurrence in Public Water Systems - Based on Number of Samples

STATE	TOTAL UNIQUE PWS	TOTAL # SAMPLES	# GW SAMPLES	# SW SAMPLES	% TOTAL SAMPLES ≥ MRL	% GW SAMPLES ≥ MRL	% SW SAMPLES ≥ MRL	MIN VALUE (µg/L)	99% VALUE (µg/L)	MAX VALUE (µg/L)	MIN DETECTS (µg/L)	MEDIAN DETECTS (µg/L)
Tribes (06)	1	3	3	0	0.00%	0.00%	0.00%	< 0.07	< 0.07	< 0.07		
AK	17	23	19	4	0.00%	0.00%	0.00%	< 0.00	< 0.00	< 0.00		
AL												
AR	536	1,610	1,225	385	0.00%	0.00%	0.00%	< 0.00	< 0.00	< 0.00		
AZ												
CA												
CO	750	2,230	1,365	865	0.04%	0.00%	0.12%	< 0.00	< 0.00	0.60	0.60	0.60
CT	70	317	116	201	0.63%	1.72%	0.00%	< 0.00	< 0.00	4.40	0.59	2.50
IN												
KY	38	156	65	91	7.69%	0.00%	13.19%	< 0.01	0.33	0.70	0.01	0.15
LA												
MA	54	182	72	110	8.79%	15.28%	4.55%	< 0.20	0.33	0.33	0.33	0.33
MD	683	1,135	913	222	0.18%	0.11%	0.45%	< 0.05	< 2.00	1.58	1.07	1.33
ME												
MI	2,650	4,162	3,780	382	0.17%	0.00%	1.83%	< 0.00	< 0.00	6.00	1.00	2.00
MN	1,264	5,985	5,706	279	0.37%	0.33%	1.08%	< 0.00	< 0.00	2.00	0.50	0.80
MO	538	1,798	780	1,018	2.34%	0.00%	4.13%	< 0.50	0.91	13.80	0.50	0.84
MS												
NC	495	730	694	36	0.14%	0.14%	0.00%	< 0.00	< 0.00	0.70	0.70	0.70
ND	296	384	317	67	0.00%	0.00%	0.00%	< 0.00	< 0.07	< 0.07		
NH	592	612	577	35	0.00%	0.00%	0.00%	< 0.00	< 0.00	< 0.00		
NJ												
NM	716	4,288	4,094	194	0.00%	0.00%	0.00%	< 0.03	< 0.20	< 0.20		
OH	2,202	5,386	4,901	485	0.48%	0.02%	5.15%	< 0.01	< 5.00	10.10	0.20	1.20
OK	1	1	0	1	0.00%	0.00%	0.00%	< 0.00	< 0.00	< 0.00		
OR	1,135	2,528	1,972	556	0.04%	0.05%	0.00%	< 0.00	< 0.00	1.00	1.00	1.00
PA	459	2,012	1,157	855	7.55%	6.57%	8.89%	< 0.00	3.00	3.00	0.03	1.00
RI	15	188	82	106	3.72%	8.54%	0.00%	< 0.00	0.61	0.75	0.17	0.33
SC	940	5,692	4,699	993	0.00%	0.00%	0.00%	< 0.00	< 0.00	< 0.00		
SD												
TN	10	50	16	34	0.00%	0.00%	0.00%	< 0.00	< 0.00	< 0.00		
TX	426	1,545	194	1,351	4.79%	2.58%	5.11%	< 0.10	0.67	7.10	0.10	0.30
VT	391	612	483	129	0.16%	0.21%	0.00%	< 0.00	< 0.00	0.10	0.10	0.10
WA	599	1,169	967	202	0.00%	0.00%	0.00%	< 0.00	< 0.00	< 0.00		
WI												
TOTAL	14,878	42,798	34,197	8,601	0.86%	0.37%	2.80%	< 0.00	< 5.00	13.80	0.01	1.00
20 STATES	13,007	34,112	27,723	6,389	0.62%	0.17%	2.58%	< 0.00	< 5.00	13.80	0.01	0.57
19 STATES[1]	12,953	33,930	27,651	6,279	0.57%	0.13%	2.55%	< 0.00	< 5.00	13.80	0.01	0.61

PWS = Public Water System; GW = Ground Water; SW = Surface Water; MRL= Minimum Reporting Limit; Min, 99%, and Max Value = the minimum, the 99th percentile value, and the maximum value of all samples; Min and Median Detects = the minimum and median of all sample detects.

- Massachusetts data not included in "19 States" summary statistics for Metolachlor. See text for details.
- The highlighted States are part of the 20-State Round 2 Cross-Section.
- Less-than (<) values indicate MRL values. Some systems did not report MRL values. In the data, these MRL values are represented by zeros (e.g "< 0.00").

Table C.1.b. Round 2 Data - Metolachlor Occurrence in Public Water Systems - Based on Number of Systems

STATE	TOTAL # SAMPLES	TOTAL UNIQUE PWS	# GW PWS	# SW PWS	% PWS ≥ MRL	% GW PWS ≥ MRL	% SW PWS ≥ MRL	% PWS > ½ HRL	% GW PWS > ½ HRL	% SW PWS > ½ HRL	% PWS > HRL	% GW PWS > HRL	% SW PWS > HRL
Tribes (06)	3	1	1	0	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
AK	23	17	14	3	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
AL													
AR	1,610	536	431	105	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
AZ													
CA													
CO	2,230	750	538	212	0.13%	0.00%	0.47%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
CT	317	70	35	35	1.43%	2.86%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
IN													
KY	156	38	18	20	13.16%	0.00%	25.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
LA													
MA	182	54	27	27	14.81%	14.81%	14.81%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MD	1,135	683	626	57	0.29%	0.16%	1.75%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
ME													
MI	4,162	2,650	2,570	80	0.19%	0.00%	6.25%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MN	5,985	1,264	1,234	30	0.40%	0.32%	3.33%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MO	1,798	538	437	101	4.28%	0.00%	22.77%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MS													
NC	730	495	470	25	0.20%	0.21%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
ND	384	296	258	38	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
NH	612	592	559	33	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
NJ													
NM	4,288	716	687	29	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
OH	5,386	2,202	2,021	181	1.00%	0.05%	11.60%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
OK	1	1	0	1	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
OR	2,528	1,135	984	151	0.09%	0.10%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
PA	2,012	459	313	146	13.07%	8.95%	21.92%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
RI	188	15	6	9	20.00%	50.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SC	5,692	940	842	98	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SD													
TN	50	10	2	8	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
TX	1,545	426	121	305	9.39%	1.65%	12.46%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
VT	612	391	339	52	0.26%	0.29%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
WA	1,169	599	529	70	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
WI													
TOTAL	42,798	14,878	13,062	1,816	1.20%	0.36%	7.21%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
20 STATES	34,112	13,007	11,530	1,477	0.89%	0.15%	6.70%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
19 STATES[1]	33,930	12,953	11,503	1,450	0.83%	0.11%	6.55%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

PWS = Public Water System; GW = Ground Water; SW = Surface Water; "% PWS ≥ MRL" is the proportion of systems with at least one analytic result equal to or greater than the MRL.

- Massachusetts data not included in "19 States" summary statistics for Metolachlor.
- The highlighted States are part of the 20-State Round 2 Cross-Section.
- The HRL used for metolachlor is 70 µg/L. This is a draft value for working review only.

Table C.1.c. Round 2 Data - Metolachlor Occurrence in Public Water Systems - Based on Population Served

STATE	TOTAL POP SERVED	GW POP SERVED	SW POP SERVED	% POP ≥ MRL	% GW POP ≥ MRL	% SW POP ≥ MRL	% POP > ½ HRL	% GW POP > ½ HRL	% SW POP > ½ HRL	% POP > HRL	% GW POP > HRL	% SW POP > HRL
Tribes (06)	9,500	9,500	0	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
AK	26,647	25,947	700	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
AL												
AR	1,549,257	791,316	757,941	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
AZ												
CA												
CO	3,530,819	404,353	3,126,466	0.04%	0.00%	0.05%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
CT	1,802,411	160,372	1,642,039	0.73%	8.19%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
IN												
KY	184,262	5,795	178,467	30.10%	0.00%	31.08%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
LA												
MA	885,780	107,685	778,095	13.47%	16.00%	13.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MD	4,350,399	487,444	3,862,955	0.13%	0.12%	0.13%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
ME												
MI	4,154,030	1,879,382	2,274,648	1.23%	0.00%	2.25%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MN	3,399,893	2,139,231	1,260,662	0.38%	0.07%	0.91%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MO	1,732,871	590,275	1,142,596	9.94%	0.00%	15.08%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MS												
NC	651,824	485,104	166,720	2.74%	3.68%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
ND	478,189	227,270	250,919	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
NH	441,328	138,778	302,550	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
NJ												
NM	1,352,305	1,211,125	141,180	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
OH	8,917,037	3,102,837	5,814,200	5.50%	0.00%	8.43%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
OK	2,989	0	2,989	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
OR	2,287,248	698,065	1,589,183	0.00%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
PA	6,104,554	345,376	5,759,178	48.02%	12.41%	50.15%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
RI	722,671	101,600	621,071	9.62%	68.41%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SC	2,570,542	735,470	1,835,072	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SD												
TN	260,764	3,014	257,750	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
TX	10,304,341	561,815	9,742,526	44.41%	1.76%	46.86%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
VT	369,364	108,156	261,208	0.07%	0.24%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
WA	3,012,463	1,429,290	1,583,173	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
WI												
TOTAL	59,101,488	15,749,200	43,352,288	14.41%	1.10%	19.25%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
20 STATES	47,984,353	14,387,312	33,597,041	11.61%	0.81%	16.24%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
19 STATES[1]	47,098,573	14,279,627	32,818,946	11.58%	0.70%	16.31%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

PWS = Public Water System; GW = Ground Water; SW = Surface Water; "% POP ≥ MRL" is the proportion of the total population served by systems with at least one analytic result equal to or greater than the MRL.

