INTRODUCTION .................................................................................................................. 1
1.1. Purpose Of This Document.................................................................................. 1
1.2. Nature Of Contaminants And Other Regulated Compounds ....................... 2
1.3. Requirements ..........................................................................................................

MICROBIOLOGICAL REQUIREMENTS .......................................................... 5
2.1. Total Coliform Rule............................................................................................... 5
2.2. Source Sampling under Ground Water Rule...................................................... 9
2.3. Disinfection............................................................................................................ 11

CHEMICAL REQUIREMENTS ........................................................................... 14
3.1. Nitrate/Nitrite Monitoring Requirements .......................................................... 14
3.2. Inorganic, Volatile Organic, and Synthetic Organic Compounds ................. 15
3.3. Radiological Contaminants.................................................................................. 18
3.4. Lead and Copper ................................................................................................ 20
3.5. Secondary Drinking Water Standards ............................................................... 27

DISINFECTANTS AND DISINFECTION BYPRODUCTS .................................. 28
4.1. Disinfectants ........................................................................................................ 29
4.2. Disinfection By-Products (DBP)......................................................................... 30

FLUORIDE ADDITION .......................................................................................... 35

CONSECUTIVE PUBLIC WATER SYSTEMS ..................................................... 36

PUBLIC NOTIFICATION REQUIREMENTS .................................................. 37
7.1. What violations and situations require public notice? ..................................... 37
7.2. Notification Tiers ................................................................................................ 38
7.3. Timing and Delivery Methods for Public Notification .................................... 39
7.4. Presentation ......................................................................................................... 40
7.5. State Notification ............................................................................................... 40
7.6. Required Contents .............................................................................................. 40
8. CONSUMER CONFIDENCE REPORT .................................................. 43
   8.1. Delivery Requirements.................................................................43
   8.2. Report Contents...........................................................................44
   8.3. Deadlines.....................................................................................45
9. OTHER ................................................................................................. 46
   9.1. Recordkeeping..............................................................................46
   9.2. Sanitary Surveys...........................................................................46
   9.3. Operator Certification.................................................................47
   9.4. Water System Improvements.....................................................49
   9.5. Service Connection Fees............................................................49

APPENDIX A - TOTAL COLIFORM SAMPLE SITE PLAN GUIDELINES..50
APPENDIX B - HOW TO TAKE A BACTERIOLOGICAL SAMPLE ....... 51
APPENDIX C - MAXIMUM CONTAMINANT LEVELS AND HEALTH
   EFFECTS LANGUAGE.............................................................................52
APPENDIX D - CHEMICAL MONITORING WAIVERS .........................60
APPENDIX E – LEAD AND COPPER.....................................................62
Tables

TABLE 1.1  SUMMARY OF DRINKING WATER REGULATIONS ..........................................................4
TABLE 2.1  ROUTINE TCR SAMPLES ..............................................................................................6
TABLE 2.2  REPEAT SAMPLES .......................................................................................................7
TABLE 3.1  REDUCED MONITORING OPTIONS FOR ALPHA PARTICLE ACTIVITY, RADIUM-226, RADIUM-228, AND URANIUM .................................................................................................................................19
TABLE 3.2  REDUCED MONITORING OPTIONS FOR GROSS ALPHA PARTICLE ACTIVITY ........................................................................................................................................................................20
TABLE 3.3  TIERING CLASSIFICATION............................................................................................21
TABLE 3.4  LEAD AND COPPER TAP MONITORING.....................................................................22
TABLE 3.5  CRITERIA FOR REDUCED LEAD AND COPPER TAP MONITORING..........................22
TABLE 3.6  LEAD AND COPPER ACTION LEVELS (MG/L) ............................................................23
TABLE 3.7  WATER QUALITY PARAMETERS ..................................................................................25
TABLE 3.8  NUMBER OF WQP TAP SAMPLE SITES ......................................................................25
TABLE 3.9  SECONDARY MAXIMUM CONTAMINANT LEVELS ......................................................27
TABLE 4.1  STAGE 2 DBPR COMPLIANCE DATES .........................................................................29
TABLE 4.2  ROUTINE MONITORING REQUIREMENTS FOR TTHM AND HAA5 UNDER STAGE 1 DBPR ..................................................................................................................................................................................31
TABLE 4.3  ROUTINE MONITORING REQUIREMENTS FOR TTHM AND HAA5 UNDER STAGE 2 DBPR ..................................................................................................................................................................................32
TABLE 4.4  TTHM AND HAA5 REDUCED MONITORING UNDER STAGE 2 DBPR ....................33
TABLE 7.1  TIMING AND DELIVERY METHODS FOR PUBLIC NOTIFICATION ..........................39
TABLE 8.1  CONTENTS OF THE REPORT .........................................................................................44
TABLE 8.1  CONTENTS OF THE REPORT (CONTINUED) .................................................................45
TABLE 8.2  REPORT DEADLINES ....................................................................................................45
TABLE 9.1  RECORDKEEPING FOR PUBLIC WATER SYSTEMS ..................................................46
TABLE 9.2  CERTIFICATION CLASSES ............................................................................................47
<table>
<thead>
<tr>
<th>Acronyms</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>AL</td>
<td>Action Level</td>
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<tr>
<td>ARM</td>
<td>Administrative Rules of Montana</td>
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<tr>
<td>BAT</td>
<td>Best Available Technology</td>
</tr>
<tr>
<td>CCR</td>
<td>Consumer Confidence Report</td>
</tr>
<tr>
<td>CCT</td>
<td>Corrosion Control Treatment</td>
</tr>
<tr>
<td>CEC</td>
<td>Continuing Education Credit</td>
</tr>
<tr>
<td>CT</td>
<td>Concentration x Time</td>
</tr>
<tr>
<td>C</td>
<td>Community (Public Water Supply)</td>
</tr>
<tr>
<td>DPD</td>
<td>N, N-diethyl-p-phenetnediamine</td>
</tr>
<tr>
<td>DBP</td>
<td>Disinfection Byproduct</td>
</tr>
<tr>
<td>DBPR</td>
<td>Disinfectants and Disinfection Byproduct Rule</td>
</tr>
<tr>
<td>DEQ</td>
<td>Department of Environmental Quality</td>
</tr>
<tr>
<td>EPA</td>
<td>Environmental Protection Agency</td>
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<tr>
<td>GWUDISW</td>
<td>Ground Water Under the Direct Influence of Surface Water</td>
</tr>
<tr>
<td>GWR</td>
<td>Ground Water Rule</td>
</tr>
<tr>
<td>HAA5</td>
<td>Five Haloacetic Acids</td>
</tr>
<tr>
<td>IDSE</td>
<td>Initial Distribution System Evaluation</td>
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<td>IOC</td>
<td>Inorganic Chemical</td>
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<td>LCR</td>
<td>Lead and Copper Rule</td>
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<td>Lead and Copper Rule Short Term Revisions</td>
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<td>LSLR</td>
<td>Lead Service Line Replacement</td>
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<tr>
<td>LT2ESWTR</td>
<td>Long Term 2 Enhanced Surface Water Treatment Rule</td>
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<td>MCL</td>
<td>Maximum Contaminant Level</td>
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<tr>
<td>MCLG</td>
<td>Method Detection Limit</td>
</tr>
<tr>
<td>MFL</td>
<td>Million Fibers per Liter</td>
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<tr>
<td>Mg/L</td>
<td>Milligrams per Liter</td>
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<tr>
<td>MRDL</td>
<td>Maximum Disinfectant Residual Levels</td>
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<td>MRDLG</td>
<td>Maximum Disinfectant Residual Levels Goal</td>
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<tr>
<td>MREM/YR</td>
<td>Millirems per Year</td>
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<td>NTNC</td>
<td>Non-Transient Non-Community (Public Water Supply)</td>
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<tr>
<td>NTU</td>
<td>Nephelometric Turbidity Unit</td>
</tr>
<tr>
<td>OCCT</td>
<td>Optimal Corrosion Control Treatment</td>
</tr>
<tr>
<td>OEL</td>
<td>Operational Evaluation Level</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Description</td>
</tr>
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<tr>
<td>OWQP</td>
<td>Optimal Water Quality Parameter</td>
</tr>
<tr>
<td>PCBs</td>
<td>Polychlorinated Biphenyls</td>
</tr>
<tr>
<td>pCi/L</td>
<td>Picocuries per Liter</td>
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<td>PWS</td>
<td>Public Water Supply</td>
</tr>
<tr>
<td>PPM</td>
<td>Parts per Million</td>
</tr>
<tr>
<td>PPB</td>
<td>Parts per Billion</td>
</tr>
<tr>
<td>PPT</td>
<td>Parts per Trillion</td>
</tr>
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<td>PPQ</td>
<td>Parts per Quadrillion</td>
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<td>SMCL</td>
<td>Secondary Maximum Contaminant Level</td>
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<td>Synthetic Organic Chemicals</td>
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<td>Short Term Revisions (see LCR STR)</td>
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<td>SWTR</td>
<td>Surface Water Treatment Rule</td>
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<td>Total Coliform Rule</td>
</tr>
<tr>
<td>TOC</td>
<td>Total Organic Carbon</td>
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<tr>
<td>TT</td>
<td>Treatment Technique</td>
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<tr>
<td>TTHM</td>
<td>Total Trihalomethane</td>
</tr>
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<td>TNC</td>
<td>Transient Non-Community (Public Water Supply)</td>
</tr>
<tr>
<td>VOC</td>
<td>Volatile Organic Chemical</td>
</tr>
<tr>
<td>WQP</td>
<td>Water Quality Parameters</td>
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1. INTRODUCTION

1.1 Purpose Of This Document

This document is designed to provide a general summary of the Montana Department of Environmental Quality (DEQ) Drinking Water Regulations for Community and Non-transient Noncommunity Public Water Supplies. Any system that utilizes a surface water source or a ground water source under the direct influence of surface water, must comply with requirements associated with the treatment and monitoring of surface water systems summarized in the DEQ document Surface Water Regulations Summary.

This information is provided to assist with interpretation of the requirements, but may not cover the entire regulation. In any situation in which there is a contradiction between this document and the applicable Administrative Rule of Montana (ARM), the ARM is controlling. For a complete copy of the DEQ (Montana Department of Environmental Quality) Drinking Water Regulations please visit http://www.deq.mt.gov/dir/legal/title17.mcpx or call (406) 444-4400.

1.1.1 Definitions Of Public Water Supplies

"Public water supply system (PWS)" means a system for the provision of water for human consumption from any community well, water hauler for cisterns, water bottling plants, water dispenser, or other water supply that has at least 15 service connections or that regularly serves at least 25 persons daily for any 60 or more days in a calendar year.

There are three types of public water supplies:

"Community"(C) means a public water supply system which serves at least 15 service connections used by year-round residents or that regularly serves at least 25 year-round residents. Examples include cities, towns, nursing homes and prisons.

"Non-transient non-community"(NTNC) means a public water supply system that is not a community water system and that regularly serves at least 25 of the same persons over six months per year. Examples include workplaces and schools.

"Transient non-community" (TNC) means a public water supply system that is not a community water system and that does not regularly serve at least 25 of the same persons for at least 6 months a year. Examples include restaurants, cafes, bars, campgrounds and motels.

1.2 Nature Of Contaminants And Other Regulated Compounds

Community systems serve a year-round population and non-transient non-community water systems regularly serve the same individuals over six months of the year; therefore regular monitoring must be conducted for all contaminants that can have an adverse impact on human health.

1.2.1 Types of contaminants and compounds

Montana regulations require all community and non-transient non-community public water supplies to monitor for microbiological, chemical and radiological quality.

*Microbial* – include disease-causing organisms such as *Giardia, Cryptosporidium*, viruses, and pathogenic bacteria. Because these organisms are difficult to test for, regulations often provide for testing of indicators of microbial contamination such as turbidity and coliform bacteria.

*Total coliform bacteria* are bacteria that are naturally present in the environment and are used as an indicator that other, potentially-harmful organisms may be present.
**Fecal coliforms** are bacteria commonly found in the intestines of warm-blooded animals and humans. Their presence indicates the water may be contaminated with human or animal wastes.

**Fecal indicators** are microbes whose presence indicates the water may be contaminated with human or animal wastes. Under the Ground Water Rule, acceptable fecal indicators are *E. coli*, *Enterococci* and coliphage.

*E. coli* are bacteria commonly found in the intestines of warm-blooded animals and humans whose presence in water is evidence of sewerage or animal waste contamination. Most *E. coli* are harmless, but some can cause serious illness. *E. coli* are both a fecal coliform and a fecal indicator.

**Chemical** – include organic and inorganic contaminants that may be found in the source or may enter soils and groundwater through unregulated releases, as well as compounds that may be added to the water such as disinfectants or fluoride; or that may be introduced to water in the distribution system due to the chemical nature of the water such as lead, copper, and disinfection by-products.

**Radiological** – includes uranium, radium 226, radium 228, gross alpha, beta particles and photon emitters.

1.2.2 **Health effects of contaminants and compounds**

**Acute health effects**

Acute health effects are characterized by sudden and severe onset of illness after exposure and rapid absorption of a substance. They have significant potential to have serious adverse effects on human health as a result of short-term exposure. Normally a single exposure may be enough to cause disease. Acute health effects are often reversible.

All microbial pathogens and a few chemical compounds including nitrate, nitrite, and chlorine dioxide fall into this category.

**Chronic health effects**

Chronic health effects are caused by prolonged or repeated exposures over many days, months or years. They have significant potential to have serious adverse effects on human health. Symptoms may not be immediately apparent. Chronic health effects are often irreversible. Most chemical and radiological compounds fall into this category.

A comprehensive list of all the contaminants, Maximum Contaminant Levels, Maximum Residual Disinfectant Levels, and health effects are included in Appendix C.

1.3 **Requirements**

Your water system has been classified as a Community Water System (C) or Non-transient Non-Community (NTNC) public water supply system. As owner, manager, or operator of a community system, you have important responsibilities outlined in Montana law and rules associated with the protection of public health. The term “system” as used throughout this document refers to the owner, manager or operator as applicable.

This document will provide a summary of the requirements associated with owning and maintaining a community or non-transient water system. They include:

**Monitoring water quality**

Systems are required to monitor the microbial, chemical and radiological quality of the water they produce on a periodic basis. Monitoring frequency is based on the chemical or contaminant. Some chemicals are monitored continuously; others are monitored daily, monthly, annually, triennially, and for some situations sampling is conducted every 9 years. The location of sampling depends on the nature and source of the contaminant or
compound. Some monitoring is conducted at the “entry point” (a point after treatment, but prior to deliver to the public) and others are taken within the distribution system itself.