- Massachusetts data not included in "19 States" summary statistics for Metolachlor.
- The highlighted States are part of the 20-State Round 2 Cross-Section.
- The HRL used for metolachlor is 70 µg/L. This is a draft value for working review only.

Table C.2.a. Round 2 Data - 1,3-Dichloropropene Occurrence in Public Water Systems - Based on Number of Samples

STATE	TOTAL UNIQUE PWS	TOTAL # SAMPLES	# GW SAMPLES	# SW SAMPLES	% TOTAL SAMPLES ≥ MRL	% GW SAMPLES ≥ MRL	% SW SAMPLES ≥ MRL	MIN VALUE (µg/L)	99% VALUE (µg/L)	MAX VALUE (µg/L)	MIN DETECTS (µg/L)	MEDIAN DETECTS (µg/L)
Tribes (06)	21	30	29	1	0.00%	0.00%	0.00%	< 0.50	< 1.00	< 1.00		
AK	625	3,535	2,596	939	0.03%	0.04%	0.00%	< 0.00	< 0.00	39.00	39.00	39.00
AL												
AR	407	1,352	1,078	274	0.00%	0.00%	0.00%	< 0.00	< 0.08	< 0.08		
AZ												
CA	16	81	61	20	0.00%	0.00%	0.00%	< 0.20	< 0.50	< 0.50		
CO	831	2,643	1,693	950	0.00%	0.00%	0.00%	< 0.00	< 0.00	< 0.00		
CT	86	2,265	934	1,331	0.04%	0.00%	0.08%	< 0.00	< 0.00	0.35	0.35	0.35
IN	86	153	147	6	0.00%	0.00%	0.00%	< 0.10	< 1.00	< 1.00		
KY	181	354	128	226	0.00%	0.00%	0.00%	< 0.10	< 1.00	< 1.00		
LA	1,310	4,055	3,451	604	0.00%	0.00%	0.00%	< 0.50	< 0.50	< 0.50		
MA	419	1,822	1,371	451	0.05%	0.07%	0.00%	< 0.00	< 0.50	0.99	0.99	0.99
MD	976	4,871	4,320	551	0.02%	0.02%	0.00%	< 0.50	< 0.50	0.60	0.60	0.60
ME	744	3,540	3,138	402	0.00%	0.00%	0.00%	< 0.00	< 0.00	< 0.00		
MI	2,735	13,929	12,281	1,648	0.00%	0.00%	0.00%	< 0.00	< 0.00	< 0.00		
MN	1,480	6,381	6,205	176	1.00%	0.81%	7.95%	< 0.00	0.20	22.00	0.20	0.40
MO	1,053	1,071	980	91	0.00%	0.00%	0.00%	< 0.00	< 0.00	< 0.00		
MS												
NC	1,505	2,854	2,455	399	0.32%	0.29%	0.50%	< 0.00	< 0.00	0.50	0.50	0.50
ND	296	382	316	66	0.00%	0.00%	0.00%	< 0.00	< 1.00	< 1.00		
NH	687	944	898	46	0.00%	0.00%	0.00%	< 0.00	< 0.00	< 0.00		
NJ	12	15	12	3	0.00%	0.00%	0.00%	< 0.14	< 1.61	< 1.61		
NM	718	4,830	4,613	217	0.00%	0.00%	0.00%	< 0.50	< 1.00	< 1.00		
OH	2,232	17,788	16,432	1,356	0.02%	0.02%	0.00%	< 0.50	< 0.50	1.60	0.62	1.15
OK												
OR	1,081	2,617	2,071	546	0.04%	0.00%	0.18%	< 0.00	< 0.00	0.50	0.50	0.50
PA												
RI	102	291	241	50	0.00%	0.00%	0.00%	< 0.00	< 1.00	< 1.00		
SC												
SD	23	28	22	6	0.00%	0.00%	0.00%	< 0.50	< 0.50	< 0.50		
TN	77	533	191	342	0.00%	0.00%	0.00%	< 0.00	< 0.00	< 0.00		
TX												
VT	526	1,597	1,405	192	0.00%	0.00%	0.00%	< 0.00	< 0.00	< 0.00		
WA	715	1,427	1,279	148	0.00%	0.00%	0.00%	< 0.00	< 0.00	< 0.00		
WI												
TOTAL	18,944	79,388	68,347	11,041	0.10%	0.09%	0.16%	< 0.00	< 0.50	39.00	0.20	0.50
20 STATES	16,787	70,631	62,095	8,536	0.11%	0.10%	0.20%	< 0.00	< 0.50	39.00	0.20	0.50

PWS = Public Water System; GW = Ground Water; SW = Surface Water; MRL= Minimum Reporting Limit; Min, 99%, and Max Value = the minimum, the 99th percentile value, and the maximum value of all samples; Min and Median Detects = the minimum and median of all sample detects.

- The highlighted States are part of the 20-State Round 2 Cross-Section.

- Less-than (<) values indicate MRL values. Some systems did not report MRL values. In the data, these MRL values are represented by zeros (e.g "< 0.00").

Table C.2.b. Round 2 Data - 1,3-Dichloropropene Occurrence in Public Water Systems - Based on Number of Systems

STATE	TOTAL # SAMPLES	TOTAL UNIQUE PWS	# GW PWS	# SW PWS	% PWS ≥ MRL	% GW PWS ≥ MRL	% SW PWS ≥ MRL	% PWS > ½ HRL	% GW PWS > ½ HRL	% SW PWS > ½ HRL	% PWS > HRL	% GW PWS > HRL	% SW PWS > HRL
Tribes (06)	30	21	20	1	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
AK	3,535	625	481	144	0.16%	0.21%	0.00%	0.16%	0.21%	0.00%	0.16%	0.21%	0.00%
AL													
AR	1,352	407	319	88	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
AZ													
CA	81	16	12	4	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
CO	2,643	831	619	212	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
CT	2,265	86	44	42	1.16%	0.00%	2.38%	1.16%	0.00%	2.38%	0.00%	0.00%	0.00%
IN	153	86	80	6	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
KY	354	181	84	97	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
LA	4,055	1,310	1,241	69	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MA	1,822	419	345	74	0.24%	0.29%	0.00%	0.24%	0.29%	0.00%	0.24%	0.29%	0.00%
MD	4,871	976	920	56	0.10%	0.11%	0.00%	0.10%	0.11%	0.00%	0.10%	0.11%	0.00%
ME	3,540	744	676	68	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MI	13,929	2,735	2,644	91	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MN	6,381	1,480	1,450	30	2.91%	2.48%	23.33%	2.36%	2.00%	20.00%	1.55%	1.17%	20.00%
MO	1,071	1,053	964	89	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MS													
NC	2,854	1,505	1,329	176	0.53%	0.45%	1.14%	0.53%	0.45%	1.14%	0.53%	0.45%	1.14%
ND	382	296	258	38	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
NH	944	687	656	31	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
NJ	15	12	10	2	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
NM	4,830	718	692	26	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
OH	17,788	2,232	2,050	182	0.13%	0.15%	0.00%	0.13%	0.15%	0.00%	0.13%	0.15%	0.00%
OK													
OR	2,617	1,081	931	150	0.09%	0.00%	0.67%	0.09%	0.00%	0.67%	0.09%	0.00%	0.67%
PA													
RI	291	102	92	10	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SC													
SD	28	23	17	6	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
TN	533	77	30	47	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
TX													
VT	1,597	526	466	60	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
WA	1,427	715	668	47	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
WI													
TOTAL	79,388	18,944	17,098	1,846	0.31%	0.28%	0.60%	0.27%	0.24%	0.54%	0.20%	0.17%	0.49%
20 STATES	70,631	16,787	15,178	1,609	0.35%	0.32%	0.62%	0.30%	0.27%	0.56%	0.23%	0.19%	0.56%

PWS = Public Water System; GW = Ground Water; SW = Surface Water; "% PWS ≥ MRL", "> ½ HRL", and "> HRL" are the proportion of systems with at least one analytic result equal to or greater than the MRL, exceeding the ½ HRL benchmark, and exceeding the HRL benchmark, respectively.

- The highlighted States are part of the 20-State Round 2 Cross-Section.

- The HRL used for 1,3-Dichloropropene is 0.4 µg/L. This is a draft value for working review only.

Table C.2.c. Round 2 Data - 1,3-Dichloropropene Occurrence in Public Water Systems - Based on Population Served

STATE	TOTAL POP SERVED	GW POP SERVED	SW POP SERVED	% POP ≥ MRL	% GW POP ≥ MRL	% SW POP ≥ MRL	% POP > ½ HRL	% GW POP > ½ HRL	% SW POP > ½ HRL	% POP > HRL	% GW POP > HRL	% SW POP > HRL
Tribes (06)	49,986	41,486	8,500	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
AK	480,068	204,976	275,092	0.83%	1.95%	0.00%	0.83%	1.95%	0.00%	0.83%	1.95%	0.00%
AL												
AR	1,301,907	612,648	689,259	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
AZ												
CA	1,171,659	529,897	641,762	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
CO	3,576,561	440,514	3,136,047	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
CT	2,330,321	211,367	2,118,954	0.32%	0.00%	0.35%	0.32%	0.00%	0.35%	0.00%	0.00%	0.00%
IN	392,657	349,013	43,644									
KY	2,212,474	179,998	2,032,476	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
LA	4,535,907	2,598,561	1,937,346	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MA	3,402,403	1,326,669	2,075,734	0.01%	0.03%	0.00%	0.01%	0.03%	0.00%	0.01%	0.03%	0.00%
MD	5,012,575	671,808	4,340,767	0.004%	0.03%	0.00%	0.004%	0.03%	0.00%	0.004%	0.03%	0.00%
ME	675,407	244,096	431,311	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MI	3,237,068	1,920,249	1,316,819	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MN	3,622,825	2,362,163	1,260,662	5.78%	7.43%	2.69%	4.13%	5.06%	2.37%	2.99%	3.31%	2.37%
MO	1,554,953	1,131,780	423,173	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MS												
NC	4,690,803	1,186,827	3,503,976	0.55%	0.59%	0.54%	0.55%	0.59%	0.54%	0.55%	0.59%	0.54%
ND	478,189	227,270	250,919	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
NH	476,008	169,280	306,728	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
NJ	27,774	5,374	22,400	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
NM	1,351,088	1,212,253	138,835	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
OH	9,095,427	3,311,171	5,784,256	0.11%	0.30%	0.00%	0.11%	0.30%	0.00%	0.11%	0.30%	0.00%
OK												
OR	1,820,043	690,965	1,129,078	0.16%	0.00%	0.26%	0.16%	0.00%	0.26%	0.16%	0.00%	0.26%
PA												
RI	689,332	112,386	576,946	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SC												
SD	44,854	21,240	23,614	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
TN	792,356	105,819	686,537	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
TX												
VT	417,057	160,828	256,229	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
WA	2,273,921	1,417,977	855,944	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
WI												
TOTAL	55,713,623	21,446,615	34,267,008	0.47%	0.92%	0.18%	0.36%	0.66%	0.17%	0.27%	0.47%	0.15%
20 STATES	45,951,052	17,423,030	28,528,022	0.55%	1.13%	0.19%	0.42%	0.81%	0.18%	0.33%	0.57%	0.18%

PWS = Public Water System; GW = Ground Water; SW = Surface Water; "% POP ≥ MRL", "> ½ HRL", and "> HRL" are the proportion of the total population served by systems with at least one analytic result equal to or greater than the MRL, exceeding the ½ HRL benchmark, and exceeding the HRL benchmark, respectively.

- The highlighted States are part of the 20-State Round 2 Cross-Section.
- The HRL used for 1,3-Dichloropropene is 0.4 µg/L. This is a draft value for working review only.

Table C.3.a. Round 2 Data - 1,1,2,2-Tetrachloroethane Occurrence in Public Water Systems - Based on Number of Samples

STATE	TOTAL UNIQUE PWS	TOTAL # SAMPLES	# GW SAMPLES	# SW SAMPLES	% TOTAL SAMPLES ≥ MRL	% GW SAMPLES ≥ MRL	% SW SAMPLES ≥ MRL	MIN VALUE (µg/L)	99% VALUE (µg/L)	MAX VALUE (µg/L)	MIN DETECTS (µg/L)	MEDIAN DETECTS (µg/L)
Tribes (06)	22	32	31	1	0.00%	0.00%	0.00%	< 0.50	< 1.00	< 1.00		
AK	625	3,548	2,604	944	0.00%	0.00%	0.00%	< 0.00	< 0.00	< 0.00		
AL												
AR	407	1,352	1,078	274	0.00%	0.00%	0.00%	< 0.00	< 0.10	< 0.10		
AZ	121	244	172	72	0.00%	0.00%	0.00%	< 0.20	< 2.00	< 2.00		
CA	16	81	61	20	0.00%	0.00%	0.00%	< 0.20	< 0.50	< 0.50		
CO	831	2,643	1,693	950	0.00%	0.00%	0.00%	< 0.00	< 0.00	< 0.00		
CT	86	2,280	918	1,362	0.53%	0.22%	0.73%	< 0.00	< 0.00	3.90	0.06	0.12
IN	69	142	129	13	0.00%	0.00%	0.00%	< 0.50	< 2.00	< 2.00		
KY	433	1,972	899	1,073	0.00%	0.00%	0.00%	< 0.10	< 2.50	< 2.50		
LA	1,310	4,055	3,451	604	0.00%	0.00%	0.00%	< 0.50	< 0.50	< 0.50		
MA	418	1,823	1,372	451	0.05%	0.07%	0.00%	< 0.00	< 0.50	1.40	1.40	1.40
MD	976	4,869	4,319	550	0.02%	0.00%	0.18%	< 0.10	< 0.50	0.50	0.10	0.10
ME	744	3,559	3,154	405	0.03%	0.00%	0.25%	< 0.00	< 0.00	2.00	2.00	2.00
MI	2,735	6,965	6,141	824	0.01%	0.02%	0.00%	< 0.00	< 0.00	0.50	0.50	0.50
MN	1,558	6,864	6,678	186	0.00%	0.00%	0.00%	< 0.00	< 0.20	< 0.40		
MO	1,413	3,773	3,275	498	0.00%	0.00%	0.00%	< 0.00	< 1.00	< 1.00		
MS												
NC	1,785	3,393	2,906	487	0.32%	0.31%	0.41%	< 0.00	< 0.00	0.50	0.50	0.50
ND	296	382	316	66	0.00%	0.00%	0.00%	< 0.00	< 0.50	< 0.50		
NH	681	935	892	43	0.00%	0.00%	0.00%	< 0.00	< 0.00	< 0.00		
NJ	16	19	16	3	0.00%	0.00%	0.00%	< 0.23	< 1.32	< 1.32		
NM	716	4,820	4,602	218	0.00%	0.00%	0.00%	< 0.50	< 1.00	< 1.00		
OH	2,232	17,788	16,432	1,356	0.01%	0.01%	0.00%	< 0.50	< 0.50	0.56	0.50	0.53
OK	792	4,746	3,492	1,254	0.02%	0.00%	0.08%	< 0.00	< 0.00	0.80	0.80	0.80
OR	1,085	2,658	2,096	562	0.00%	0.00%	0.00%	< 0.00	< 0.00	< 0.00		
PA												
RI	114	423	338	85	0.00%	0.00%	0.00%	< 0.00	< 1.00	< 1.00		
SC	907	3,984	3,424	560	0.00%	0.00%	0.00%	< 0.00	< 0.50	< 0.50		
SD	27	35	26	9	0.00%	0.00%	0.00%	< 0.50	< 0.50	< 0.50		
TN	77	531	191	340	0.00%	0.00%	0.00%	< 0.00	< 0.00	< 0.00		
TX	4,412	16,849	12,190	4,659	0.01%	0.00%	0.04%	< 1.00	< 1.00	1.60	1.50	1.55
VT	558	1,806	1,600	206	0.00%	0.00%	0.00%	< 0.00	< 0.00	< 0.50		
WA	2,547	9,549	8,665	884	0.01%	0.00%	0.11%	< 0.00	< 0.00	0.30	0.30	0.30
WI	200	360	356	4	0.00%	0.00%	0.00%	< 0.00	< 3.00	< 3.00		
TOTAL	28,209	112,480	93,517	18,963	0.03%	0.02%	0.09%	< 0.00	< 1.00	3.90	0.06	0.50
20 STATES	24,800	98,911	83,142	15,769	0.02%	0.02%	0.05%	< 0.00	< 1.00	2.00	0.10	0.50

PWS = Public Water System; GW = Ground Water; SW = Surface Water; MRL= Minimum Reporting Limit; Min, 99%, and Max Value = the minimum, the 99th percentile value, and the maximum value of all samples; Min and Median Detects = the minimum and median of all sample detects.

- The highlighted States are part of the 20-State Round 2 Cross-Section.
- Less-than (<) values indicate MRL values. Some systems did not report MRL values. In the data, these MRL values are represented by zeros (e.g "< 0.00").