**Keeping the public informed**

Water systems are required to keep the public informed about the quality of the water that they are providing. Notice of most violations as well as other situations that can have an impact on public health are required in the form of public notification. In addition, community systems are required to provide an annual water quality report to their customers in the form of a consumer confidence report.

**Maintaining records and reporting data to DEQ**

Water quality sample results as well as other reports and notices must be submitted to DEQ. Most laboratories submit results directly to DEQ; however the system is ultimately responsible to make sure the sample results are received by DEQ. The reporting requirements associated with each regulation and contaminant are discussed at the end of each section.

Systems are also required to maintain records of microbial, chemical, and radiological sampling, as well as other notifications, reports and statements. Records must be kept anywhere from 3 to 12 years, depending on the document, see Section 9.1 for further details.

**Operator certification**

Operators of community and non-transient non-community public water systems are required to obtain a level of certification appropriate for the type and size of system and type of water treatment that the system employs. Certified operators are required to pay an annual renewal fee to maintain their active status. A fully certified operator must earn continuing education credits during each two year training period that commences on June 1 of each even-numbered year in order to maintain their certification.

**Obtaining approval for water system improvements**

Prior to installation, modification, alteration or extension of a public water supply, a system must receive written approval from the DEQ Public Water Supply and Subdivisions Bureau, Plan Review Section.

**Paying service connection fees**

Water systems pay an annual fee to the Public Water Supply and Subdivisions Bureau to help fund technical assistance and required compliance inspections. Fees are based on system classification and number of connections.

Table 1.1 provides a summary of drinking water regulations and where information on those regulations may be found in this or other documents.
# Table 1.1 Summary of Drinking Water Regulations

<table>
<thead>
<tr>
<th>System Types</th>
<th>Microbial</th>
<th>Chemical/Radiological</th>
<th>Public Info</th>
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<tbody>
<tr>
<td></td>
<td>Total Coliform</td>
<td>Ground Water Source Sampling (Fecal Indicator)</td>
<td>Ground Water Treatment (Turbidity)</td>
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<tr>
<td><strong>System Types</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• C</td>
<td>All System Types</td>
<td>All System Types</td>
<td>All System Types</td>
</tr>
<tr>
<td>• NTNC</td>
<td>All System Types</td>
<td>All System Types</td>
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<thead>
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<td>• Ground</td>
<td>Surface</td>
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</tr>
<tr>
<td>• Purchase</td>
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<th>Sampling Location</th>
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<td>Distribution System</td>
<td>Distribution System</td>
<td>Entry Point</td>
<td>Distribution System</td>
</tr>
<tr>
<td>At Source</td>
<td>At Source</td>
<td>Entry Point</td>
<td>At Source</td>
</tr>
<tr>
<td>After individual and combined filter</td>
<td>After CT³ and in distribution</td>
<td>Entry Point</td>
<td>After CT³ and in distribution</td>
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<td>At or before 1st user and may require distribution</td>
<td>At or before 1st user and may require distribution</td>
<td>Entry Point</td>
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<table>
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<tr>
<td>Monthly¹</td>
<td>Monthly¹</td>
<td>Monthly¹</td>
<td>Monthly¹</td>
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<tr>
<td>When triggered or as directed</td>
<td>When triggered or as directed</td>
<td>When triggered or as directed</td>
<td>When triggered or as directed</td>
</tr>
<tr>
<td>See Requirements</td>
<td>See Requirements</td>
<td>See Requirements</td>
<td>See Requirements</td>
</tr>
<tr>
<td>At CT³ Continuous or Daily</td>
<td>Continuous or Daily⁴</td>
<td>Continuous or Daily⁴</td>
<td>Continuous or Daily⁴</td>
</tr>
<tr>
<td>Range from Quarterly to Annually⁴</td>
<td>Range from Quarterly to Every 9 years⁵</td>
<td>Range from Quarterly to Every 9 years⁵</td>
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<td>See Requirements</td>
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<td>Daily</td>
<td>Daily</td>
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<td>Daily</td>
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<td>24 hours, 30 days or 1 year (depending on tier)</td>
<td>24 hours, 30 days or 1 year (depending on tier)</td>
<td>24 hours, 30 days or 1 year (depending on tier)</td>
<td>24 hours, 30 days or 1 year (depending on tier)</td>
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<td>Section 2.2</td>
<td>Section 2.2</td>
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<tr>
<td>Surface Water Regulations Summary</td>
<td>Surface Water Regulations Summary</td>
<td>Surface Water Regulations Summary</td>
<td>Surface Water Regulations Summary</td>
</tr>
</tbody>
</table>

¹ Some small transient ground water systems may reduce to quarterly
² Some requirements for transient systems that use chlorine dioxide
³ CT = concentration x contact time
⁴ Frequency depends on contaminant level and system type
⁵ Depends upon type of system. Could be one of 3 different requirements.
2. MICROBIOLOGICAL REQUIREMENTS

System owners are responsible for selecting a state certified laboratory to perform the microbiological analysis and arrange for the laboratory to send sterilized containers to collect the samples. Most laboratories submit results directly to DEQ; however the system is ultimately responsible to make sure the bacteriological sample results are received by DEQ. It is recommended that the system verify with the certified laboratory that the laboratory will submit the results. The water system is responsible for the cost of all analyses collected by a certified person.

2.1 Total Coliform Rule

Regulations regarding testing for microbiological contaminants in the distribution system are addressed in the Total Coliform Rule (TCR). Coliform bacteria, while generally not considered the cause of disease themselves, are indicators that other disease-causing organisms may be present.

The Total Coliform Rule was finalized in June 1989. The state regulation can be found in ARM 17.38.207 and 17.38.215. The federal rule reference is 40 CFR 141.21 and 141.63.

2.1.1 Monitoring Location

TCR samples are taken in the distribution system, and must be collected at sites identified in the system’s sample site plan. The system must create and submit to DEQ a sample site plan to ensure the sites are representative of the entire distribution system. Some community systems and most non-transient noncommunity systems have a limited distribution system. Sampling plans for these systems will likely be very straightforward. Systems that are completely within one building with limited plumbing may have one or two sample sites. Sampling plans for larger systems will include multiple sites that incorporate the entire system. Refer to Appendix A for more information on how to create a sample site plan.

Sample sites must be rotated until all designated sites have been sampled before a site is used again. The bacteriological report form submitted to the laboratory with the samples must identify the sample sites where each sample was taken.

2.1.2 Sampling Methods

Coliform samples are susceptible to contamination if the sample is collected in a careless manner. Appendix B gives step by step instructions on how to properly collect a coliform sample to avoid false positive samples.

Transportation time

The transportation time must be no more than 30 hours from when the sample is collected until it is analyzed by the laboratory. Systems need to discuss sample collection dates with the laboratory to ensure the sample will be received in time to complete the analysis within the 30-hour period.

Sample Information

Each bacteriological sample must have the proper information written on the sample bottle and report form submitted to the laboratory. The report form must include the public water system’s name and PWS identification number as well as the certified sampler’s name and phone number. Information on the bottle includes:

- sample site identification number and name as designated in sample site plan (e.g. “EP 502 for well 1”)
- type of sample: routine (RT), repeat (RP), additional routine (TR5), or special (SP)
- date and time the sample was collected
- location code if the sample is a repeat samples
2.1.3 Routine Monitoring Requirements

**Number of samples**

The number of routine samples collected is dependent on the average daily population served by the water system during the month of peak use. Table 2.1 presents a summary of the number of routine samples a system must collect.

**Frequency**

Routine samples shall be collected monthly.

DEQ may increase the required sampling frequency of any system based upon sample results or other conditions that indicate a risk to public health. DEQ shall provide the water system with a written explanation of any revised sampling requirements. A system shall implement any increase in sampling frequency immediately upon receipt of the written notice.

Routine samples must be collected at regular time intervals throughout the month if your system serves more than 4,900 people and uses only ground water (except ground water under the direct influence of surface water). If your system serves 4,900 or fewer you may collect all of the samples on the same day, but they must be at different sample sites.

2.1.4 Other Samples

**Additional routine samples**

A system may take bacteriological samples beyond what is required by the routine sampling schedule. If these samples are representative of water used by customers, then the samples will be used in determining compliance with the Total Coliform Rule. All sample results must be submitted to DEQ.

**Special sample**

Special samples may only be collected on water that is not being served to the public and need prior approval from the department. These samples are usually used to determine if adequate disinfection has occurred after storage tank cleaning, installation of new pipe, or pipe repair. Since these samples do not represent water consumed by the system’s population, they are not counted towards routine TCR compliance (they cannot take the place of required routine or repeat samples). However, DEQ may use these samples to determine MCL (maximum contaminant level) compliance.

**New Source**

A system shall collect at least two samples from any new source of water to demonstrate compliance before the source is connected to the public water supply.

<table>
<thead>
<tr>
<th>Population Served</th>
<th>Minimum Number of Routine Samples Per Month</th>
</tr>
</thead>
<tbody>
<tr>
<td>25* to 1,000</td>
<td>1</td>
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<tr>
<td>1,001 to 2,500</td>
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<td>2,501 to 3,300</td>
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<tr>
<td>3,301 to 4,100</td>
<td>4</td>
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<td>4,101 to 4,900</td>
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<td>83,001 to 96,000</td>
<td>90</td>
</tr>
<tr>
<td>96,001 to 130,000</td>
<td>100</td>
</tr>
</tbody>
</table>

* Includes systems that serve less than 25 people but with at least 15 service connections.
Replacement Samples

The laboratory may request a replacement sample if the original sample was not analyzed for one of the following reasons:

- **Too Old** - the sample was collected more than 30 hours before it could be analyzed
- **Container Broke or Leaked** – the sample was compromised en route
- **Insufficient Quantity** – sample was less than 100 mL – laboratory methods require a minimum volume of water for analysis
- **No Date/Time of Collection** – the date and time of collection must be recorded for each sample to ensure the sample was collected within 30 hours of the analysis

**Sample Arrived Frozen or Too Hot** – after a sample freezes or is exposed to high temperatures it is no longer representative of the system’s water.

**Routine sampling is recommended early in the monitoring period so there will be enough time to take a replacement sample for repeat samples if necessary.**

2.1.5 Coliform Positive Results

When a routine bacteriological sample is total coliform positive, the system will be required to submit repeat samples within 24 hours and will be required to conduct increased monitoring the next month.

**Repeat samples**

The system must submit a set of repeat samples within 24 hours of being notified of the positive result. The number of repeat samples required is dependent on the number of total coliform positive samples found. Table 2.2 gives a summary of the required repeat samples and the number of samples required the month following a total coliform positive sample.

The system is responsible to have enough sample bottles on hand at all times to send in repeat samples within 24-hours. All repeat samples must be collected on the same day, unless otherwise authorized by DEQ. The state may waive the 24-hour requirement on a case-by-case basis.

**Location of Repeat Samples**

At least one repeat sample must be taken from the sample site where the original total coliform positive sample was found. Other repeat samples must be collected within five service connections upstream and downstream of the original total coliform positive sample site. Systems that are required to collect a fourth repeat sample may collect it from anywhere in the distribution system. Do not take all repeat samples at the same location unless the system has only one service connection.

The identification number of the original routine sample site for the coliform positive sample shall be included on the bacteriological report for of each repeat sample. Each sample bottle should include the address or specific location the sample was taken.

---

### Table 2.2 Repeat Samples

<table>
<thead>
<tr>
<th>Number of Routine Samples/Month</th>
<th>Number of Repeat Samples</th>
<th>Number Routine Samples Next Month</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/month</td>
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<td>5/month</td>
</tr>
<tr>
<td>4/month</td>
<td>3/positive routine</td>
<td>5/month</td>
</tr>
<tr>
<td>5/month or greater</td>
<td>3/positive routine</td>
<td>Routine Requirements*</td>
</tr>
</tbody>
</table>

*Systems that take 5 or more routine samples per month continue to take the same number of routine samples the month following a total coliform positive sample.
**Increased routine samples next month**

In the month following a total coliform positive sample, systems must collect a minimum of 5 routine samples. This increase in sampling must be conducted regardless of whether or not any repeat samples were positive.

### 2.1.6 Violations

#### Monitoring Violations

Failure to take the required routine samples it is considered a monitoring violation. Failure to collect a routine sample requires Tier 3 public notice.

#### MCL Violations

The maximum contaminant level (MCL) under the Total Coliform Rule is based on the presence or absence of microorganisms and the number or percentage of samples that are found to be positive. An MCL exceedance of the TCR can be considered acute or non-acute depending on what type of microorganisms are present in the monthly samples.

##### Non-Acute MCL Violations

- For systems that are required to take 40 or more samples/month, the MCL is exceeded if more than 5.0 percent of the samples during a month are total coliform positive.
- For systems that take fewer than 40 samples/month, the MCL is exceeded if more than one sample is total coliform positive in any given month.
- Failure to take all required repeat samples constitutes an MCL violation.
- If a system has a non-acute MCL violation it must:
  - Issue a Health Advisory
  - Fulfill all Tier 2 public notice requirements
  - Take increased samples the following month.

##### Acute MCL violations

An acute MCL violation occurs when the MCL is exceeded and one of the following conditions apply:

- A routine sample is total coliform positive and any of the repeat samples associated with that routine sample are fecal coliform or *E. coli* positive.
- A routine sample is fecal coliform or *E. coli* positive and any of the repeat samples associated with that routine sample are total coliform positive.
- A routine sample is fecal coliform or *E. coli* positive and the system fails to collect all required repeat samples.

This type of violation assumes an immediate health risk is present. A system that has an acute MCL violation must take the following actions:

- Contact DEQ within 24 hours
  - Total Coliform Rule Manager phone: 406-444-5314, fax: 406-444-1374
- Issue a Boil Water Order
- Fulfill all Tier 1 public notice requirements
- Take corrective action
- Take increased samples the following month.
2.1.7 Reporting

Routine coliform test results must be submitted to DEQ by the 10th of the month following the end of the monitoring period. For example a September sample is due by October 10th.

DEQ must be notified within 24-hours of any coliform positive sample results. The system must also submit copies of all public notices to DEQ within 10 days of issuance.

2.2 Source Sampling Under the Ground Water Rule

Regulations regarding testing for microbiological contaminants in ground water sources are addressed in the Ground Water Rule (GWR). The goal of the Ground Water Rule is to identify systems that are susceptible to fecal contamination and provide for increased protection of sources that are at risk.

The Ground Water Rule was finalized on November 6, 2006. Its requirements went into effect on December 1, 2009. The federal reference is 40 CFR 141.400-405.

2.2.1 Triggered Source Monitoring

When is source sampling “triggered”?

Sampling is triggered when a system has a positive routine total coliform sample in the distribution system under the TCR and the system does not provide disinfection that meets 4-log (99.99%) inactivation of viruses.

Where is sampling required?