Table C.3.b. Round 2 Data - 1,1,2,2-Tetrachloroethane Occurrence in Public Water Systems - Based on Number of Systems

STATE	TOTAL # SAMPLES	TOTAL UNIQUE PWS	# GW PWS	# SW PWS	% PWS ≥ MRL	% GW PWS ≥ MRL	% SW PWS ≥ MRL	% PWS > ½ HRL	% GW PWS > ½ HRL	% SW PWS > ½ HRL	% PWS > HRL	% GW PWS > HRL	% SW PWS > HRL
Tribes (06)	32	22	21	1	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
AK	3,548	625	481	144	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
AL													
AR	1,352	407	319	88	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
AZ	244	121	106	15	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
CA	81	16	12	4	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
CO	2,643	831	619	212	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
CT	2,280	86	44	42	3.49%	4.55%	2.38%	1.16%	2.27%	0.00%	1.16%	2.27%	0.00%
IN	142	69	62	7	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
KY	1,972	433	208	225	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
LA	4,055	1,310	1,241	69	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MA	1,823	418	344	74	0.24%	0.29%	0.00%	0.24%	0.29%	0.00%	0.24%	0.29%	0.00%
MD	4,869	976	920	56	0.10%	0.00%	1.79%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
ME	3,559	744	676	68	0.13%	0.00%	1.47%	0.13%	0.00%	1.47%	0.13%	0.00%	1.47%
MI	6,965	2,735	2,644	91	0.04%	0.04%	0.00%	0.04%	0.04%	0.00%	0.04%	0.04%	0.00%
MN	6,864	1,558	1,528	30	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MO	3,773	1,413	1,297	116	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MS													
NC	3,393	1,785	1,592	193	0.50%	0.44%	1.04%	0.50%	0.44%	1.04%	0.50%	0.44%	1.04%
ND	382	296	258	38	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
NH	935	681	651	30	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
NJ	19	16	14	2	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
NM	4,820	716	689	27	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
OH	17,788	2,232	2,050	182	0.09%	0.10%	0.00%	0.09%	0.10%	0.00%	0.09%	0.10%	0.00%
OK	4,746	792	541	251	0.13%	0.00%	0.40%	0.13%	0.00%	0.40%	0.13%	0.00%	0.40%
OR	2,658	1,085	934	151	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
PA													
RI	423	114	102	12	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SC	3,984	907	806	101	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SD	35	27	19	8	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
TN	531	77	30	47	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
TX	16,849	4,412	3,825	587	0.05%	0.00%	0.34%	0.05%	0.00%	0.34%	0.05%	0.00%	0.34%
VT	1,806	558	494	64	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
WA	9,549	2,547	2,428	119	0.04%	0.00%	0.84%	0.04%	0.00%	0.84%	0.00%	0.00%	0.00%
WI	360	200	197	3	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
TOTAL	112,480	28,209	25,152	3,057	0.08%	0.05%	0.29%	0.07%	0.05%	0.23%	0.06%	0.05%	0.20%
20 STATES	98,911	24,800	22,106	2,694	0.08%	0.05%	0.30%	0.07%	0.05%	0.26%	0.07%	0.05%	0.22%

PWS = Public Water System; GW = Ground Water; SW = Surface Water; "% PWS ≥ MRL", "> ½ HRL", and "> HRL" are the proportion of systems with at least one analytic result equal to or greater than the MRL, exceeding the ½ HRL benchmark, and exceeding the HRL benchmark, respectively.

- The highlighted States are part of the 20-State Round 2 Cross-Section.
- The HRL used for 1,1,2,2-Tetrachloroethane is 0.4 µg/L. This is a draft value for working review only.

Table C.3.c. Round 2 Data - 1,1,2,2-Tetrachloroethane Occurrence in Public Water Systems - Based on Population Served

STATE	TOTAL POP SERVED	GW POP SERVED	SW POP SERVED	% POP ≥ MRL	% GW POP ≥ MRL	% SW POP ≥ MRL	% POP > ½ HRL	% GW POP > ½ HRL	% SW POP > ½ HRL	% POP > HRL	% GW POP > HRL	% SW POP > HRL
Tribes (06)	51,486	42,986	8,500	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
AK	480,068	204,976	275,092	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
AL												
AR	1,301,907	612,648	689,259	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
AZ	862,408	181,619	680,789	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
CA	1,171,659	529,897	641,762	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
CO	3,576,561	440,514	3,136,047	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
CT	2,330,321	211,367	2,118,954	1.32%	12.98%	0.16%	0.42%	4.67%	0.00%	0.42%	4.67%	0.00%
IN	250,248	214,333	35,915									
KY	3,047,973	296,772	2,751,201	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
LA	4,535,907	2,598,561	1,937,346	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MA	3,401,953	1,326,219	2,075,734	0.03%	0.07%	0.00%	0.03%	0.07%	0.00%	0.03%	0.07%	0.00%
MD	5,012,575	671,808	4,340,767	29.92%	0.00%	34.56%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
ME	675,407	244,096	431,311	0.32%	0.00%	0.50%	0.32%	0.00%	0.50%	0.32%	0.00%	0.50%
MI	3,237,068	1,920,249	1,316,819	0.002%	0.003%	0.00%	0.002%	0.003%	0.00%	0.002%	0.003%	0.00%
MN	3,648,944	2,388,282	1,260,662	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MO	2,297,960	1,477,191	820,769	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MS												
NC	4,927,499	1,254,514	3,672,985	0.54%	0.62%	0.51%	0.54%	0.62%	0.51%	0.54%	0.62%	0.51%
ND	478,189	227,270	250,919	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
NH	466,045	168,817	297,228	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
NJ	28,130	5,730	22,400	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
NM	1,352,001	1,211,338	140,663	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
OH	9,095,427	3,311,171	5,784,256	0.17%	0.47%	0.00%	0.17%	0.47%	0.00%	0.17%	0.47%	0.00%
OK	3,012,419	639,513	2,372,906	0.02%	0.00%	0.03%	0.02%	0.00%	0.03%	0.02%	0.00%	0.03%
OR	2,280,323	691,245	1,589,078	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
PA												
RI	759,625	132,623	627,002	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SC	2,556,069	708,949	1,847,120	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SD	57,723	25,359	32,364	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
TN	792,356	105,819	686,537	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
TX	17,945,854	6,369,774	11,576,080	0.06%	0.00%	0.09%	0.06%	0.00%	0.09%	0.06%	0.00%	0.09%
VT	419,236	161,487	257,749	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
WA	4,296,465	2,389,339	1,907,126	7.12%	0.00%	16.05%	7.12%	0.00%	16.05%	0.00%	0.00%	0.00%
WI	342,561	305,110	37,451	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
TOTAL	84,692,367	31,069,576	53,622,791	2.23%	0.17%	3.43%	0.44%	0.11%	0.63%	0.08%	0.11%	0.06%
20 STATES	71,294,263	25,978,359	45,315,904	2.61%	0.09%	4.06%	0.51%	0.09%	0.75%	0.08%	0.09%	0.07%

PWS = Public Water System; GW = Ground Water; SW = Surface Water; "% POP ≥ MRL", "> ½ HRL", and "> HRL" are the proportion of the total population served by systems with at least one analytic result equal to or greater than the MRL, exceeding the ½ HRL benchmark, and exceeding the HRL benchmark, respectively.

- The highlighted States are part of the 20-State Round 2 Cross-Section.
- The HRL used for 1,1,2,2-Tetrachloroethane is 0.4 µg/L. This is a draft value for working review only.

Appendix D. Detailed NIRS Data Summary for Boron

Table D.1.a NIRS Data - Boron Occurrence in Public Water Systems

Table D.1. NIRS Data - Boron Occurrence in Public Water Systems

State	# Samples	# Samples ≥ MRL	% Samples ≥ MRL	# Detects > ½ HRL	% Detects > ½ HRL	# Detects > HRL	% Detects > HRL	Min Value (mg/L)	99% Value (mg/L)	Max Value (mg/L)	Min Detects (mg/L)	Median Detects (mg/L)
AK	8	7	87.50%		0.00%		0.00%	< 0.01	0.12	0.12	0.01	0.04
AL	8	3	37.50%		0.00%		0.00%	< 0.01	0.41	0.41	0.01	0.01
AR	9	9	100.00%		0.00%		0.00%	0.01	0.60	0.60	0.01	0.09
AZ	14	13	92.86%	1	7.14%		0.00%	< 0.01	1.00	1.00	0.01	0.04
CA	60	56	93.33%	5	8.33%	2	3.33%	< 0.01	3.89	3.89	0.01	0.07
CO	10	9	90.00%		0.00%		0.00%	< 0.01	0.22	0.22	0.01	0.04
CT	23	19	82.61%		0.00%		0.00%	< 0.01	0.14	0.14	0.01	0.02
DE	10	8	80.00%	1	10.00%		0.00%	< 0.01	0.89	0.89	0.01	0.01
FL	56	55	98.21%		0.00%		0.00%	< 0.01	0.24	0.24	0.01	0.02
GA	23	14	60.87%		0.00%		0.00%	< 0.01	0.06	0.06	0.01	0.01
IA	28	28	100.00%	1	3.57%	1	3.57%	0.01	1.44	1.44	0.01	0.06
ID	12	8	66.67%		0.00%		0.00%	< 0.01	0.13	0.13	0.01	0.04
IL	46	45	97.83%	7	15.22%	1	2.17%	< 0.01	1.63	1.63	0.01	0.32
IN	19	19	100.00%		0.00%		0.00%	0.01	0.22	0.22	0.01	0.08
KS	6	6	100.00%		0.00%		0.00%	0.02	0.27	0.27	0.02	0.07
KY	8	7	87.50%		0.00%		0.00%	< 0.01	0.12	0.12	0.01	0.02
LA	26	25	96.15%	3	11.54%	1	3.85%	< 0.01	2.82	2.82	0.01	0.05
MA	7	4	57.14%		0.00%		0.00%	< 0.01	0.02	0.02	0.01	0.01
MD	6	5	83.33%		0.00%		0.00%	< 0.01	0.68	0.68	0.08	0.13
ME	7	3	42.86%		0.00%		0.00%	< 0.01	0.03	0.03	0.01	0.01
MI	25	25	100.00%	1	4.00%		0.00%	0.01	0.79	0.79	0.01	0.04
MN	19	18	94.74%	1	5.26%		0.00%	< 0.01	1.11	1.11	0.01	0.18
MO	21	15	71.43%		0.00%		0.00%	< 0.01	0.63	0.63	0.01	0.04
MS	26	19	73.08%		0.00%		0.00%	< 0.01	0.50	0.50	0.01	0.13
MT	11	11	100.00%	1	9.09%		0.00%	0.01	1.21	1.21	0.01	0.12
NC	44	17	38.64%		0.00%		0.00%	< 0.01	0.64	0.64	0.01	0.02
ND	19	19	100.00%	7	36.84%	5	26.32%	0.02	3.95	3.95	0.02	0.49
NE	19	19	100.00%		0.00%		0.00%	0.01	0.22	0.22	0.01	0.05
NH	10	3	30.00%		0.00%		0.00%	< 0.01	0.06	0.06	0.01	0.02
NJ	6	1	16.67%		0.00%		0.00%	< 0.01	0.10	0.10	0.10	0.10
NM	7	7	100.00%		0.00%		0.00%	0.02	0.20	0.20	0.02	0.07
NV	2	2	100.00%		0.00%		0.00%	0.01	0.34	0.34	0.01	0.18
NY	57	43	75.44%	1	1.75%		0.00%	< 0.01	0.83	0.83	0.01	0.04
OH	25	25	100.00%		0.00%		0.00%	0.01	0.61	0.61	0.01	0.05
OK	12	12	100.00%		0.00%		0.00%	0.01	0.51	0.51	0.01	0.07
OR	8	7	87.50%		0.00%		0.00%	< 0.01	0.25	0.25	0.01	0.01
PA	36	29	80.56%		0.00%		0.00%	< 0.01	0.41	0.41	0.01	0.05
PR	1	1	100.00%		0.00%		0.00%	0.04	0.04	0.04	0.04	0.04
RI	1		0.00%		0.00%		0.00%	< 0.01	< 0.01	< 0.01		
SC	18	10	55.56%	1	5.56%	1	5.56%	< 0.01	2.44	2.44	0.01	0.01
SD	8	8	100.00%	2	25.00%	1	12.50%	0.06	2.87	2.87	0.06	0.25
TN	9	5	55.56%		0.00%		0.00%	< 0.01	0.04	0.04	0.01	0.01
TX	74	74	100.00%	8	10.81%	3	4.05%	0.01	3.15	3.15	0.01	0.17
UT	10	9	90.00%		0.00%		0.00%	< 0.01	0.16	0.16	0.01	0.03
VA	30	14	46.67%	2	6.67%	2	6.67%	< 0.01	2.12	2.12	0.01	0.14
VT	12	3	25.00%		0.00%		0.00%	< 0.01	0.02	0.02	0.01	0.01
WA	52	37	71.15%	1	1.92%		0.00%	< 0.01	0.93	0.93	0.01	0.02
WI	30	25	83.33%		0.00%		0.00%	< 0.01	0.59	0.59	0.01	0.02
WV	8	6	75.00%		0.00%		0.00%	< 0.01	0.12	0.12	0.01	0.03
WY	3	3	100.00%		0.00%		0.00%	0.03	0.39	0.39	0.03	0.06
Total	**989**	**810**	**81.90%**	**43**	**4.35%**	**17**	**1.72%**	**< 0.01**	**2.44**	**3.95**	**0.01**	**0.05**

PWS = Public Water System; GW = Ground Water; SW = Surface Water; MRL= Minimum Reporting Limit; "# (or %) PWS ≥ MRL", "> ½ HRL", and "> HRL" are the number (or proportion) of systems with at least one analytic result equal to or greater than the MRL, exceeding the ½ HRL benchmark, and exceeding the HRL benchmark, respectively; Min, 99%, and Max Value = the minimum, the 99th percentile value, and the maximum value of all samples; Min and Median Detects = the minimum and median of all sample detects.

- Only one sample was taken per system, so # samples = # systems.
- Less-than (<) values indicate MRL values.
- The HRL used for boron is 1.4 mg/L. This is a draft value for working review only.

Appendix E. Data Summaries of Occurrence and Population Served for Four Contaminants Considered During CCL 2 Regulatory Determinations

Table E.1. Boron Occurrence Summary Statistics in Ground Water Surveys (NIRS)

Table E.2. Metolachlor Occurrence Summary Statistics (Round 2)

Table E.3.a 1,3-Dichloropropene Occurrence Summary Statistics (Round 1)
Table A.3.b 1,3-Dichloropropene Occurrence Summary Statistics (Round 2)

Table E.4.a 1,1,2,2-Tetrachloroethane Occurrence Summary Statistics (Round 1)
Table E.4.b 1,1,2,2-Tetrachloroethane Occurrence Summary Statistics (Round 2)

Table E.1. Boron Occurrence Summary Statistics in Ground Water Surveys (NIRS)

Frequency Factors	**NIRS Data on Boron**		**National System & Population Numbers[1]**
Total Number of Samples/Systems	989		59,440
99th Percentile Concentration (all samples)	2.44 mg/L		--
Health Reference Level (HRL)	1.4 mg/L		--
Minimum Reporting Level (MRL)	0.005 mg/L		--
Maximum Concentration of Detections	3.95 mg/L		
99th Percentile Concentration of Detections	2.6 mg/L		--
Median Concentration of Detections	0.047 mg/L		--
Total Population Served	1,482,153		85,681,696
Occurrence by Sample/System	**Number**	**Percentage**	**National Extrapolation**
Ground Water PWSs with Detections (≥ MRL)	810	81.9%	48,682
Range of NIRS States	0 - 74	0 - 100%	N/A
Ground Water PWSs > ½ HRL	43	4.3%	2,584
Range of NIRS States	0 - 8	0 - 37%	N/A
Ground Water PWSs > HRL	17	1.7%	1,022
Range of NIRS States	0 - 5	0 - 26%	N/A
Occurrence by Population Served			
Population Served by GW PWSs with Detections	1,306,048	88.1%	75,501,000
Range of NIRS States	0 - 343,465	0 - 100%	N/A
Population Served by GW PWSs > ½ HRL	42,702	2.9%	2,469,000
Range of NIRS States	0 - 20,465	0 - 34%	N/A
Population Served by GW PWSs > HRL	6,443	0.4%	372,000
Range of NIRS States	0 - 2,500	0 - 34%	N/A

1. Total PWS and population numbers are from EPA's March 2000 Water Industry Baseline Handbook, 2nd Edition. National extrapolations are generated by multiplying the system/population percentages and the national Baseline Handbook system/population numbers.

Abbreviations:

PWS = Public Water Systems; GW = Ground Water; N/A = Not Applicable; Total Number of Samples/Systems = total number of samples/systems on record for the contaminant; 99th Percentile Concentration = the concentration in the 99th percentile sample (out of either all samples or just samples with detections); Median Concentration of Detections = the concentration in the median sample (out of samples with detections); Total Population Served = the total population served by PWSs for which sampling results are available; Ground Water PWSs with Detections, PWSs >½HRL, or PWSs >HRL = GW PWSs with at least one sampling result greater than or equal to the MRL, exceeding the ½HRL benchmark, or exceeding the HRL benchmark, respectively; Population Served by GW PWSs with Detections, by PWSs >½HRL, or by PWSs >HRL = population served by GW PWSs with at least one sampling result greater than or equal to the MRL, exceeding the ½HRL benchmark, or exceeding the HRL benchmark, respectively.

Notes:

- Only results at or above the MRL were reported as detections. Concentrations below the MRL are considered non-detects.
- The HRL used in this analysis is a draft value for working review only.