For each TCR positive routine sample, the system must sample at each ground water source that was in use at the time the positive sample was taken. Sampling must be conducted prior to treatment, at the well or another location approved by the DEQ.

When must the sample be taken?

The system must take the source sample within 24 hours of being notified of the TCR positive sample results.

What is the sample tested for?

Most systems will sample for E. coli. Other acceptable fecal indicators are Enterococci and coliphage. The DEQ may require that the system sample for a specific indicator. If they do not specify, however, the system may choose which indicator they want to use.

Are there any exceptions to the required source sampling?

The DEQ may determine, on a case-by-case basis or through specified criteria, that a TCR positive sample is the result of distribution system issues rather than source contamination. If one of the following conditions is met, the system is not required to conduct triggered monitoring.

- The system received approval from DEQ within 24 hours of receiving the positive sample.
- The system’s situation meets criteria set in the Ground Water Rule. If the system uses this exemption, they must notify the DEQ within 30 days.

What happens if a sample is fecal indicator-positive?

If a system is conducting triggered monitoring and has a fecal-indicator positive sample, the system must provide Tier 1 public notice within 24 hours.
DEQ may require corrective action, such as eliminating the source of contamination, removal of the contaminated source, providing an alternate source, or providing 4-log removal or inactivation of viruses.

If DEQ does not require corrective action, the system is required to take 5 additional source samples within 24 hours of learning of the fecal indicator positive sample. If any of the 5 additional samples are fecal indicator-positive, Tier 1 public notice must be provided within 24 hours, and corrective action is required.

2.2.2 Assessment Monitoring

Assessment monitoring is required at the discretion of the state. If the DEQ believes that a source or sources may be at risk, they will inform the system that assessment monitoring is required.

The required monitoring criteria are also at the discretion of DEQ and may include any of the following:

**Which fecal indicator must be sampled for?**
DEQ may require the system to sample for *E. coli*, coliphage, or *Enterococci* or may allow the system to choose the indicator.

**Where must sampling be conducted?**
DEQ may require sampling at each source, only sources that they consider at-risk sources, or perhaps at each entry point.

**What frequency of sampling is required?**
DEQ may require sampling at any frequency (daily, weekly, monthly, quarterly…).

**How long must sampling be conducted?**
Although EPA (Environmental Protection Agency) recommends one year of monitoring, DEQ may require sampling anywhere from one month to multiple years.

If a system is conducting assessment monitoring and has a fecal-indicator positive sample, the system must provide Tier 1 public notice within 24 hours. DEQ will determine if corrective action is required.

2.2.3 Violations

**Monitoring Violations**
Failure to take any required sampling is considered a monitoring violation and requires Tier 3 public notice.

**Treatment Technique Violations**
Although a fecal indicator-positive source sample in and of itself is not a violation, failure to address the contamination can result in a violation. Failure to take DEQ required action or have a state-approved plan in place within 120 days of notification is a treatment technique violation and requires Tier 2 public notice.

2.2.4 Reporting

Routine source water test results must be submitted to DEQ by the 10th of the month following the end of the monitoring period. For example, any September sample result is due by October 10th.

DEQ must be notified within 24-hours of any positive sample results. The system must also submit copies of all public notices to DEQ within 10 days of issuance. Please see Section 6 for further information on public notice.

Written notice of completion of DEQ required corrective action must be provided within 30 days of completion.
If the system does not take a source sample following a TCR positive result in the distribution system because the TCR positive result meets DEQ’s criteria of a “distribution issue” a written notice must be sent to DEQ within 30 days of the TCR positive sample.

2.3 Disinfection

Disinfection is an effective method used to kill harmful microbiological organisms. Disinfection is required for all systems utilizing surface water, is used by groundwater systems if the source is contaminated or at risk of contamination, or if there are risks associated with the distribution system. In addition, some systems provide disinfection to prevent biofilm growth within the distribution system.

However disinfectants, in combination with certain precursors, can form disinfection-by-products that have been linked to cancer and other negative health affects. In addition to the requirements discussed in this section, all systems that provide water that is chemically disinfected must comply with the requirements associated with disinfectants and disinfection by-products discussed in Section 4 of this document.

2.3.1 Mandatory Disinfection of Surface Water Systems

Any system that utilizes surface water must provide full-time disinfection of that source. For these requirements, refer to Surface Water Regulations Summary.

2.3.2 Voluntary Disinfection of Ground Water Systems

Ground water systems that choose to, but are not required by the department to disinfect, must comply with the monitoring requirements outlined in Section 2.3.4. Ground water systems may not begin or discontinue disinfection without prior department review and approval.

The state regulation can be found in ARM 14.38.225 & 229. There is no associated federal regulation.

2.3.3 Consecutive Systems

Systems that purchase chlorinated water must comply with the monitoring requirements as outlined below. For consecutive systems, the entry point is the point at which the purchased water enters the distribution system of the consecutive system.

The state regulation can be found in ARM 14.38.225 & 229. There is no associated federal regulation.

2.3.4 Mandatory Disinfection of Ground Water Systems

Montana regulation ARM 14.38.225 and 14.38.229 set forth conditions under which ground water systems must provide full time disinfection, and provides the monitoring and minimum residual levels the system must meet.

In addition to these requirements, the federal Ground Water Rule may require disinfection of ground water sources and sets forth treatment requirements. These requirements are presented in Section 2.3.5.

A ground water system is required to provide full-time disinfection whenever one or more of the following criteria are met:

- The water may be exposed to a potential source of contamination through loss of pressure that could result in backflow or infiltration conditions
- The water may be exposed to a potential source of contamination through substandard distribution, pumping, or storage facilities
- The water may be exposed to potential source of contamination through a treatment process
- The source is unprotected or poorly protected
• The bacteriological record does not indicate a safe supply based on the criteria listed in ARM 17.38.207 and 17.38.215
• The history or nature of contamination demonstrate that a disinfectant residual is required to ensure safe water
• Any new source drawing from an aquifer with a static water level within 25 feet of the surface

Disinfectant residual

Any system that is required to employ full-time chlorination must
• maintain a chlorine residual of no less than 0.2 mg/l or ppm, at the entry point, using the DPD method or
• maintain a chlorine residual of no less than 0.1 mg/l, at the entry point, using the amperometric titration method or
• maintain a heterotrophic plate count of less than or equal to 500 per milliliter
• a ground water system required to maintain a residual in its distribution system must maintain a minimum chlorine residual of 0.2 mg/l.

Monitoring requirements

Any system that provides full time disinfection (whether mandatory or voluntary) must take one disinfectant residual at each entry point daily.

DEQ has the authority to reduce the number of samples for non-community systems on a case-by-case basis.

Violations

Failure to conduct disinfectant residual monitoring or maintain the minimum disinfectant level constitutes a violation.

Reporting

Systems must record the chlorine residual test results on the ground water chlorination forms supplied by DEQ or accessed via the Internet at http://www.deq.mt.gov/wqinfo/pws/pwsMonitoringForms.mp. Test results must be submitted to DEQ by the 10th of the month following the end of the monitoring period. For example all September sample results are due by October 10th.

2.3.5 Ground Water Disinfection Under the GWR - 99.99 Percent Virus Inactivation

Regulations regarding disinfection of ground water sources are also addressed in the Ground Water Rule (GWR). The Ground Water Rule was finalized on November 6, 2006. Its requirements became effective on December 1, 2009. The federal reference is 40 CFR 141.400-405. Under the GWR, systems that have contaminated ground water sources, based on fecal indicator-positive source samples, will have to take corrective action to address this contamination. One option is to provide full-time disinfection of the contaminated source that provides at least 4-log inactivation of viruses.

Other options are also available, including a combination of filtration and disinfection that provides 4-log treatment, removal of the contaminated source, elimination of the source of contamination, and providing an alternate source. Contact the DEQ for more information about the options available.

If a system is required, or chooses to provide 4-log virus inactivation, the following monitoring requirements must be met to ensure that adequate treatment is provided. Systems that meet these requirements are not subject to triggered monitoring as discussed in Section 2.2.

Disinfectant levels
DEQ will set a minimum disinfectant concentration and/or a required CT (residual concentration x contact time) and a compliance point.

**Monitoring Requirements**

Systems serving more than 3,300 people must provide continuous disinfectant residual monitoring. Smaller systems may choose continuous monitoring or taking a daily grab samples at peak hourly flow.

**Monitoring Violations**

Failure to conduct disinfectant residual monitoring is considered a monitoring violation and requires Tier 3 public notice.

**Treatment Technique Violations**

If the treatment system fails to maintain the required level of disinfection for longer than a 4-hour period, a treatment technique violation is incurred and Tier 2 public notice is required.

**Reporting**

The lowest daily disinfectant level must be submitted to DEQ by the 10th of the month following the end of the monitoring period. For example, all September sample results are due by October 10th.

The system must also report any failure to meet any treatment requirements by the end of the next business day.
3. CHEMICAL REQUIREMENTS

The system owner is responsible for selecting a state certified laboratory to perform the chemical analysis and arrange for the laboratory to send sterilized containers to collect the samples. Follow the directions for sample procedures sent by the laboratory with the sample bottles. Although most laboratories submit results directly to DEQ, the system is ultimately responsible to make sure the test results are submitted. It is recommended that the system verify with the certified laboratory that the laboratory will submit the results. The water system is responsible for the cost of all analyses.

3.1 Nitrate/Nitrite Monitoring Requirements

Water systems are required to sample for nitrate and nitrites under the National Primary Drinking Water Regulations. Nitrates and nitrites are contaminants that have the potential to cause both chronic and acute health issues. Nitrite (and nitrate which is converted by the body to nitrite) when in the blood supply, prevents red blood cells from carrying oxygen to the body. Infants that consume water with high levels of nitrate or nitrite can suffer from methglobanemia or “blue baby” syndrome. This can be fatal if untreated. Chronic exposure to high levels of nitrate or nitrite can cause diuresis, increased starchy deposits, and hemorrhaging of the spleen.

Nitrate and nitrite sampling requirements date back to the National Interim Primary Drinking Water Regulations finalized in 1977. Revised monitoring requirements took effect January 1993. State regulations regarding nitrate and nitrite monitoring can be found in ARM 17.38.203 and 17.38.216. The federal references are 40 CFR 141.23 and 40 CFR 141.62.

3.1.1 Maximum Contaminant Levels (MCL)

- The MCL for nitrate is 10 mg/L
- The MCL for nitrite is 1 mg/L

The laboratory may initially analyze the sample for total nitrogen. If the result is less than 1 mg/L, no further analysis is necessary because neither nitrate nor nitrite MCL could have been reached. If the sample is greater than 1 mg/L, the laboratory will analyze the sample for both constituents to determine if either MCL was exceeded. The action level for nitrate is >50% the MCL or 5mg/L. This requires increased monitoring of a system to determine the potential health risk.

3.1.2 Monitoring Location

Nitrate and nitrite samples shall be collected at each entry point to the distribution system. Sampling points must be representative of the system’s sources (wells or surface) after treatment.

3.1.3 Routine Monitoring Requirements

Initially all system must sample as follows:

- **Ground water systems** must sample annually.
- **Surface water systems** must sample quarterly.

Monitoring may be reduced or increased based on results.

3.1.4 Reduced Monitoring

In some situations, monitoring may be reduced:

- **Ground water systems** cannot reduce to less than annual.
- **Surface water systems** may reduce their monitoring to annually if four consecutive quarter samples are less 50 percent of the MCL. The surface water system must then take quarterly samples in the quarter that previously yielded the highest analytical results. The system must
submit a written request to DEQ and receive written approval before beginning reduced monitoring.

3.1.5 Increased Monitoring

In some situations, monitoring may be increased:

- **Ground water systems** will be increased to quarterly monitoring if any annual sample is greater than or equal to 50 percent of the MCL. DEQ may return the ground water system to annual monitoring if four consecutive quarterly samples are “reliably and consistently” below MCL.

- **Surface water systems** previously reduced to annual monitoring shall return to quarterly monitoring if any sample is greater than or equal to 50 percent of the MCL. DEQ may return the surface water system to annual monitoring if four consecutive quarterly samples are less than 50 percent of the MCL.

3.1.6 Results Over MCL

If a sample is over either the nitrate or nitrate MCL a confirmation sample must be taken within 24 hours of notification of the exceedance. The confirmation sample results will then be averaged with the original sample. It is considered an MCL violation if the average of the two samples exceeds the MCL.

3.1.7 Violations

**Monitoring Violations**

A failure to take a routine nitrate/nitrite sample requires Tier 3 public notification. Failure to take the confirmation sample requires a Tier 1 public notice.

**MCL Violation**

MCL compliance for nitrate and nitrite are based on the average of the initial and the confirmation sample. Exceedance of the MCL or failure to take confirmation sample requires Tier 1 public notification and completion of appropriate treatment.

- **Best Available Technologies**
  If a system cannot comply with the MCL for nitrate or nitrite, treatment may be required. EPA guidance specifies that the Best Available Technologies (BATs) for nitrate/nitrite are ion exchange, reverse osmosis, and electordialysis (nitrate only).

3.1.8 Reporting

Nitrate and nitrite sampling results must be submitted to DEQ by the 10th of the month following the end of the monitoring period. For example a 2009 Annual is due by January, 2010.

Systems shall notify DEQ and complete a public notice within 24 hours of being notified of a MCL violation or failure to take a confirmation sample.

3.2 Inorganic, Volatile Organic and Synthetic Organic Compounds

Water systems are required to sample for eleven inorganic chemical (IOC) contaminants as well as volatile organic chemicals (VOCs) and synthetic organic chemicals (SOCs) under the National Primary Drinking Water Regulations. The presence of these contaminants in drinking water is a health concern primarily due to their potential ability to cause cancer when consumed over long periods of time. The health effects associated with each contaminant are listed in Appendix C.

IOCs, VOCs, and SOCs are regulated under the Phase II and Phase V Rules, which
went into effect in 1992, 1994 respectively. These rules built on the National Primary Interim Drinking Water Regulations by requiring monitoring and setting MCLs for additional contaminants. In addition, the Arsenic standard was revised under the Arsenic Rule which became effective in 2002 and was revised in 2006 to reduce the MCL.

State regulations regarding these contaminants can be found in ARM 17.38.203 and 17.38.216. The federal references are 40 CFR 141.23-24 and 40 CFR 141.61-62.

3.2.1 Maximum Contaminant Levels

A table summarizing the Maximum Contaminant Levels (MCLs) for inorganic, volatile organic, and synthetic organic compounds that are regulated under the Safe Drinking Water Act is included in Appendix C.

**Arsenic**

Although arsenic is regulated in an individual rule, it is included in the list of inorganic chemicals. Monitoring requirements listed below apply to the new arsenic standard.

**Fluoride**

At low levels, fluoride can help prevent cavities, but at higher levels fluoride may cause cosmetic discoloration of children’s permanent teeth. For that reason, in addition to the MCL of 4.0 mg/L for fluoride, EPA has set a secondary MCL (SMCL) of 2.0 mg/L. Exceedance of the SMCL is not a violation, but public notice is required to inform consumers.

3.2.2 Monitoring Location and Compositing

Inorganic, volatile organic, and synthetic organic samples must be collected at each entry point to the distribution system. Ground water systems must collect one sample at each entry point that is representative of each source of water after treatment. Surface water systems must collect one sample at a point that represents each source or at each entry point after treatment. Compositing of up to 5 sample points is allowed. If a composited sample exceeds 1/5 of the MCL, individual samples from each sample point must be collected and analyzed.

3.2.3 Monitoring and the Standardized Monitoring Framework

Inorganic, volatile organic, and synthetic organic compounds monitoring requirements follow the Standardized Monitoring Framework developed by EPA to streamline drinking water monitoring requirements. EPA has established nine-year cycles that are broken into smaller monitoring periods. Each nine-year cycle is comprised of three three-year compliance periods. Each three-year compliance period may be further divided into annual, quarterly, and monthly periods. Waivers obtained from DEQ may allow water systems to reduce their monitoring to a longer compliance period.

3.2.4 Routine Monitoring

Initially systems follow routine monitoring requirements. Monitoring may be reduced or increased based on results.

**Inorganics**

Systems are required to conduct routine sampling for inorganic chemicals. The sampling frequency depends on the type of source water.

- **Ground water systems** are required to collect one sample per three-year compliance period.
- **Surface water systems** are required to collect one sample annually.

**Volatile and Synthetic Organics**

Initially systems are required to collect four consecutive quarterly samples for volatile and synthetic organics.
3.2.5 Reduced Monitoring

**Inorganic Compounds**
A waiver for reduced monitoring of inorganics may be granted by DEQ provided surface systems have monitored annually for 3 consecutive years and ground water systems have conducted a minimum of 3 rounds of monitoring. The frequency of the monitoring is determined by DEQ.

**Volatile Organic Compounds**
If no VOCs are detected during the initial round of sampling, systems may be allowed to decrease their sampling frequency beginning in the second compliance period.

- **Ground water systems** must take at least one sample each year at each sampling point. After three consecutive years of annual sampling with no detection, sampling at that point may be further reduced to one sample every three years. The initial year of quarterly sampling may count as one of the three years of no detection.

- **Surface water systems** must sample annually.

**Synthetic Organic Compounds**
Systems may be allowed to decrease their sampling frequency in the second and subsequent compliance periods for contaminants undetected during the initial compliance period.

- Systems serving more than 3,300 people may reduce their sampling frequency to two samples every 3 years.
- Systems serving 3,300 or fewer people may reduce their sampling to one sample every three years.

3.2.6 Increased Monitoring

**Inorganic Chemicals**
Any inorganic chemical sample which exceeds the MCL will trigger quarterly monitoring to begin in the compliance quarter following the exceedance. The monitoring frequency may be later reduced when the compound levels are shown to be “reliably and consistently below the MCL.” This will require a minimum collection of 2 consecutive quarterly samples for ground water systems and 4 consecutive quarterly surface water samples.

**Volatile Organic Compounds**
If a sampling exceeds the method detection limit (MDL) of 0.0005 mg/l for any VOC, the water system must begin quarterly sampling at that point in the next calendar quarter and must continue sampling quarterly until DEQ determines the sampling point is reliably and consistently below the MCL.

**Synthetic Organic Compounds**
If a synthetic organic contaminant is detected at any sampling point, the water system must begin sampling quarterly at that sampling point in the next quarter and continue sampling quarterly, until DEQ determines that the sampling point is reliably and consistently below the MCL.

**Confirmation Samples**
Confirmation samples may be required within 2 weeks of an exceedance.

3.2.7 Results over MCL

Any inorganic, volatile organic, and synthetic organic compounds sample which exceeds the MCL will trigger quarterly monitoring to begin in the compliance quarter following the exceedance. A system is not considered in violation of the MCL until it has completed one year of triggered increase sampling and the sample results based on a Running Annual Average exceed the MCL.
3.2.8 Violations

**Monitoring Violation**

A failure to take any required sample for IOC, VOC, and/or SOC constitute a monitoring violation and requires a Tier 3 public notice be issued.

**MCL Violation**

MCL compliance for inorganic, volatile organic, and synthetic organic compounds is based on a running annual average of quarterly monitoring. MCL violations require a Tier 2 public notice be issued.

- **Best Available Technologies**
  
  If a system cannot comply with the MCL for IOCs, VOCs and SOCs, treatment may be required. EPA guidance provides specific Best Available Technologies (BATs) for each contaminant. Refer to 40 CFR 141.61(b) for organics and 40 CFR 141.62(c) for inorganics.

3.2.9 Statewide Waivers

Under the statewide waivers, public water supplies are not required to sample for:

- Endothall
- Dioxin
- Asbestos at the source
- Diquat
- Ethylene dibromide
- Cyanide
- Glyphosate
- Dibromochloropropane

Additionally, small water systems (3,300 or less) may be waived from initial quarterly monitoring requirements for the organic chemicals (includes VOCs, PCBs, SOCs) by completing one round of organic chemical sampling without detects. This statewide waiver applies only to initial baseline requirements. Repeat sampling during subsequent compliance periods will be required except where “use” or “susceptibility” waivers have been granted.

Additional information for state-wide waivers is provided in the Appendix D.

3.2.10 System-Wide Waivers

Chemical monitoring waivers reduce sample frequency in a compliance period or compliance cycle. Information to support the waiver must be provided by the PWS for consideration. A waiver must be given in writing by DEQ and will specify which chemical(s) are included in the waiver, the time during which the waiver is in effect, and the sampling required for renewing the waiver. Monitoring requirements are fairly complex based on quarterly, semi-annual, annual, and tri-annual requirements within 3-year compliance periods and 9-year compliance cycles.

Additional information regarding system-wide waivers is provided in the Appendix D.

3.2.11 Reporting

Chemical contaminant sampling results must be submitted to DEQ by the 10th of the month following the end of the monitoring period. For example a September sample is due by October 10th.

3.3 Radiological Contaminants

Water systems are required to sample for radiological contamination under the National Primary Drinking Water Regulations. Long-term exposure to radionuclides may cause cancer. In addition, exposure to uranium may have toxic effects on the kidneys. The health effects associated with each contaminant are listed in Appendix C.

The Radionuclides Rule, finalized in December 2000 built on the requirements existing in the National Primary Interim Drinking Water Regulations by adding an

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**Systems Affected:**

All community systems
MCL for uranium and revising the monitoring requirements.

State regulations regarding radiological monitoring can be found in ARM 17.38.206 and 17.38.216. The federal references are in 40 CFR 141.25-26 and 40 CFR 141.66.

3.3.1 Maximum Contaminant Levels

A table summarizing the Maximum Contaminant Levels (MCLs) for Radiological Contaminants is included in the Appendix C. Radiological contaminants regulated under the Safe Drinking Water Act are Radium-226 and Radium-228 (combined), gross alpha particle activity, Uranium, and gross beta particle activity. MCL compliance for radionuclides is based on a running annual average.

3.3.2 Monitoring Location and Compositing

Radionuclide samples must be collected from each entry point to the distribution system. For gross alpha activity, radium-226, radium-228, or uranium, a system may composite up to four consecutive quarterly samples from a single entry point if the analysis is done within a year of the first sample.

3.3.3 Routine Monitoring

Systems must collect four consecutive quarterly samples at all sampling points for gross alpha particle activity, radium-226, radium-228, and uranium monitoring. Systems designated as vulnerable by DEQ must collect quarterly samples for beta particle emitters and annual samples for tritium and strontium-90.

Vulnerable systems must collect quarterly samples for beta particle emitters and annual samples for tritium and strontium-90.

3.3.4 Reduced Monitoring

A system may go to a reduced sampling schedule for gross alpha particle activity, radium-226, radium-228, and uranium monitoring if the average sample results from routine sampling are less than or equal to the MCL. There are four options for reduced monitoring based on sample results:

<table>
<thead>
<tr>
<th>If the Running Annual Average is:</th>
<th>Then Reduced Monitoring is:</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; Detection Limit</td>
<td>One sample every 9 years</td>
</tr>
<tr>
<td>≥ Detection Limit but ≤ ½ MCL</td>
<td>One sample every 6 years</td>
</tr>
<tr>
<td>&gt;1/2 MCL but ≤ MCL</td>
<td>One sample every 3 years</td>
</tr>
</tbody>
</table>

The system may reduce monitoring to one sample every 3 years if the gross beta particle activity minus the naturally occurring potassium-40 activity is ≤ 50 pCi/L (picocuries per liter).

3.3.5 Increased Sampling

Systems must use the samples collected during the reduced monitoring to determine the monitoring frequency for subsequent monitoring periods. This could increase the monitoring frequency.

Any gross alpha particle activity, radium-226, radium-228, or uranium sample which exceeds the MCL will trigger quarterly monitoring to begin in the compliance quarter following the exceedance. Monitoring frequency may be reduced when the system has results from four consecutive quarters that are below the MCL. The system must speciate as required by DEQ and sample at the initial monitoring frequency if gross beta particle activity minus the naturally occurring potassium-40 activity exceeds 50 pCi/L.

If a beta particle or photon emitter sample exceeds the MCL, the system must conduct monthly monitoring the following month at that sample point.
### Table 3.2 Reduced Monitoring Options for Gross Alpha Particle Activity

<table>
<thead>
<tr>
<th>If the Running Annual Average is:</th>
<th>Then Reduced Monitoring is:</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; Detection Limit</td>
<td>One sample every 9 years</td>
</tr>
<tr>
<td>≥ Detection Limit but ≤ ½ MCL</td>
<td>One sample every 6 years</td>
</tr>
<tr>
<td>&gt; 1/2 MCL but ≤ MCL</td>
<td>One sample every 3 years</td>
</tr>
</tbody>
</table>

#### 3.3.6 Violations

**Monitoring Violation**

A failure to take any required sample for radionuclides constitutes a monitoring violation and requires a Tier 3 public notice be issued within 1 calendar year.

**MCL Violation**

MCL compliance is based on the running annual average. Radiological contaminants MCL exceedance violations require Tier 2 public notice be issued.

- **Best Available Technologies**
  
  For radioactive contaminants, there are non-treatment options as well as Best Available Technologies specific to the radionuclide of concern. For more details, refer to 40 CFR 141.66(g) or contact DEQ.

#### 3.3.7 Reporting Requirements

Radiological contaminant test results must be submitted to DEQ by the 10th of the month following the end of the monitoring period. For example the September sample is due by October 10th.

#### 3.4 Lead and Copper

Control of lead and copper in drinking water is addressed in the Lead and Copper Rule (LCR). It was developed to reduce the risk of expose to lead that can cause damage to the brain, red blood cells and kidneys, especially for infants, young children and pregnant women, as well as to reduce the expose to copper that can cause stomach and intestinal distress, liver or kidney damage, and complications of Wilson’s disease.

The LCR protects public health by minimizing lead and copper levels in drinking water, primarily due to water corrosivity. It establishes action levels (ALs) based on tap water sampling. Exceedance of these ALs can trigger additional requirements for the system such as: water quality parameter (WQP) monitoring, optimal corrosion control treatment (OCCT), source water monitoring/treatment, public education, and lead service line replacement (LSLR).

The original Lead and Copper Rule (LCR) became effective in 1992. In October 2007, EPA published revisions to the LCR. These new requirements became effective in December 2007. The revisions are meant to enhance the implementation of the LCR in areas of monitoring, treatment, customer awareness and LSLR, as well as, improve compliance with public education requirements. The revisions also ensure drinking water customers receive information needed to help them limit their exposure to lead in drinking water. See Appendix E for a summary of these revisions.

State regulations regarding lead and copper can be found in ARM 17.38.203, 208, 216 and 234. The federal references are 40 CFR 141.40-43 and 40 CFR 141.80-91.
3.4.1 Lead and Copper Tap Monitoring

All Community (C) and Non-transient non-community (NTNC) water supplies must collect first-draw samples at taps in homes/building that are at high risk of lead and copper contamination. The LCR establishes a tiering system for prioritizing sampling sites (see table below). A materials evaluation is required to help classify sampling sites into tiers.

<table>
<thead>
<tr>
<th>Table 3.3 Tiering Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Community</strong></td>
</tr>
<tr>
<td><strong>Tier 1</strong> sampling sites are single family residences (SFR):</td>
</tr>
<tr>
<td>- with copper pipes with lead solder installed after 1982 <em>(but before the effective date of the State’s lead ban)</em> or contain lead pipes; and/or</td>
</tr>
<tr>
<td>- that are served by a lead service line.</td>
</tr>
<tr>
<td><em>Multiple-family residences (MFRs) may count as Tier 1 sites when they comprise at least 20% of the structures served by the system.</em></td>
</tr>
<tr>
<td><strong>Tier 2</strong> sampling sites consist of buildings, including MFRs:</td>
</tr>
<tr>
<td>- with copper pipes with lead solder installed after 1982 <em>(but before effective date of the State’s lead ban)</em> or contain lead pipes; and/or</td>
</tr>
<tr>
<td>- that are served by a lead service line.</td>
</tr>
<tr>
<td><strong>Tier 3</strong> sampling sites are SFRs with copper pipes having lead solder installed before 1983.</td>
</tr>
</tbody>
</table>

**Representative Sample:** Community or non-transient non-community systems that cannot collect enough samples from tiered sites, must collect them from sites where the plumbing is similar to that used at other sites served by the water system.

Samples must be collected at Tier 1 sites. If an insufficient number of Tier 1 sites exist, then samples must be collected from Tier 2 sites, followed by Tier 3 sites, and finally by representative sites. Samples must be 1-liter in volume and be taken from an interior tap where the water has stood in the pipes for at least six hours. Tap aerators must not be removed prior to sample collection. Systems or residents can collect these samples. (Refer to Appendix E for a copy of Homeowners instructions for sample collection).

The frequency of monitoring and number of samples required is based on population and lead and copper tap 90th percentile results. See Table 3.4 for the number of samples to be collected under standard and reduced monitoring. Systems must conduct monitoring every 6 months unless they qualify for reduced monitoring.