Table E.2. Metolachlor Occurrence Summary Statistics (Round 2)

Frequency Factors	19 State Cross-Section[1]		All Reporting States[2]		National System & Population Numbers[3]	
Total Number of Samples	33,930		42,798		--	
Percent of Samples with Detections	0.57%		0.86%		--	
99th Percentile Concentration (all samples)	< MRL		< MRL		--	
Health Reference Level (HRL)	70		70		--	
Minimum Reporting Level (MRL) - Range - (modal value)[4]	0.01 - 52 µg/L 0.2 µg/L		0.01 - 52 µg/L 0.1 µg/L		--	
Maximum Concentration of Detections	13.8 µg/L		13.8 µg/L		--	
99th Percentile Concentration of Detections	7.1 µg/L		6 µg/L		--	
Median Concentration of Detections	0.61 µg/L		1.0 µg/L		--	
Total Number of PWSs Number of GW PWSs Number of SW PWSs	12,953 11,503 1,450		14,878 13,062 1,816		65,030 59,440 5,590	
Total Population Population of GW PWSs Population of SW PWSs	47,098,573 14,279,627 32,818,946		59,101,488 15,749,200 43,352,288		213,008,182 85,681,696 127,326,486	
Occurrence by System	**Number**	**Percentage**	**Number**	**Percentage**	**National Extrapolation[5]**	
					Cross-Section	**All States**
PWSs with detections (≥ MRL) Range across States GW PWSs with detections SW PWSs with detections	108 0 - 40 13 95	0.83% 0 - 20.00% 0.11% 6.55%	178 0 - 60 47 131	1.20% 0 - 20.0% 0.36% 7.21%	542 N/A 67 366	778 N/A 214 403
PWSs > ½ HRL Range across States GW PWSs > ½ HRL SW PWSs > ½ HRL	0 0 0 0	0.00% 0.00% 0.00% 0.00%	0 0 0 0	0.00% 0.00% 0.00% 0.00%	0 0 0 0	0 N/A 0 0
PWSs > HRL Range across States GW PWSs > HRL SW PWSs > HRL	0 0 0 0	0.00% 0.00% 0.00% 0.00%	0 0 0 0	0.00% 0.00% 0.00% 0.00%	0 0 0 0	0 N/A 0 0
Occurrence by Population Served						
Population served by PWSs with detections Range across States Pop. Served by GW PWSs with detections Pop. Served by SW PWSs with detections	5,452,616 0 - 4,575,644 99,372 5,353,244	11.58% 0 - 44.41% 0.70% 16.31%	8,516,409 0 - 4,575,644 172,839 8,343,570	14.41% 0 - 48.02% 1.10% 19.25%	24,660,000 N/A 596,000 20,769,000	30,694,000 N/A 940,000 24,505,000
Population served by PWSs > ½ HRL Range across States Pop. Served by GW PWSs > ½ HRL Pop. Served by SW PWSs > ½ HRL	0 0 0 0	0.00% 0.00% 0.00% 0.00%	0 0 0 0	0.00% 0.00% 0.00% 0.00%	0 0 0 0	0 N/A 0 0
Population served by PWSs > HRL Range across States Pop. Served by GW PWSs > HRL Pop. Served by SW PWSs > HRL	0 0 0 0	0.00% 0.00% 0.00% 0.00%	0 0 0 0	0.00% 0.00% 0.00% 0.00%	0 0 0 0	0 N/A 0 0

1. Summary Results based on 19-State Cross-Section, UCM Round 2 data.
2. Summary Results based on All Reporting States, UCM Round 2 data.
3. Total PWS and population numbers are from EPA March 2000 Water Industry Baseline Handbook, 2nd Edition.
4. Because several different analytical methods were used, MRLs were not uniform. The modal value is the most common MRL.
5. National extrapolations are generated by multiplying the system/population percentages and the national Baseline Handbook system/population numbers.

Abbreviations:

PWS = Public Water Systems; GW = Ground Water; SW = Surface Water; N/A = Not Applicable; Total Number of Samples = total number of samples on record for the contaminant; 99th Percentile Concentration = the concentration in the 99th percentile sample (out of either all samples or just samples with detections); Median Concentration of Detections = the concentration in the median sample (out of samples with detections); Total Number of PWSs = the total number of PWSs for which sampling results are available; Total Population Served = the total population served by PWSs for which sampling results are available; PWSs with Detections, PWSs >½HRL, or PWSs >HRL = PWSs with at least one sampling result greater than or equal to the MRL, exceeding the ½HRL benchmark, or exceeding the HRL benchmark, respectively; Population Served by PWSs with Detections, by PWSs >½HRL, or by PWSs >HRL = population served by PWSs with at least one sampling result greater than or equal to the MRL, exceeding the ½HRL benchmark, or exceeding the HRL benchmark, respectively.

Notes:

- Only results at or above the MRL were reported as detections. Concentrations below the MRL are considered non-detects.
- Because some systems were counted as both ground water and surface water systems and others could not be classified, GW and SW figures might not add up to totals.
- Due to differences between the ratios of GW and SW systems with monitoring results and the national ratio, extrapolated GW and SW figures might not add up to extrapolated totals.
- The HRL used in this analysis is a draft value for working review only.

Table E.3.a. 1,3-Dichloropropene Occurrence Summary Statistics (Round 1)

Frequency Factors	**24 State Cross-Section[1]**		**All Reporting States[2]**		**National System & Population Numbers[3]**	
Total Number of Samples	31,104		31,973		--	
Percent of Samples with Detections	0.06%		0.09%		--	
99th Percentile Concentration (all samples)	< MRL		< MRL		--	
Health Reference Level (HRL)	0.4 µg/L		0.4 µg/L		--	
Minimum Reporting Level (MRL) - Range - (modal value)[4]	0.02 - 10 µg/L (0.5 µg/L)		0.02 - 10 µg/L (0.5 µg/L)		--	
Maximum Concentration of Detections	2.0 µg/L		17.0 µg/L		--	
99th Percentile Concentration of Detections	2.0 µg/L		15.6 µg/L		--	
Median Concentration of Detections	1.0 µg/L		1.0 µg/L		--	
Total Number of PWSs Number of GW PWSs Number of SW PWSs	9,164 8,303 898		9,307 8,401 947		65,030 59,440 5,590	
Total Population Population of GW PWSs Population of SW PWSs	50,917,006 24,660,968 29,271,833		52,879,061 26,106,876 29,867,090		213,008,182 85,681,696 127,326,486	
Occurrence by System	**Number**	**Percentage**	**Number**	**Percentage**	**National Extrapolation[5]**	
					Cross-Section	**All States**
PWSs with detections (≥ MRL)	15	0.16%	19	0.20%	106	133
Range across States	0 - 7	0 - 1.75%	0 - 7	0 - 100%	N/A	N/A
GW PWSs with detections	10	0.12%	14	0.17%	72	99
SW PWSs with detections	5	0.56%	6	0.63%	31	35
PWSs > ½ HRL	15	0.16%	18	0.19%	106	126
Range across States	0 - 7	0 - 1.75%	0 - 7	0 - 100%	N/A	N/A
GW PWSs > ½ HRL	10	0.12%	13	0.15%	72	92
SW PWSs > ½ HRL	5	0.56%	6	0.63%	31	35
PWSs > HRL	15	0.16%	18	0.19%	106	126
Range across States	0 - 7	0 - 1.75%	0 - 7	0 - 100%	N/A	N/A
GW PWSs > HRL	10	0.12%	13	0.15%	72	92
SW PWSs > HRL	5	0.56%	6	0.63%	31	35
Occurrence by Population Served						
Population served by PWSs with detections	436,223	0.86%	500,486	0.95%	1,825,000	2,016,000
Range across States	0 - 225,630	0 - 6.12%	0 - 225,630	0 - 100%	N/A	N/A
Pop. Served by GW PWSs with detections	146,155	0.59%	210,418	0.81%	508,000	691,000
Pop. Served by SW PWSs with detections	290,068	0.99%	342,118	1.15%	1,262,000	1,458,000
Population served by PWSs > ½ HRL	436,223	0.86%	497,246	0.94%	1,825,000	2,003,000
Range across States	0 - 225,630	0 - 6.12%	0 - 225,630	0 - 100%	N/A	N/A
Pop. Served by GW PWSs > ½ HRL	146,155	0.59%	207,178	0.79%	508,000	680,000
Pop. Served by SW PWSs > ½ HRL	290,068	0.99%	342,118	1.15%	1,262,000	1,458,000
Population served by PWSs > HRL	436,223	0.86%	497,246	0.94%	1,825,000	2,003,000
Range across States	0 - 225,630	0 - 6.12%	0 - 225,630	0 - 100%	N/A	N/A
Pop. Served by GW PWSs > HRL	146,155	0.59%	207,178	0.79%	508,000	680,000
Pop. Served by SW PWSs > HRL	290,068	0.99%	342,118	1.15%	1,262,000	1,458,000

1. Summary Results based on 24-State Cross-Section, UCM Round 1 data.
2. Summary Results based on All Reporting States, UCM Round 1 data.
3. Total PWS and population numbers are from EPA March 2000 Water Industry Baseline Handbook, 2nd Edition.
4. Because several different analytical methods were used, MRLs were not uniform. The modal value is the most common MRL.
5. National extrapolations are generated by multiplying the system/population percentages and the national Baseline Handbook system/population numbers.