**Lead and copper monitoring can be divided into two broad categories:**

- **Standard monitoring** includes all monitoring other than reduced monitoring. Standard monitoring is conducted at 6-month intervals. Both initial monitoring (required of all systems) and follow-up monitoring (corresponds to the two consecutive 6-months after a system completes the installation of corrosion control and is only required for systems that install treatment) are a type of standard monitoring.
**Table 3.4 Lead and Copper Tap Monitoring**

<table>
<thead>
<tr>
<th>Size Category</th>
<th>System Size</th>
<th>Number of Lead/Copper Tap Sample Sites&lt;sup&gt;1&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Standard</td>
</tr>
<tr>
<td>Large</td>
<td>&gt; 100K</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>50,001 - 100K</td>
<td>60</td>
</tr>
<tr>
<td>Medium</td>
<td>10,001 - 50K</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td>3,301 - 10K</td>
<td>40</td>
</tr>
<tr>
<td>Small</td>
<td>501 - 3,300</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>101 - 500</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>≤ 100</td>
<td>5</td>
</tr>
</tbody>
</table>

<sup>1</sup> With written DEQ approval, PWSs can collect < 5 samples if all taps used for human consumption are sampled.

- **Reduced monitoring** corresponds to monitoring that occurs at a reduced frequency and number of sample locations. See Table 3.5 for the reduced monitoring criteria.

**Table 3.5 Criteria for Reduced Lead and Copper Tap Monitoring**

<table>
<thead>
<tr>
<th></th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual</td>
<td>1. PWS serves ≤ 50,000 people and is ≤ both ALs for 2 consecutive 6-month monitoring periods; or 2. Any PWS that meets optimal WQPs (OWQPs) and is ≤ lead AL for 2 consecutive 6-month monitoring periods.</td>
</tr>
<tr>
<td>Triennial</td>
<td>1. PWS serves ≤ 50,000 people and is ≤ both ALs for 3 consecutive years of monitoring; or 2. Any PWS that meets OWQP specifications and is ≤ lead AL for 3 consecutive years of monitoring; or 3. Any PWS with 90&lt;sup&gt;th&lt;/sup&gt; percentile lead and copper levels ≤ 0.005 mg/L and ≤ 0.65 mg/L, respectively, for 2 consecutive 6-month monitoring periods (i.e., accelerated reduced Lead/copper tap monitoring).</td>
</tr>
<tr>
<td>Every 9 years</td>
<td>PWS serves ≤ 3,300 people and meets monitoring waiver criteria.</td>
</tr>
</tbody>
</table>

**Notes:**
1. Under the LCR Short Term Revisions (STR), systems can no longer qualify for reduced lead and copper tap monitoring based solely on meeting their OWQPs but also must be at or below the lead action level.
2. Systems that no longer meet the reduced monitoring criteria must return to standard 6-month monitoring.

### 3.4.2 Monitoring and Compliance Periods

The 2007 LCR STR clarifies the definitions of “monitoring period” and “compliance period”.

- **Monitoring period** is the specific period in which water systems must conduct the required monitoring. For systems on a reduced monitoring schedule (i.e., annual, triennial, or nine-year monitoring), the monitoring period is June to September or some other DEQ-designated consecutive four-month period during normal operation when the highest lead levels are likely to occur.

- **Compliance period** is a 3-year calendar period. Systems on triennial monitoring must conduct their monitoring within a four-month consecutive period every 3 years. This prevents the possibility of exceeding more than 3 years between sampling events or spreading sampling out over the 3-year period.
3.4.3 Consumer Notice of Lead Tap Water Monitoring Results

The LCR STR requires all community and non-transient non-community systems to provide individual lead tap results to people who receive water from sites that were sampled, regardless of whether the results exceed the lead AL. The notification must:

- be provided within 30 days of when the system learns of the results.
- include the results of lead tap water monitoring for the tap that was tested, an explanation of the health effects of lead, steps consumers can take to reduce exposure to lead in drinking water, contact information for the water utility, the maximum contaminant level goal (MCLG) for lead of 0 and the lead AL of 0.015 mg/L, and the following definitions for these two terms:
  - The MCLG is the level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety. The action level is the concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.
- be mailed for community systems or posted for non-transient non-community systems.


PWSs must provide DEQ with a sample consumer notification and certification of its proper delivery within 3 months after the end of the applicable monitoring period. See Appendix E for a sample letter and certification form.

3.4.4 Consumer Confidence Report (CCR)

The LCR STR requires all community systems to provide a short informational notice in their CCR about lead irrespective of whether the system has detected lead in any of its samples. PWSs must use the mandatory language below unless DEQ has given permission to use alternative language (e.g., change flushing time). Also refer to Section 8 for more detail on CCRs.

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. The utility is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at http://www.epa.gov/safewater/lead.

3.4.5 Action Levels

When the 90th percentile of a system’s lead and/or copper tap samples exceeds the ALs outlined in the Table 3.6, PWSs must carry out additional LCR monitoring and and treatment technique requirements. An AL exceedance is not a violation; however, failure to complete any of the follow-up requirements is (See Section 3.4.6 for these requirements.)

To calculate the 90th percentile level, follow these steps.

If You Collect More than 5 Samples

Step 1: Place lead results in ascending order (from lowest to highest value).

Step 2: Assign each sample a number, 1 for lowest value.
Step 3: Multiply the total number of samples by 0.9.

Step 4: Compare the 90th percentile level to the AL of 0.015 mg/L (can also be expressed as 15 parts per billion (ppb)). If your 90th percentile value is higher than 0.015 mg/L, you have an exceedance.

Repeat this procedure for copper sample results, except compare the 90th percentile copper level against its AL of 1.3 mg/L. If your 90th percentile value is greater than 1.3 mg/L, you have an exceedance.

If You Collect 5 Samples

Step 1: Place lead or copper results in ascending order.

Step 2: The average of the 4th and 5th highest sample is your 90th percentile level.

Step 3: Compare the 90th percentile level against the lead or copper AL.

If DEQ Allows You to Collect Fewer than 5 Samples

Step 1: Place lead or copper results in ascending order.

Step 2: Compare the highest sample value (this is your 90th percentile level) against the lead or copper AL.

If you serve 50,000 or fewer people and never exceed an AL, you only have to conduct periodic lead and copper tap monitoring. No other monitoring or treatment requirements apply. This is illustrated in Exhibit 4-1 below.

Follow-up Actions Resulting from Lead and Copper Tap Monitoring

CWS or NTNCWS Collects Lead and Copper Tap Samples

- **90th Percentile Is At or Below Both Action Levels**
  - Conduct periodic lead and copper tap monitoring

- **90th Percentile Exceeds the Lead Action Level (15 ppb)**
  - Begin LSLR replace 7% of LSLs per year
  - Conduct public education due within 60 days

- **90th Percentile Exceeds the Copper Action Level (1.3 mg/L)**
  - Begin CCT steps includes WQP monitoring
  - Conduct source water monitoring Install SOWT, if needed
  - Conduct periodic lead and copper tap monitoring

1 Includes systems serving ≤ 50,000 people.
2 Includes serving more than 50,000 people, irrespective of their 90th percentile levels.
3 Counted from the end of the monitoring period with the lead ALE.
4 Required if lead action level is exceeded after treatment.
3.4.6 Treatment Technique Requirements when ALs Are Exceeded

**Water quality parameter monitoring**

Systems that serve >50,000 people or exceed either AL must collect WQP samples. This monitoring is used to determine water corrosivity, to help DEQ identify the type of OCCT to be installed and how it should be operated. Table 3.7 includes the most frequently analyzed WQPs.

Prior to OCCT installation, samples are collected at taps and each entry point to the distribution systems (EPTDS) during monitoring period(s) in which the AL is exceeded (See Table 3.8 for tap sample number). After OCCT installation, follow-up monitoring is conducted during 2 consecutive 6-month periods. After follow-up monitoring, DEQ sets optimal WQP (OWQP) specifications that define OCCT. Monitoring continues at a frequency specified by DEQ. Reduced tap WQP monitoring is available for PWSs that operate OCCT that meet their OWQP specifications.

### Table 3.7 Water Quality Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specific</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH¹</td>
<td>Orthophosphate²</td>
</tr>
<tr>
<td>Alkalinity</td>
<td>Silica³</td>
</tr>
<tr>
<td>Calcium</td>
<td>Temperature¹</td>
</tr>
<tr>
<td>Conductivity</td>
<td></td>
</tr>
</tbody>
</table>

1 Measured on-site.  
2 Applies when a phosphate-containing inhibitor is used.  
3 Applies when a silicate-containing inhibitor is used.

### Table 3.8 Number of WQP Tap Sample Sites

<table>
<thead>
<tr>
<th>System Size</th>
<th>Standard</th>
<th>Reduced</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 100K</td>
<td>25</td>
<td>10</td>
</tr>
<tr>
<td>100K - 10,001</td>
<td>10</td>
<td>7</td>
</tr>
<tr>
<td>3,301 - 10K</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>501 - 3,300</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>≤500</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

**Public education**

Public education is only required if the lead AL is exceeded. The LCR STR clarify that delivery of public education materials must be completed within 60 days from the end of the monitoring period in which the lead AL was exceeded.

There is no education requirement for exceeding copper ALs. Materials distributed to the public will provide the system’s customers with information regarding health effects, sources, and what can be done to reduce lead exposure. These materials include; billing inserts sent directly to customers, pamphlets or brochures distributed at health centers and public service announcements to be submitted periodically to television and radio stations. Templates are also available in the public education guidance documents at [http://www.epa.gov/safewater/lcrmr/compliancehelp.html](http://www.epa.gov/safewater/lcrmr/compliancehelp.html).
**Optimal Corrosion control treatment**

OCCT is required for all systems serving more than 50,000 people and for those serving 50,000 or fewer people that exceed either the lead or copper AL. Systems must recommend OCCT within 6 months following the end of the monitoring period where the systems exceed the action level. A corrosion control study is required for large systems. If DEQ determines a study is required for small or medium systems, it must be completed within 18 months. Once DEQ makes a determination on the type of OCCT to be used the system has 24 months to install the treatment. Systems installing OCCT are subject to two, 6-month periods of follow-up monitoring. After follow-up monitoring DEQ will determine the system’s monitoring status. Small and medium systems with 2 consecutive 6-month monitoring periods without any lead or copper AL exceedances may discontinue OCCT steps.

**Source water monitoring and treatment**

Within 6 months of exceeding a lead or copper AL all systems are required to collect source water samples for lead and copper. This monitoring is needed to determine the contribution of lead and copper from the system’s source water to its tap water. A source water treatment (SOWT) recommendation must also be made to DEQ within 6 months end of the monitoring period of the exceedance (can include a recommendation that no treatment is needed). If DEQ requires source water treatment, the system will have 24 months to install it. After installing the treatment, systems must collect one sample from every entry point during 2 consecutive 6 month monitoring periods. DEQ will designate maximum permissible levels (MPLs) for lead and copper. These MPLs will be the maximum concentrations of lead and copper allowed into your system after SOWT. Ground water PWSs are required to monitor during 3-year compliance periods; surface water PWSs must monitor annually. Monitoring may be reduced to every nine years if MPLs are not exceeded for 3 consecutive compliance periods for ground water systems and for 3 consecutive years for surface water systems.

**Lead service line replacement (LSLR)/Lead service line monitoring**

Systems are required to begin LSLR if they continue to exceed the lead AL after installing OCCT and/or SOWT. At least 7% of a system’s lead service lines (LSLs) must be replaced annually. If a sample from a LSL is \( \leq 0.015 \text{ mg/L} \), it is considered “replaced through testing” and does not need to be physically removed. If only a portion of the LSL is replaced (e.g., privately-owned portion of the LSL is not replaced), the PWS must: 1) notify customers at least 45 days prior to replacement about the potential for increased lead levels; and 2) collect samples within 72 hours of replacement; 3) notify individuals served by the partially replaced line within 3 days of receipt of the results. A system can discontinue LSLR whenever its lead 90th percentile tap results are at or below the action level for 2 consecutive 6-month monitoring periods. A subsequent lead AL exceedance triggers the system back into LSLR. In addition, the LCR STR require any LSL that was “replaced through testing” to be re-evaluated if the system re-exceeds the lead AL.

The LCR STR clarify that a system has exceeded an AL during the last day of the monitoring period in which the exceedance occurs (e.g., on September 30). Thus, the deadlines for completing the follow-up activities (described above) are calculated from the end of the monitoring period.

3.4.7 Reporting

All systems must report sampling-related information to DEQ within 10 days of the end of the applicable monitoring period. Thus, for systems on reduced lead and copper monitoring, this information is due to DEQ on October 10. Additional reporting requirements regarding LSLR, public education reporting requirements, waivers and the addition of new sources exist. Information on these conditional reporting requirements can be obtained from DEQ or from federal rule language.

The LCR STR also requires water systems to obtain approval from DEQ before implementing any long-term changes in water treatment or adding a new source of water. Notification must occur as early as possible prior
to treatment change. Upon approval of the plan DEQ may require the system to undertake baseline lead and copper monitoring.

3.4.8 Record Keeping

Systems must retain original records of all sampling data and analyses, reports, surveys, letters, evaluations, schedules, state determinations, and any other information required by the LCR for a minimum of 12 years.

3.4.9 Additional Information

Several guidance documents have been developed to help water systems understand and comply with the requirements of the LCR. Additional information is available at [http://www.epa.gov/safewater/lcrmr/compliancehelp.html](http://www.epa.gov/safewater/lcrmr/compliancehelp.html), the Safe Drinking Water Hotline at 1-800-426-4791, or from your DEQ representative.

3.5 Secondary Drinking Water Standards

Secondary drinking water standards address contaminants in drinking water that primarily affect the aesthetic qualities relating to the public acceptance of drinking water. Health implications as well as aesthetic degradation may also exist at considerably higher concentrations of these contaminants. The regulations and action levels are not enforceable but are intended as guidelines. The action levels are provided in Table 3.9 below.

DEQ recommends that the secondary contaminants be monitored at the same frequency as the inorganic chemicals contaminants listed in Section 3.2. More frequent monitoring may be appropriate for specific parameters such as pH, color, odor, or others under certain circumstances as directed by DEQ.

<table>
<thead>
<tr>
<th>Contaminant</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum</td>
<td>.05-.2 mg/l</td>
</tr>
<tr>
<td>Chloride</td>
<td>250 mg/l</td>
</tr>
<tr>
<td>Color</td>
<td>15 color units</td>
</tr>
<tr>
<td>Copper</td>
<td>1.0 mg/l</td>
</tr>
<tr>
<td>Corrosivity</td>
<td>Non-corrosive</td>
</tr>
<tr>
<td>Fluoride</td>
<td>2.0 mg/l</td>
</tr>
<tr>
<td>Foaming agents</td>
<td>.5 mg/l</td>
</tr>
<tr>
<td>Iron</td>
<td>.3 mg/l</td>
</tr>
<tr>
<td>Manganese</td>
<td>.05 mg/l</td>
</tr>
<tr>
<td>Odor</td>
<td>3 threshold odor number</td>
</tr>
<tr>
<td>pH</td>
<td>6.5-8.5</td>
</tr>
<tr>
<td>Silver</td>
<td>.1 mg/l</td>
</tr>
<tr>
<td>Sulfate</td>
<td>250 mg/l</td>
</tr>
<tr>
<td>Total dissolved solids</td>
<td>500 mg/l</td>
</tr>
<tr>
<td>Zinc</td>
<td>5 mg/l</td>
</tr>
</tbody>
</table>
4. DISINFECTANTS AND DISINFECTION BYPRODUCTS

The Stage 1 and Stage 2 Disinfectants and Disinfection Byproduct Rules (DBPR) regulate the levels and monitoring requirements of disinfectants and disinfection by-products for systems that provide water treated with disinfectants. While disinfectants are effective in controlling harmful microorganisms, they react with natural organic and inorganic matter in source water and distribution systems to form DBPs (disinfection byproducts). Results from toxicology studies have shown several DBPs to be cancer-causing agents in laboratory animals. Others have been shown to cause adverse reproductive or developmental effects in laboratory animals. In addition, disinfectants, at high levels, can have adverse health effects.

The Stage 1 DBPR was adopted by EPA in 1998 and superseded the 1979 Total Trihalomethanes (TTHM) standard. In 2005 EPA adopted the Stage 2 DBPR which built upon the Stage 1 DBPR and strengthened public health protection.

Under the Stage 2 DBPR, some systems will conduct (or may have already conducted) an evaluation of their distribution systems known as an Initial Distribution System Evaluation (IDSE). The IDSE helps the system identify the locations in the distribution system with high DBP concentrations, and therefore the most appropriate locations to conduct DBP sampling. All systems will develop a new monitoring plan for when and where TTHM and HAA5 (five haloacetic acids) sampling will take place in the distribution system. Requirements regarding the IDSE are not covered in this document. The following table shows the distribution of how the Montana systems were classified:

<table>
<thead>
<tr>
<th>Schedule</th>
<th>Population</th>
<th>VSS/40/30</th>
<th>SM</th>
<th>SSS</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>50K-100K</td>
<td>WH 6</td>
<td>3</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>10K-50K</td>
<td>CC 3</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>&lt;10K</td>
<td>WH 121</td>
<td>48</td>
<td>28</td>
<td>0</td>
</tr>
<tr>
<td>TOTALS</td>
<td></td>
<td></td>
<td>130</td>
<td>53</td>
<td>34</td>
</tr>
</tbody>
</table>

WH – Water Haulers
CC – Consecutive Connections to large systems.
SSS – System Specific Test designed for a specific system. (Mainly large systems)
SM – Standard Monitoring (basic IDSE)

The dates by which systems must begin complying with the new Stage 2 DBPR requirements are based on system size and are shown Table 4.1. By this date, systems must submit their new monitoring plan, begin sampling at the new sites, begin calculating compliance based on locational running annual average, and are subject to conducting operational evaluations when the operational evaluation level is exceeded.
The state regulations adopting the Stage 1 DBPR the Stage 2 DBPR can be found in ARM 17.38.216. The federal reference for the Stage 1 DBPR is 40 CFR 141.130-135 and for the Stage 2 DBPR is 40 CFR 141.600-629.

### Table 4.1 Stage 2 DBPR Compliance Dates

Systems that are part of a combined distribution system (purchase from or sell to another system) comply based on the schedule of the largest system in the combined distribution system.

<table>
<thead>
<tr>
<th>SYSTEM SIZE:</th>
<th>COMPLIANCE DATE¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Systems serving 100,000 or more (Schedule 1)</td>
<td>April 1, 2012</td>
</tr>
<tr>
<td>Systems serving 50,000-99,999 (Schedule 2)</td>
<td>October 1, 2012</td>
</tr>
<tr>
<td>Systems serving 10,000-49,999 (Schedule 3)</td>
<td>October 1, 2012</td>
</tr>
<tr>
<td>Systems serving fewer than 10,000 (Schedule 4)</td>
<td>October 1, 2013 or October 1, 2014²</td>
</tr>
</tbody>
</table>

¹DEQ may grant up to an additional 24 months for compliance for systems that require capital improvements.

²The later date is for systems required to conduct Cryptosporidium monitoring under LT2ESWTR (Long Term 2 Enhanced Surface Water Treatment Rule)

### 4.1 Disinfectants

#### 4.1.1 Maximum Residual Disinfectant Levels (MRDL)

- The MRDL for Chlorine is 4.0 mg/L as Cl₂
- The MRDL for Chloramines is 4.0 mg/L as Cl₂
- The MRDL for Chlorine Dioxide is 0.8 mg/L

#### 4.1.2 Monitoring Locations and Requirements

Monitoring requirements are based on the type of disinfectant used. There are no provisions for reduced or increased monitoring (other than additional sampling specified for chlorine dioxide systems). Systems that use a combination of disinfectants must sample for each disinfectant used.

**Systems that use Chlorine and/or Chloramines**

Sample for chlorine and/or chloramines at the same location and frequency as TCR sampling.

**Systems that use Chlorine Dioxide**

Sample for chlorine dioxide daily at the entrance to the distribution system. If any daily sample exceeds the MRDL, the system must take 3 samples the following day. The location of these additional samples is dependent on disinfection practices of the system. Systems that use chlorine dioxide need to familiarize themselves with these requirements.

#### 4.1.3 Violations

**Monitoring Violations**

Other than for chlorine dioxide, MRDL monitoring violations require Tier 3 public notice.

**MRDL Violations for systems that use Chlorine and Chloramines**

Chlorine and chloramine MRDL violations are based on a running annual average (calculate monthly averages and compute compliance quarterly) and require Tier 2 public notice.
Monitoring and MRDL Violations for Systems that use Chlorine Dioxide

The exception to both calculations of MRDL violation as well as public notice requirements for monitoring and MRDL violations is for the systems that use chlorine dioxide. Chlorine dioxide MRDL violations can be acute or nonacute. Systems that have an acute chlorine dioxide MDRL violation must provide Tier 1 public notice and take immediate action to lower the level of chlorine dioxide. Systems utilizing chlorine dioxide need to familiarize themselves with the unique requirements for this disinfectant.

4.1.4 Reporting

Systems that use Chlorine or Chloramine

Systems using chlorine or chloramines required to sample quarterly or more frequently must report the following information to DEQ within 10 days after the end of each quarter in which samples were collected. Systems required to sample less frequently must report within 10 days after the end of each monitoring period in which samples were collected.

- Number of samples taken each month of the last quarter
- Monthly average of all samples taken each month
- Average of all monthly samples for last 12 months
- Whether MRDL was exceeded

Systems that use Chlorine Dioxide

Systems using chlorine dioxide required to sample quarterly or more frequently must report the following information to DEQ within 10 days after the end of each quarter in which samples were collected.

- Dates, results, locations of samples taken during the last quarter
- Whether MRDL was exceeded
- Whether MRDL was exceeded in any two consecutive daily samples and whether the violation was acute or non-acute

4.2 Disinfection By-Products (DBP)

4.2.1 Maximum Contaminant Level

For systems that use chlorine or chloramines

- The MCL for Total Trihalomethanes (TTHM) is 0.080 mg/L
- The MCL for Five Haloacetic Acids (HAA5) is 0.060 mg/L

For systems that use ozone

- The MCL for bromate (plants that use ozone) 0.010 mg/L

For systems that use chlorine dioxide

- The MCL for chlorite (for plants that use chlorine dioxide) is 1.0 mg/L

4.2.2 Routine Monitoring Locations and Requirements

Monitoring requirements are based on the type of disinfectant used. Systems that use a combination of disinfectants must sample for the DBPs associated with each disinfectant used.

Systems that use Chlorine Dioxide

Sample for Chlorite daily at the entry point to the distribution system and take a 3-sample set monthly within the distribution system (near the first customer, average residence time, and maximum residence time). The system must take 3 samples the following day within the distribution system (also near the first customer, average residence time, and maximum residence time) if any daily sample exceeds the MCL.
**Systems that use Ozone**

Sample for Bromate monthly at the entry point to the distribution system.

**Systems that use Chlorine or Chloramines**

Sample for TTHM and HAA5 within the distribution system. The number of sampling sites and sampling frequency is set forth in the following two tables. The first table lists the requirements under Stage 1 DBPR, and the second table lists the new requirements that will go into effect under the Stage 2 DBPR.

The specific site locations are based on the sampling plan prepared in accordance with the Stage 1 DBPR until the Stage 2 DBPR goes into effect, and then the Stage 2 sampling plan will be used.

Under the Stage 2 DBPR, a dual sample set (one TTHM sample and one HAA5 sample) must be taken at each site except as noted in the table below.

<table>
<thead>
<tr>
<th>Source Water Type</th>
<th>Population</th>
<th>Monitoring Locations</th>
<th>Monitoring Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface and GWUDISW</td>
<td>≥ 10,000</td>
<td>4 per treatment plant</td>
<td>Quarterly</td>
</tr>
<tr>
<td></td>
<td>500-9,999</td>
<td>1 per treatment plant</td>
<td>Quarterly</td>
</tr>
<tr>
<td></td>
<td>&lt; 500</td>
<td>1 per treatment plant</td>
<td>Annually *</td>
</tr>
<tr>
<td>Ground water</td>
<td>≥ 10,000</td>
<td>1 per treatment plant</td>
<td>Quarterly</td>
</tr>
<tr>
<td></td>
<td>&lt; 10,000</td>
<td>1 per treatment plant</td>
<td>Annually *</td>
</tr>
</tbody>
</table>

* Sample during month of warmest water temperature. If an MCL is exceeded, increase to quarterly
3.2.3 Reduced Monitoring

**Reduced monitoring requirements for systems using Chlorine Dioxide or Ozone**

Systems that use chlorine dioxide can reduce chlorite monitoring in the distribution system from monthly to quarterly if no daily sample has exceeded the MCL, no additional monitoring has been required, and no quarterly sample has exceeded the MCL.

Systems that use ozone can reduce bromate sampling based on bromide source sampling until the Stage 2 rule is in effect when reduced monitoring based on bromate levels is allowed.

**Reduced TTHM and HAA5 monitoring requirements under Stage 1 DBPR**

Systems monitoring TTHM and HAA5 can reduce monitoring (either from quarterly to annual and/or from 4/plant to 1/plant) if annual average DBP levels are less than or equal to one-half of the MCL and for surface water systems, if the source water TOC (total organic carbon) is less than or equal to 4.0 mg/L.

Ground water systems on annual TTHM and HAA5 monitoring can reduce to sampling every 3 years if the annual average DBP levels are less than or equal to one-half the MCL for 2 consecutive years or levels are less than or equal to one-fourth the MCL for one year.

---

### Table 4.3 Routine Monitoring Requirements for TTHM and HAA5 under Stage 2 DBPR

<table>
<thead>
<tr>
<th>Source Water Type</th>
<th>Population Size Category</th>
<th>Monitoring Locations</th>
<th>Monitoring Frequency $^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Surface</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GWUDISW Purchased Surface</td>
<td>&lt;500</td>
<td>2$^1$</td>
<td>Annually</td>
</tr>
<tr>
<td></td>
<td>500-3,300</td>
<td>2$^1$</td>
<td>Quarterly</td>
</tr>
<tr>
<td></td>
<td>3,301-9,999</td>
<td>2</td>
<td>Quarterly</td>
</tr>
<tr>
<td></td>
<td>10,000-49,999</td>
<td>4</td>
<td>Quarterly</td>
</tr>
<tr>
<td></td>
<td>50,000-249,999</td>
<td>8</td>
<td>Quarterly</td>
</tr>
<tr>
<td></td>
<td>250,000-999,999</td>
<td>12</td>
<td>Quarterly</td>
</tr>
<tr>
<td></td>
<td>1,000,000-4,999,999</td>
<td>16</td>
<td>Quarterly</td>
</tr>
<tr>
<td></td>
<td>&gt; 5,000,000</td>
<td>20</td>
<td>Quarterly</td>
</tr>
<tr>
<td><strong>Ground Water</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>&lt;500</td>
<td>2$^1$</td>
<td>Annually</td>
</tr>
<tr>
<td></td>
<td>500-9,999</td>
<td>2$^1$</td>
<td>Annually</td>
</tr>
<tr>
<td></td>
<td>10,000-99,999</td>
<td>4</td>
<td>Quarterly</td>
</tr>
<tr>
<td></td>
<td>100,000-499,999</td>
<td>6</td>
<td>Quarterly</td>
</tr>
<tr>
<td></td>
<td>&gt; 500,000</td>
<td>8</td>
<td>Quarterly</td>
</tr>
</tbody>
</table>

$^1$These systems may take individual TTHM and HAA5 samples (instead of a dual sample set) at the locations with the highest TTHM and HAA5 concentrations, respectively. If the highest TTHM and HAA5 concentrations occur at the same location (and month, if monitored annually) one location with a dual sample set is adequate.

$^2$Sampling must include the month of highest DBP concentrations.
Reduced TTHM and HAA5 monitoring requirements under Stage 2 DBPR

Reduced TTHM and HAA5 monitoring must be taken at the sites with highest TTHM and HAA5 samples – divided evenly between the two DBPs. Annual (or less frequent) monitoring must be conducted during the quarter with the highest single DBP values for TTHM and HAA5.

For systems that reduce to two single samples, one dual sample set is adequate if the highest TTHM and HAA5 measurements occurred at the same location and quarter.

<table>
<thead>
<tr>
<th>Table 4.4 TTHM and HAA5 Reduced Monitoring under Stage 2 DBPR</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Source</strong></td>
</tr>
<tr>
<td>-----------</td>
</tr>
<tr>
<td><strong>Surface</strong></td>
</tr>
<tr>
<td>GWUDISW</td>
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<td></td>
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<tr>
<td></td>
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<tr>
<td></td>
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<tr>
<td></td>
</tr>
<tr>
<td><strong>Ground Water</strong></td>
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</tr>
</tbody>
</table>

4.2.4 Increased Monitoring

**Increased Monitoring under Stage 1 DBPR**

If a system is on annual (or less frequent) monitoring and the annual average exceeds the MCL, sampling must be increased to quarterly. If a system is on any form of reduced monitoring, and the running annual average exceeds the MCL, the system must return to routine monitoring.

**Increased Monitoring Under Stage 2 DBPR**

Systems on an increased Stage 1 DBPR monitoring schedule must begin Stage 2 DBPR monitoring on the increased schedule until they meet the requirements for returning to the routine schedule.

If a system is on annual (or less frequent) monitoring and a TTHM or HAA5 sample exceeds the MCL at any location, the system must increase monitoring frequency to quarterly (taken every 90 days) at all locations.