Abbreviations:

PWS = Public Water Systems; GW = Ground Water; SW = Surface Water; N/A = Not Applicable; Total Number of Samples = total number of samples on record for the contaminant; 99th Percentile Concentration = the concentration in the 99th percentile sample (out of either all samples or just samples with detections); Median Concentration of Detections = the concentration in the median sample (out of samples with detections); Total Number of PWSs = the total number of PWSs for which sampling results are available; Total Population Served = the total population served by PWSs for which sampling results are available; PWSs with Detections, PWSs >½HRL, or PWSs >HRL = PWSs with at least one sampling result greater than or equal to the MRL, exceeding the ½HRL benchmark, or exceeding the HRL benchmark, respectively; Population Served by PWSs with Detections, by PWSs >½HRL, or by PWSs >HRL = population served by PWSs with at least one sampling result greater than or equal to the MRL, exceeding the ½HRL benchmark, or exceeding the HRL benchmark, respectively.

Notes:

- Only results at or above the MRL were reported as detections. Concentrations below the MRL are considered non-detects.
- Because some systems were counted as both ground water and surface water systems and others could not be classified, GW and SW figures might not add up to totals.
- Due to differences between the ratios of GW and SW systems with monitoring results and the national ratio, extrapolated GW and SW figures might not add up to extrapolated totals.
- Due to MRL variability, it is likely that the sampling failed to capture some ½ HRL and HRL exceedances at participating systems, and the ½ HRL and HRL analyses underestimate actual contaminant occurrence.
- The HRL used in this analysis is a draft value for working review only.

Table E.3.b. 1,3-Dichloropropene Occurrence Summary Statistics (Round 2)

Frequency Factors	**20 State Cross-Section[1]**		**All Reporting States[2]**		**National System & Population Numbers[3]**	
Total Number of Samples	70,631		79,388		--	
Percent of Samples with Detections	0.11%		0.10%		--	
99th Percentile Concentration (all samples)	< MRL		< MRL		--	
Health Reference Level (HRL)	0.4 µg/L		0.4 µg/L		--	
Minimum Reporting Level (MRL) - Range - (modal value)[4]	0.08 - 1 µg/L (0.5 µg/L)		0.08 - 1 µg/L (0.5 µg/L)		--	
Maximum Concentration of Detections	39 µg/L		39 µg/L		--	
99th Percentile Concentration of Detections	39 µg/L		25 µg/L		--	
Median Concentration of Detections	0.5 µg/L		0.5 µg/L		--	
Total Number of PWSs	16,787		18,944		65,030	
Number of GW PWSs	15,178		17,098		59,440	
Number of SW PWSs	1,609		1,846		5,590	
Total Population	45,951,052		55,713,623		213,008,182	
Population of GW PWSs	17,423,030		21,446,615		85,681,696	
Population of SW PWSs	28,528,022		34,267,008		127,326,486	
Occurrence by System	**Number**	**Percentage**	**Number**	**Percentage**	**National Extrapolation[5]**	
					Cross-Section	**All States**
PWSs with detections (≥ MRL)	58	0.35%	59	0.31%	225	203
Range across States	0 - 43	0 - 2.91%	0 - 43	0 - 2.91%	N/A	N/A
GW PWSs with detections	48	0.32%	48	0.28%	188	167
SW PWSs with detections	10	0.62%	11	0.60%	35	33
PWSs > ½ HRL	50	0.30%	51	0.27%	194	175
Range across States	0 - 35	0 - 2.36%	0 - 35	0 - 2.36%	N/A	N/A
GW PWSs > ½ HRL	41	0.27%	41	0.24%	161	143
SW PWSs > ½ HRL	9	0.56%	10	0.54%	31	30
PWSs > HRL	38	0.23%	38	0.20%	147	130
Range across States	0 - 23	0 - 1.55%	0 - 23	0 - 1.55%	N/A	N/A
GW PWSs > HRL	29	0.19%	29	0.17%	114	101
SW PWSs > HRL	9	0.56%	9	0.49%	31	27
Occurrence by Population Served						
Population served by PWSs with detections	252,643	0.55%	260,157	0.47%	1,171,000	995,000
Range across States	0 - 209,261	0 - 5.78%	0 - 209,261	0 - 5.78%	N/A	N/A
Pop. Served by GW PWSs with detections	197,066	1.13%	197,066	0.92%	969,000	787,000
Pop. Served by SW PWSs with detections	55,577	0.19%	63,091	0.18%	248,000	234,000
Population served by PWSs > ½ HRL	192,870	0.42%	200,384	0.36%	894,000	766,000
Range across States	0 - 149,488	0 - 4.13%	0 - 149,488	0 - 4.13%	N/A	N/A
Pop. Served by GW PWSs > ½ HRL	141,275	0.81%	141,275	0.66%	695,000	564,000
Pop. Served by SW PWSs > ½ HRL	51,595	0.18%	59,109	0.17%	230,000	220,000
Population served by PWSs > HRL	151,553	0.33%	151,553	0.27%	703,000	579,000
Range across States	0 - 108,171	0 - 2.99%	0 - 108,171	0 - 2.99%	N/A	N/A
Pop. Served by GW PWSs > HRL	99,958	0.57%	99,958	0.47%	492,000	399,000
Pop. Served by SW PWSs > HRL	51,595	0.18%	51,595	0.15%	230,000	192,000

1. Summary Results based on 20-State Cross-Section, UCM Round 2 data.

2. Summary Results based on All Reporting States, UCM Round 2 data.

3. Total PWS and population numbers are from EPA March 2000 Water Industry Baseline Handbook, 2nd Edition.

4. Because several different analytical methods were used, MRLs were not uniform. The modal value is the most common MRL.

5. National extrapolations are generated by multiplying the system/population percentages and the national Baseline Handbook system/population numbers.

Abbreviations:

PWS = Public Water Systems; GW = Ground Water; SW = Surface Water; N/A = Not Applicable; Total Number of Samples = total number of samples on record for the contaminant; 99th Percentile Concentration = the concentration in the 99th percentile sample (out of either all samples or just samples with detections); Median Concentration of Detections = the concentration in the median sample (out of samples with detections); Total Number of PWSs = the total number of PWSs for which sampling results are available; Total Population Served = the total population served by PWSs for which sampling results are available; PWSs with Detections, PWSs >½HRL, or PWSs >HRL = PWSs with at least one sampling result greater than or equal to the MRL, exceeding the ½HRL benchmark, or exceeding the HRL benchmark, respectively; Population Served by PWSs with Detections, by PWSs >½HRL, or by PWSs >HRL = population served by PWSs with at least one sampling result greater than or equal to the MRL, exceeding the ½HRL benchmark, or exceeding the HRL benchmark, respectively.

Notes:

- Only results at or above the MRL were reported as detections. Concentrations below the MRL are considered non-detects.
- Due to differences between the ratios of GW and SW systems with monitoring results and the national ratio, extrapolated GW and SW figures might not add up to extrapolated totals.
- Due to MRL variability, it is likely that the sampling failed to capture some ½ HRL and HRL exceedances at participating systems, and the ½ HRL and HRL analyses underestimate actual contaminant occurrence.
- The HRL used in this analysis is a draft value for working review only.

Table E.4.a. 1,1,2,2-Tetrachloroethane Occurrence Summary Statistics (Round 1)

Frequency Factors	**24 State Cross-Section[1]**		**All Reporting States[2]**		**National System & Population Numbers[3]**	
Total Number of Samples	67,688		70,784		--	
Percent of Samples with Detections	0.16%		0.16%		--	
99th Percentile Concentration (all samples)	< MRL		< MRL		--	
Health Reference Level (HRL)	0.4 µg/L		0.4 µg/L		--	
Minimum Reporting Level (MRL) - Range - (modal value)[4]	0.01 - 10 µg/L (0.5 µg/L)		0.01 - 10 µg/L (0.5 µg/L)		--	
Maximum Concentration of Detections	200 µg/L		200 µg/L		--	
99th Percentile Concentration of Detections	112 µg/L		112 µg/L		--	
Median Concentration of Detections	0.5 µg/L		0.5 µg/L		--	
Total Number of PWSs	20,407		20,899		65,030	
Number of GW PWSs	18,693		19,054		59,440	
Number of SW PWSs	1,867		2,019		5,590	
Total Population	94,710,065		98,334,686		213,008,182	
Population of GW PWSs	55,763,644		57,663,608		85,681,696	
Population of SW PWSs	43,763,942		45,776,159		127,326,486	
Occurrence by System	**Number**	**Percentage**	**Number**	**Percentage**	**National Extrapolation[5]**	
					Cross-Section	**All States**
PWSs with detections (≥ MRL)	91	0.45%	101	0.48%	290	314
Range across States	0 - 39	0 - 11.64%	0 - 39	0 - 100%	N/A	N/A
GW PWSs with detections	72	0.39%	80	0.42%	229	250
SW PWSs with detections	19	1.02%	21	1.04%	57	58
PWSs > ½ HRL	44	0.22%	54	0.26%	140	168
Range across States	0 - 11	0 - 2.76%	0 - 11	0 - 100%	N/A	N/A
GW PWSs > ½ HRL	33	0.18%	41	0.22%	105	128
SW PWSs > ½ HRL	11	0.59%	13	0.64%	33	36
PWSs > HRL	41	0.20%	50	0.24%	131	156
Range across States	0 - 11	0 - 2.76%	0 - 11	0 - 100%	N/A	N/A
GW PWSs > HRL	32	0.17%	39	0.20%	102	122
SW PWSs > HRL	9	0.48%	11	0.54%	27	30
Occurrence by Population Served						
Population served by PWSs with detections	1,762,198	1.86%	2,119,844	2.16%	3,963,000	4,592,000
Range across States	0 - 616,019	0 - 25.48%	0 - 616,019	0 - 100%	N/A	N/A
Pop. Served by GW PWSs with detections	1,017,630	1.82%	1,365,976	2.37%	1,564,000	2,030,000
Pop. Served by SW PWSs with detections	744,568	1.70%	753,868	1.65%	2,166,000	2,097,000
Population served by PWSs > ½ HRL	1,597,140	1.69%	1,954,786	1.99%	3,592,000	4,234,000
Range across States	0 - 616,019	0 - 25.48%	0 - 616,019	0 - 100%	N/A	N/A
Pop. Served by GW PWSs > ½ HRL	864,770	1.55%	1,213,116	2.10%	1,329,000	1,803,000
Pop. Served by SW PWSs > ½ HRL	732,370	1.67%	741,670	1.62%	2,131,000	2,063,000
Population served by PWSs > HRL	1,543,647	1.63%	1,868,493	1.90%	3,472,000	4,047,000
Range across States	0 - 616,019	0 - 25.48%	0 - 616,019	0 - 100%	N/A	N/A
Pop. Served by GW PWSs > HRL	851,641	1.53%	1,167,187	2.02%	1,309,000	1,734,000
Pop. Served by SW PWSs > HRL	692,006	1.58%	701,306	1.53%	2,013,000	1,951,000