A system may return to routine monitoring if the TTHM LRAA for every monitoring location is less than or equal to 0.060 mg/L and the HAA5 LRAA for every monitoring location is less than or equal to 0.045 mg/L after four or more quarters of increased monitoring.
4.2.5 **Operational Evaluations**

The Stage 2 DBPR will require systems to determine if they have exceeded an Operational Evaluation Level (OEL), which is identified using their compliance monitoring results. After each quarter of sampling, the system will add the values from the previous two quarters to twice the value of the current quarter and divide by four.

\[
OEL = \frac{Q_1 + Q_2 + 2Q_3}{4}
\]

If this value is greater than the MCL, this is an exceedance of the operational evaluation level. It is not a violation, but an evaluation of what may have caused the high DBP levels is required. This provides an early warning of a possible future MCL violation and allows the system to take **proactive** steps to remain in compliance.

4.2.6 **Violations**

**Monitoring Violations**

Monitoring violations for disinfection by-products require Tier 3 public notice.

**MCL Violation for systems using chlorine or chlorine dioxide**

TTHM and HAA5 MCL violations are based on a system-wide running annual average of quarterly samples. Stage 2 DBPR compliance is based on a “locational running annual average.” Compliance will be calculated for each monitoring location in the distribution system. MCL violations for TTHM and HAAS require Tier 2 public notice.

**MCL Violations for systems using ozone**

Bromate MCL violations are based on a running annual average of monthly samples computed quarterly. MCL violations for bromate require Tier 2 public notice.

**MCL Violations for systems using chlorine dioxide**

Chlorite MCL violations are based on an average of the three additional samples taken after the daily sample that was over the MRDL. MCL violations for using chlorine dioxide require Tier 2 public notice.

4.2.7 **Reporting**

Systems required to sample DBPs quarterly or more frequently must report the following information to DEQ within 10 days after the end of each quarter in which samples were collected.

- Number of samples taken during last quarter (or year if on annual)
- Location, date and result of each sample taken during last quarter (or year if on annual)
- Average of all samples taken in last quarter (or year if on annual)
- Annual average of all quarterly averages for last 4 quarters (if on quarterly)
- Whether the MCL was exceeded

Systems required to sample less frequently must report the following within 10 days after the end of each monitoring period in which samples were collected.

- Location, date and result of last sample taken
- Whether the MCL was exceeded
5. FLUORIDE ADDITION

Some public water systems choose to add fluoride to the drinking water for the dental benefits it can provide. However, high levels of fluoride can have negative public health impacts, causing staining and pitting of teeth.

The levels and monitoring for fluoride added to water is set by state regulation ARM 17.38.230. There is no associated federal regulation.

For naturally occurring fluoride, compliance with the MCL of 4.0 mg/L and the secondary MCL of 2.0 are discussed in Section 3.2.

5.1.1 Maximum Level

Systems that add fluoride to their finished water for the dental benefits must meet the maximum level of 1.5 mg/L in the finished water.

5.1.2 Routine Monitoring

Systems that add fluoride to their water supply shall sample daily and analyze at a point after fluoridation. The sample analysis must use a control range from 0.9 mg/L lower limits to 1.5 mg/L upper limits.

Each month one sample of treated water must be submitted to DEQ laboratory for analysis.

5.1.3 Violations

Failure to sample or submit a sample to DEQ, is considered a Tier 3 violation.

5.1.4 Reporting

The system shall keep records of the analyses on file and forward a copy to DEQ monthly.
6. CONSECUTIVE PUBLIC WATER SYSTEMS

A consecutive system is a public water system that buys or otherwise receives some or all of its finished water from one or more wholesale system(s). Consecutive systems are subject to the same Safe Drinking Water Act regulations as other public water systems. The regulations that consecutive systems must comply with are system specific and depend on the type of source water.

6.1.1 Monitoring Requirements

Public systems that purchase some of their water but also have their own source are required to comply with the all applicable regulations. However, systems that purchase all of their water and do not have a source of their own are not required to comply with regulations associated with source quality. These systems are only required to comply with the following regulations:

- Total Coliform Rule (see Section 2.1)
- Ground Water Rule – Systems that purchase ground water, must notify the wholesale system in the event of a total coliform positive sample (see Section 2.2.4)
- Disinfectants/Disinfection By-Products Rule – systems that add a chemical disinfectant or provide water that has been disinfected (see Section 4)
- Lead and Copper Rule (see Section 3.4)
- Disinfectant residual monitoring for consecutive connection systems connected to surface water systems or when the department requires the consecutive connection to maintain a residual.

6.1.2 Notification Requirements

Consecutive systems are required to follow the Public Notification Rule and Consumer Confidence Rule. Consecutive systems that purchase ground water are required to notify their wholesale system, in addition to public notification requirements, in the event of a total coliform positive sample.
7. PUBLIC NOTIFICATION REQUIREMENTS

The Public Notification Rule requires systems to notify customers concerning water quality violations or situations. Problems can and do occur within the water system despite the efforts of water suppliers. When a drinking water compliance issue arises, the people who drink the water have a right to know what happened and what they need to do. The public notice requirements of the Safe Drinking Water Act require water suppliers to provide this notice.

Public notification of drinking water violations and other situations provides an opportunity to educate the public, protect public health, build trust with consumers through open and honest sharing of information, and establish an ongoing, positive relationship with your community. The greater the effort your water system makes to reach and inform everyone in your service area, the more they will trust your commitment to delivering safe water and protecting public health.

EPA published the final Public Notification Regulation in 2000 to revise the general public notification regulations within the regulations in place. The State adopted the federal regulations by reference under ARM 17.38.239. The federal reference is 40 CFR 141.201-211.

7.1 What violations and situations require public notice?

In general, public notice is required for any of the following violations:

- Exceedances of maximum contaminant levels (MCLs) or maximum residual disinfectant levels (MRDLs);
- Violation of treatment techniques;
- Monitoring and testing procedure violations; and
- Failure to comply with the schedule of a variance or exemption.

Other situations (not violations) which require notice include:

- Occurrence of a waterborne disease outbreak or other waterborne emergency;
- Fecal indicator-positive source water samples
- Exceedance of the secondary maximum contaminant level for fluoride;
- Availability of unregulated contaminant monitoring results; and
- Operation under a variance or exemption;
- Special notice for uncorrected significant deficiencies under GWR

PNiWriter

EPA has created a web based tool to help water systems create public notices by answering questions and filling in blanks based on the system’s violation or situation. The PNiWriter is free and available at: http://www.pniwriter.org
7.2 Notification Tiers

7.2.1 Tier 1 Notice – Acute Health Effects

Tier 1 notices are required for violations and situations with significant potential to have serious adverse effects on human health as a result of short-term exposure. Within 24 hours of learning of the violation or situation, the system must issue public notice and initiate consultation with DEQ.

Microbial

- Acute violation of the MCL for total coliform, or failure to test for fecal coliform or E. coli when any sample tests positive for coliform;
- Fecal indicator-positive source sample taken in compliance with the Ground Water Rule;
- Violation of the treatment technique requirement resulting from a single exceedance of the maximum allowable turbidity limit, under the Surface Water Treatment Rules, Interim Enhanced Surface Water Treatment Rule or Long Term 1 Enhanced Surface Water Treatment Rule where DEQ determines after consultation that a Tier 1 notice is required or where consultation does not take place within 24 hours after the system learns of the violation;
- Occurrence of a waterborne disease outbreak, as defined in 40 CFR 141.2; and

Chemical and Other

- Violation of the MCL for nitrate, nitrite, or total nitrate and nitrite; or when a confirmation sample is not taken within 24 hours of the system’s receipt of the first sample showing exceedance of the nitrate or nitrite MCL;
- Violations of the MRDL for chlorine dioxide when one or more of the samples taken in the distribution system on the day after exceeding the MRDL at the entrance of the distribution system or when required samples are not taken in the distribution system;
- Occurrence of a waterborne emergency (such as a failure or significant interruption in key water treatment processes, a natural disaster that disrupts the water supply or distribution system, or a chemical spill or unexpected loading of possible pathogens into the source water that significantly increases the potential for drinking water contamination); and
- Other violations or situations with significant potential for serious adverse effects on human health as a result of short term exposure, as determined by DEQ either in its regulations or on a case-by-case basis.

7.2.2 Tier 2 Notice – Non-acute Health Effects

Tier 2 notices are required for violations and situations with significant potential to have serious adverse effects on human health. The water system must notify its customers as soon as possible but within 30 days of the violation.

- All violations of the MCL, MRDL, and treatment technique requirements except where Tier 1 notice is required;
- Violations of monitoring requirements where DEQ determines that a Tier 2 public notice is required, taking into account potential health impacts and persistence of the violation; and
- Failure to comply with the terms and conditions of any variance or exemption in place.

7.2.3 Tier 3 Notice – Monitoring Violations and Other Situations

Tier 3 notices are required for all other violations and situations not included in Tier 1 and Tier 2. The system has up to one year to provide a notice to its customers. Community systems may be able to consolidate these notices and send them with their Consumer Confidence Reports (CCR) if the report will be sent within 1 year of the violation or situation.
• Monitoring violations, except where Tier 1 notice is required or DEQ determines that the violation requires a Tier 2 notice;
• Failure to comply with an established testing procedure, except where Tier 1 notice is required or DEQ determines that the violation requires a Tier 2 notice;
• Operation under a variance granted under §1415 or exemption granted under §1416 of the Safe Drinking Water Act;
• Availability of unregulated contaminant monitoring results; and
• Exceedance of the fluoride secondary MCL as required under §141.208.
• Special notices associated with Cryptosporidium sampling and failure to report bin classification or mean Cryptosporidium level under the LT2ESWTR (Long Term 2 Enhanced Surface Water Treatment Rule)
• Special notice of any uncorrected significant deficiency under the Ground Water Rule (community systems may add to CCR, noncommunity systems must provide special notice within 12 months)

7.3 Timing and Delivery Methods for Public Notification

<table>
<thead>
<tr>
<th>Notification Tier</th>
<th>Deadline for Initial Notice</th>
<th>Repeat Notices</th>
<th>Delivery Methods¹</th>
</tr>
</thead>
</table>
| 1                 | As soon as practical, but no more than 24 hours (DEQ must also be contacted within 24 hours) | As directed by the state | • All Systems:  
• Broadcast media (radio or television), hand delivery, posting² or another method approved by DEQ |
| 2                 | As soon as practical, but no more than 30 days³ | Every 3 months | Community:  
• Mail or hand delivery  
• Second delivery method⁴ |
|                   |                             |                | NTNC:  
• Posting, hand delivery, or mail  
• Second delivery method⁴ |
| 3                 | 1 year                      | Annually       | Community:  
• Mail or hand delivery (public notice delivery may be provided by CCR if one year requirement is met.)  
• Second delivery method⁴ |
|                   |                             |                | NCWS:  
• Posting², hand delivery, or mail  
• Second delivery method⁴ |

¹Systems must use the methods listed unless directed otherwise by the DEQ in writing.
²Posted notices must remain up for as long as the violation or situation exists, but in no case less than 7 days.
³Extensions may be granted by the DEQ in writing allowing up to 3 months to give notice
⁴Provide a second delivery method as needed to reach consumers not likely to receive the primary notice.
7.4 Presentation

Each public notice must be displayed in a conspicuous manner when printed or posted. However, notices must not contain overly technical language, be formatted in a way that defeats the purpose of the notice, or contain language that nullifies the purpose of the notice.

7.5 State Notification

Within 10 days of completing public notice, the system must submit to DEQ a certification that public notice was completed and include a copy of all notices delivered.

7.6 Required Contents

Public notice of violations and situations must include specific information in order to be considered complete.

7.6.1 10 Required Elements

For each violation and situation requiring notice (other than special notice discussed below), the following must be provided in a clear and easy-to-understand manner:

1. The violation or situation, including the contaminant(s) of concern, and (as applicable) the contaminant level(s);
2. When the violation or situation occurred;
3. Any potential adverse health effects from drinking the water, using mandatory language described in Chapter 3;
4. The population at risk, including subpopulations that may be particularly vulnerable if exposed to the contaminant in their drinking water;
5. Whether alternate water supplies should be used;
6. Actions consumers should take, including when they should seek medical help, if known;
7. What you are doing to correct the violation or situation;
8. When you expect to return to compliance or resolve the situation;
9. Your name, business address, and phone number or those of a designee of the public water system as a source of additional information concerning the notice; and
10. A statement encouraging notice recipients to distribute the notice to others, where applicable, using the standard language provided below.

Although each of these elements must be included in the notice, the system has discretion as to how each element is addressed.

For instance, there is a wide range of information that may be included for the “action consumers should take” section. For microbial issues, the consumers may be told to boil water or drink bottled water. For inorganic contaminants, the notice may point out that boiling is not necessary (and will actually concentrate any contaminants). In some situations the response to this element may simply be that consumers do not need to take any action.

If you are not certain as to what actions consumers should take to protect their health, DEQ or a local health department should be contacted for the appropriate information. The local health department can also help identify other system-specific information, such as vulnerable populations (e.g., children, dialysis patients) and effective communication channels for reaching them.
7.6.2 Content of Special Notices

For special notices, the 10 required elements are not necessarily required. The required information associated with these notices is listed below.

**Exceedance of the fluoride SMCL**

The following language must be included in a special notice for exceedance of the SMLC for fluoride:

“This is an alert... This is an alert about your drinking water and a cosmetic dental problem that might affect children under nine years of age. At low levels, fluoride can help prevent cavities, but children drinking water containing more than 2 milligrams per liter (mg/l) of fluoride may develop cosmetic discoloration of their permanent teeth (dental fluorosis). The drinking water provided by your community water system [name] has a fluoride concentration of [insert value] mg/l.

Dental fluorosis in its moderate or severe forms, may result in a brown staining and or pitting of the permanent teeth. This problem occurs only in developing teeth, before they erupt from the gums. Children under nine should be provided with alternative sources of drinking water or water that has been treated to remove the fluoride to avoid the possibility of staining and pitting of their permanent teeth. You may also want to contact your dentist about proper use by young children of fluoride-containing products. Older children and adults may safely drink the water.

Drinking water containing more than 4 mg/l of fluoride (the U.S. Environmental Protection Agency’s drinking water standard) can increase your risk of developing bone disease. Your drinking water does not contain more than 4 mg/l of fluoride, but we’re required to notify you when we discover that the fluoride levels in your drinking water exceed 2 mg/l because of this cosmetic dental problem.

**Information to alert consumers of the availability of the unregulated contaminant monitoring results**

Systems required to conduct unregulated contaminant monitoring must let their customers know that this data is available no later than 12 months from when the data becomes available.

**Information about variances and exemptions**

If a system has been granted a variance or exemption, the notice must include an explanation of the reasons for the variance or exemption, the date it was issued, a brief status report on the steps the system is taking to address the situation, and a notice of opportunity for public input on the review of the variance or exemption.