1. Summary Results based on 24-State Cross-Section, UCM Round 1 data.
2. Summary Results based on All Reporting States, UCM Round 1 data.
3. Total PWS and population numbers are from EPA March 2000 Water Industry Baseline Handbook, 2nd Edition.
4. Because several different analytical methods were used, MRLs were not uniform. The modal value is the most common MRL.
5. National extrapolations are generated by multiplying the system/population percentages and the national Baseline Handbook system/population numbers.

Abbreviations:

PWS = Public Water Systems; GW = Ground Water; SW = Surface Water; N/A = Not Applicable; Total Number of Samples = total number of samples on record for the contaminant; 99th Percentile Concentration = the concentration in the 99th percentile sample (out of either all samples or just samples with detections); Median Concentration of Detections = the concentration in the median sample (out of samples with detections); Total Number of PWSs = the total number of PWSs for which sampling results are available; Total Population Served = the total population served by PWSs for which sampling results are available; PWSs with Detections, PWSs >½HRL, or PWSs >HRL = PWSs with at least one sampling result greater than or equal to the MRL, exceeding the ½HRL benchmark, or exceeding the HRL benchmark, respectively; Population Served by PWSs with Detections, by PWSs >½HRL, or by PWSs >HRL = population served by PWSs with at least one sampling result greater than or equal to the MRL, exceeding the ½HRL benchmark, or exceeding the HRL benchmark, respectively.

Notes:

- Only results at or above the MRL were reported as detections. Concentrations below the MRL are considered non-detects.
- Because some systems were counted as both ground water and surface water systems and others could not be classified, GW and SW figures might not add up to totals.
- Due to differences between the ratios of GW and SW systems with monitoring results and the national ratio, extrapolated GW and SW figures might not add up to extrapolated totals.
- Due to MRL variability, it is likely that the sampling failed to capture some ½ HRL and HRL exceedances at participating systems, and the ½ HRL and HRL analyses underestimate actual contaminant occurrence.
- The HRL used in this analysis is a draft value for working review only.

Table E.4.b. 1,1,2,2-Tetrachloroethane Occurrence Summary Statistics (Round 2)

Frequency Factors	**20 State Cross-Section[1]**		**All Reporting States[2]**		**National System & Population Numbers[3]**	
Total Number of Samples	98,911		112,480		--	
Percent of Samples with Detections	0.02%		0.03%		--	
99th Percentile Concentration (all samples)	< MRL		< MRL		--	
Health Reference Level (HRL)	0.4 µg/L		0.4 µg/L		--	
Minimum Reporting Level (MRL) - Range - (modal value)[4]	0.1 - 2.5 µg/L (0.5 µg/L)		0.1 - 2.5 µg/L (0.5 µg/L)		--	
Maximum Concentration of Detections	2 µg/L		3.9 µg/L		--	
99th Percentile Concentration of Detections	2 µg/L		3.9 µg/L		--	
Median Concentration of Detections	0.5 µg/L		0.5 µg/L		--	
Total Number of PWSs Number of GW PWSs Number of SW PWSs	24,800 22,106 2,694		28,209 25,152 3,057		65,030 59,440 5,590	
Total Population Population of GW PWSs Population of SW PWSs	71,294,263 25,978,359 45,315,904		84,692,367 31,069,576 53,622,791		213,008,182 85,681,696 127,326,486	
Occurrence by System	**Number**	**Percentage**	**Number**	**Percentage**	**National Extrapolation[5]**	
					Cross-Section	**All States**
PWSs with detections (≥ MRL) Range across States GW PWSs with detections SW PWSs with detections	19 0 - 9 11 8	0.08% 0 - 0.5% 0.05% 0.30%	22 0 - 9 13 9	0.08% 0 - 3.49% 0.05% 0.29%	50 N/A 30 17	51 N/A 31 16
PWSs > ½ HRL Range across States GW PWSs > ½ HRL SW PWSs > ½ HRL	18 0 - 9 11 7	0.07% 0 - 0.50% 0.05% 0.26%	19 0 - 9 12 7	0.07% 0 - 1.16% 0.05% 0.23%	47 N/A 30 15	44 N/A 28 13
PWSs > HRL Range across States GW PWSs > HRL SW PWSs > HRL	17 0 - 9 11 6	0.07% 0 - 0.50% 0.05% 0.22%	18 0 - 9 12 6	0.06% 0 - 1.16% 0.05% 0.20%	45 N/A 30 12	41 N/A 28 11
Occurrence by Population Served						
Population served by PWSs with detections Range across States Pop. Served by GW PWSs with detections Pop. Served by SW PWSs with detections	1,862,105 0 - 1,500,000 24,115 1,837,990	2.61% 0 - 29.92% 0.09% 4.06%	1,892,850 0 - 1,500,000 51,543 1,841,307	2.23% 0 - 29.92% 0.17% 3.43%	5,563,000 N/A 80,000 5,164,000	4,761,000 N/A 142,000 4,372,000
Population served by PWSs > ½ HRL Range across States Pop. Served by GW PWSs > ½ HRL Pop. Served by SW PWSs > ½ HRL	362,105 0 - 306,000 24,115 337,990	0.51% 0 - 7.12% 0.09% 0.75%	371,980 0 - 306,000 33,990 337,990	0.44% 0 - 7.12% 0.11% 0.63%	1,082,000 N/A 80,000 950,000	936,000 N/A 94,000 803,000
Population served by PWSs > HRL Range across States Pop. Served by GW PWSs > HRL Pop. Served by SW PWSs > HRL	56,105 0 - 26,550 24,115 31,990	0.08% 0 - 0.54% 0.09% 0.07%	65,980 0 - 26,550 33,990 31,990	0.08% 0 - 0.54% 0.11% 0.06%	168,000 N/A 80,000 90,000	166,000 N/A 94,000 76,000

1. Summary Results based on 20-State Cross-Section, UCM Round 2 data.
2. Summary Results based on All Reporting States, UCM Round 2 data.
3. Total PWS and population numbers are from EPA March 2000 Water Industry Baseline Handbook, 2nd Edition.
4. Because several different analytical methods were used, MRLs were not uniform. The modal value is the most common MRL.
5. National extrapolations are generated by multiplying the system/population percentages and the national Baseline Handbook system/population numbers.

Abbreviations:

PWS = Public Water Systems; GW = Ground Water; SW = Surface Water; N/A = Not Applicable; Total Number of Samples = total number of samples on record for the contaminant; 99th Percentile Concentration = the concentration in the 99th percentile sample (out of either all samples or just samples with detections); Median Concentration of Detections = the concentration in the median sample (out of samples with detections); Total Number of PWSs = the total number of PWSs for which sampling results are available; Total Population Served = the total population served by PWSs for which sampling results are available; PWSs with Detections, PWSs >½HRL, or PWSs >HRL = PWSs with at least one sampling result greater than or equal to the MRL, exceeding the ½HRL benchmark, or exceeding the HRL benchmark, respectively; Population Served by PWSs with Detections, by PWSs >½HRL, or by PWSs >HRL = population served by PWSs with at least one sampling result greater than or equal to the MRL, exceeding the ½HRL benchmark, or exceeding the HRL benchmark, respectively.

Notes:

- Only results at or above the MRL were reported as detections. Concentrations below the MRL are considered non-detects.
- Due to differences between the ratios of GW and SW systems with monitoring results and the national ratio, extrapolated GW and SW figures might not add up to extrapolated totals.
- Due to MRL variability, it is likely that the sampling failed to capture some ½ HRL and HRL exceedances at participating systems, and the ½ HRL and HRL analyses underestimate actual contaminant occurrence.
- The HRL used in this analysis is a draft value for working review only.