**Uncorrected significant deficiency under ground water rule**

If DEQ has identified a significant deficiency at a ground water system and the system has not corrected it within 12 months, the system must provide notice that includes a description of the deficiency, when it was identified by DEQ, the state-approve corrective action, the schedule for corrective action. In addition, if the system serves a large proportion of non English speaking consumers, the public notice must contain the standard language discussed in the next section.

**Monitoring waivers**

If DEQ has granted a system any kind of waiver or exemption in monitoring, that system must inform the public it serves within 12 months. It should be included in the annual notice or the CCR as well.

7.6.3 Other Required Standard Language

**Health effects language**

For MCL and MRDL violations, treatment technique violations, and violations of the conditions of a variance or exemption, the notice must include language describing health effects associated with the contaminant. For most contaminants, the required language is provided in Appendix C.
**Language to encourage the widest possible distribution of the notice to all persons served.**

The following language must be included in all notices.

"Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail."

**Information for Non English Speaking Consumers**

For a system serving a large proportion of non English speaking consumers, the public notice must contain:

Information in the appropriate language(s) regarding the importance of the notice, or

A phone number or address where persons served may contact the water system to obtain a translated copy of the notice or to request assistance in the appropriate language

**Language for monitoring violations (including testing procedure violations).**

The following language must be included for all monitoring and testing procedure violations:

"We are required to monitor your drinking water for specific contaminants on a regular basis. Results of regular monitoring are an indicator of whether or not your drinking water meets health standards. During [compliance period], we [’did not monitor or test’ or ’did not complete all monitoring or testing’] for [contaminant(s)], and therefore cannot be sure of the quality of your drinking water during that time."
8. CONSUMER CONFIDENCE REPORT

The Consumer Confidence Reports Rule requires systems to provide consumers with an annual water quality report. The CCR summarizes information regarding sources used (i.e., rivers, lakes, reservoirs, or aquifers), any detected contaminants, and compliance and educational information. This information may help consumers determine if there may be impacts to their health.


8.1 Delivery Requirements

The following is a list of distribution requirements:

Systems serving 10,000 or more people:

- Mail a copy of the report to each customer
- Make a good faith effort to reach those customers who don’t get water bills, such as renters.
  This may include:
    - Posting on internet
    - Advertising availability in the newspaper
    - Publishing in the local newspaper
    - Posting in a public place
    - Delivering multiple copies to single bill addresses that have several people (e.g., apartment complex, etc.)
    - Delivering to community organizations
- Provide a copy of the CCR to anyone who requests one or is identified by DEQ.
- Systems serving over 100,000 must post their CCR on the internet.

Systems serving between 500 and 10,000 people:

- Publish the report in at least one local newspaper
- Notify their customers where they can get a copy
- Provide copies to anyone who requests one.

Systems serving less than 500 people:

- Provide notice at least once per year by mail, door-to-door delivery, or by posting in an appropriate location that the report is available upon request
- Provide copies to anyone who requests it.
8.2 Report Contents

<table>
<thead>
<tr>
<th>Table 8.1 Contents of the Report</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water System Information</td>
</tr>
<tr>
<td>• Name/phone number of contact person</td>
</tr>
<tr>
<td>• Information on public participation opportunities</td>
</tr>
<tr>
<td>• Information for non-English speaking populations; if applicable</td>
</tr>
<tr>
<td>Sources of Water</td>
</tr>
<tr>
<td>• Type and name of water sources (ex. Ground water, Clarks Fork valley aquifer)</td>
</tr>
<tr>
<td>• Availability of source water assessments</td>
</tr>
<tr>
<td>• Information on significant sources of contamination, if available</td>
</tr>
<tr>
<td>Definitions: MCL, MCLG, and, if applicable, Treatment Technique (TT), Action Level, MRDLG, MRDL, Variances and/or Exemptions</td>
</tr>
<tr>
<td>Detected Contaminants (Main Contaminant Table) - Summarize data on detected contaminants.</td>
</tr>
<tr>
<td>• For regulated contaminants include MCLs, MCLGs, TT, action level or MRDL and list the year the sample was taken (if other than current year)</td>
</tr>
<tr>
<td>• Range of levels found</td>
</tr>
<tr>
<td>• Known or likely source of each detected contaminant</td>
</tr>
<tr>
<td>• Highest contaminant levels used to report compliance (except for turbidity and total coliforms):</td>
</tr>
<tr>
<td>o Annually or less frequent monitoring - use highest value and note that results are from most recent required sample.</td>
</tr>
<tr>
<td>o Running system average - use average value</td>
</tr>
<tr>
<td>o Running locational average - use highest location</td>
</tr>
<tr>
<td>• For turbidity</td>
</tr>
<tr>
<td>o Systems that filter report the highest single measurement and lowest monthly percentage of samples meeting the combined filter effluent limit.</td>
</tr>
<tr>
<td>o Systems that do not filter report the highest monthly value.</td>
</tr>
<tr>
<td>• For TCR</td>
</tr>
<tr>
<td>o Highest number of monthly positive total coliform samples if system takes less than 40 samples per month.</td>
</tr>
<tr>
<td>o Highest percent of monthly positive total coliform samples if system takes 40 or more samples per month.</td>
</tr>
<tr>
<td>o The number of fecal positive samples during the year.</td>
</tr>
<tr>
<td>• For lead and copper, report most recent 90th percentile and the number of samples that exceeded the action level.</td>
</tr>
<tr>
<td>• For MCL, MRDL, or TT violations include health effects language, an explanation of the violation, length of the violation, and actions taken by the system toward correcting the violation</td>
</tr>
<tr>
<td>• Information on Cryptosporidium, radon, and detected but unregulated contaminants that may be considered potentially harmful, if applicable</td>
</tr>
</tbody>
</table>
Table 8.1 Contents of the Report (Continued)

Other Information to include in the report

- Report all other violations of the National Primary Drinking Water Regulations occurring during the year covered by the report and include an explanation of the violation, any potential adverse health effects and the steps the system has taken to correct the violation
- Explanation of contaminants that are reasonably expected to be found in the drinking water
- Warning for vulnerable populations that includes information about Cryptosporidium
- Informational statement for lead – required for all systems regardless of monitoring results.
- Informational statement for arsenic if levels were greater than 5 ppb but less than or equal to 10 ppb.
- Informational statement for nitrate if levels were greater than 5 ppm but less than 10 ppm.
- For any fecal indicator-positive source sample taken in compliance with the Ground water Rule, special notice in the report must include the source of contamination (if known), the date of the samples, whether the contamination has been addressed and the potential health effects language specified in the rule.
- If DEQ has identified a significant deficiency and the system has not corrected it by the end of that calendar year, the system must provide notice that includes a description of the deficiency, when it was identified by DEQ, the state-approve corrective action, the schedule for corrective action.

8.3 Deadlines

The following table provides information pertaining to the dates in which the report or information pertaining to the report are due.

Table 8.2 Report Deadlines

<table>
<thead>
<tr>
<th>ANNUAL DUE DATE</th>
<th>REQUIREMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>April 1</td>
<td>Deadline for community systems that sell water to another community system to deliver the information necessary for the purchasing system to prepare their CCR.</td>
</tr>
<tr>
<td>July 1</td>
<td>Deadline for annual distribution of CCR to customers and to DEQ for the previous calendar year.</td>
</tr>
<tr>
<td>October 1</td>
<td>Deadline for annual submissions of proof of distribution to DEQ. (or 3 months after distribution of CCR to customers and DEQ)</td>
</tr>
</tbody>
</table>

More detailed information about this rule can be obtained either by viewing the EPA website at www.epa.gov/safewater/ccr1.html or by contacting the DEQ Consumer Confidence Report Rule manager at 444-4400.

CCRiWriter

EPA has created a web based tool to help water systems create their annual CCRs by answering required questions and filling in blanks. The CCRiWriter is free and available at: http://ccriwriter.com
9. OTHER

9.1 Recordkeeping

Systems are required to keep test analyses results, public notice, and other records on file. Keeping the documents can be helpful in noticing system patterns and may be used to clear up any inconsistencies between records held elsewhere.

State regulations regarding recordkeeping can be found in ARM 17.38.234. The federal reference is 40 CFR 141.31-35.

The following table is a general outline of records public water systems are required to keep and the length of time the records are required to be kept. Some of these requirements may not apply if your system purchases its drinking water and adds no additional treatment.

<table>
<thead>
<tr>
<th>Table 9.1 Recordkeeping for Public Water Systems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Records</td>
</tr>
<tr>
<td>- Corrective Action for Violations</td>
</tr>
<tr>
<td>- Public Notices</td>
</tr>
<tr>
<td>- Consumer Confidence Reports (Community systems only)</td>
</tr>
<tr>
<td>- Microbiological analyses</td>
</tr>
<tr>
<td>- Turbidity analyses</td>
</tr>
<tr>
<td>- Variances or exemptions</td>
</tr>
<tr>
<td>- Chemical analyses</td>
</tr>
<tr>
<td>- Sanitary surveys and written reports</td>
</tr>
<tr>
<td>- Stage 1 and Stage 2 monitoring plans</td>
</tr>
<tr>
<td>- Records of all lead and copper results, WQP results, source water sampling results, corrosion control recommendations and studies, public education materials, state determinations, schedules, letters, evaluations</td>
</tr>
</tbody>
</table>

9.2 Sanitary Surveys

The state is required to conduct sanitary surveys of public water systems as regulated under ARM 17.38.231. The purpose of this survey is to help the system to stay in compliance with regulatory requirements as well as to provide technical assistance with operation and maintenance of the system. The surveys are completed by DEQ, or a DEQ representative, at no cost to the system. System operators must provide any necessary assistance to DEQ, or DEQ’s representative, in conducting the survey.

DEQ conducts a sanitary survey of each public water system on a periodic basis. Community systems are visited every 3 years and noncommunity systems are visited on a 5-year schedule. The survey consists of an on-site review of eight key elements of a water system:

- Source
- Treatment
- Distribution system
- Finished water storage
- Pumps, pump facilities, pump controls
- Monitoring, reporting and data verification
- System management and operation
- Operator compliance with state requirements
Upon completion of the survey, the site visitor will write a report and provide a copy to the system. The report will discuss the system’s condition as well as any deficiencies that should be addressed.

**Significant Deficiencies**

Under the Ground Water Rule, effective December 1, 2009, any significant deficiency identified by DEQ must be corrected, or the system must have a state-approved plan for correction, within 120 days of being notified of the deficiency. Failure to take action is a treatment technique violation and requires Tier 2 public notice.

Uncorrected significant deficiencies must also be addressed by a special notice. Noncommunity systems must provide the special notice annually. Community systems can incorporate the notice in their consumer confidence report.

### 9.3 Operator Certification

State regulation ARM 37.42.101 requires that persons responsible for the operation and maintenance of a community public water system become certified (licensed) as a system operator. To become a licensed operator, a person must:

- Submit an application at least 30 days prior to taking the exam,
- Pay the appropriate fees,
  - $70 for Water Distribution and/or Water Treatment (annual-non refundable)
  - $70 for Each Exam (2A3B, 3A4B, 4AB, 5AB considered one exam)
- Satisfactorily complete an examination concerning water system principles and practices, and
- Fulfill the necessary education/experiences requirement for the appropriate certification class.

#### 9.3.1 Certification Classes

There are two types of water system operator certifications in the State of Montana: Distribution System and Treatment. Distribution system certifications are classified by population served. Treatment certifications are classified by the complexity of treatment system and the population served. The following table summarizes the certification classes and the experience requirement for each class.

<table>
<thead>
<tr>
<th>Certification Classes</th>
<th>I First Class</th>
<th>II Second Class</th>
<th>III Third Class</th>
<th>IV Fourth Class</th>
<th>V Fifth Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Water Distribution Operator</td>
<td>Serving more than 20,000 people</td>
<td>Serving 2,500-20,000 people</td>
<td>Serving 500-2,499 people</td>
<td>Serving 100-499 people</td>
<td>Serving fewer than 100 people</td>
</tr>
<tr>
<td>B. Water System Operator</td>
<td>Treatment for surface water utilizing chemical coagulation, filtration, and disinfection</td>
<td>Treatment for surface water not utilizing chemical coagulation</td>
<td>Well water supply serving greater than 2,500 people, with or without disinfection</td>
<td>Well water supply serving 100-2,500 people, with or without disinfection</td>
<td>Well water supply serving fewer than 100 people, with or without disinfection</td>
</tr>
<tr>
<td>Experience Requirement for Fully Certified Operator</td>
<td>2 years</td>
<td>1 1/2 years</td>
<td>1 year</td>
<td>6 months</td>
<td>3 months as of 11/19/02</td>
</tr>
</tbody>
</table>

^1When an accurate population census is not available, the population served may be determined by multiplying the number of service connections by 2.5.
9.3.2 Operator Responsibilities

The operator’s responsibility is to assure drinking water is in adequate supply and that it is safe for the public to consume by complying with DEQ’s drinking water regulations. At the same time, the operator is responsible for assuring wastewater discharges does not endanger state waters. There are numerous activities that go along with these responsibilities.

Here is a list of some of those responsibilities:

- Sampling and/or monitoring to meet requirements.
- Keeping monitoring and other records
- Being readily available to:
  - act on sampling, monitoring and reporting to regulatory agencies;
  - respond to system inspections, system users or DEQ personnel;
  - react to system malfunctions.
- Issuing notice to users when the systems are not in compliance and there is a health risk.
- Protecting, maintaining and/or operating equipment purchased at public or user expense to provide safe drinking water in adequate supply or process safe effluent.
- Keeping records on the system maintenance program
- Calculating and making chemical applications or removals in order to protect public health or state waters or parts of the system.
- Understanding and preventing what may endanger a safe drinking water supply or wastewater effluent or equipment used to do the same.
- Assuring that newly installed or repaired equipment or systems meet requirements adopted to protect the public health and environment.
- Notifying the DEQ of the termination of your responsibilities to a system and advising your replacement that he/she requires certification.

9.3.3 Certification Renewal

Operators must renew their certification annually (by June 30) for the following fiscal year (July 1-June 30). Renewal includes a fee payment annually and proof of completion of the appropriate continuing education credits (CEC) requirements every two years (on even numbered years).

9.3.4 CEC Requirement for Fully Certified Operators:

<table>
<thead>
<tr>
<th>Class</th>
<th>CEC Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class 1 water operators</td>
<td>2.0 CECs (20 hours) per certification</td>
</tr>
<tr>
<td>Class 2, 3 or 4 water operators</td>
<td>1.0 CECs (10 hours) per certification</td>
</tr>
<tr>
<td>Class 5 water operators</td>
<td>0.4 CECs (4 hours) per certification</td>
</tr>
</tbody>
</table>

For more information regarding these requirements, please contact the Certification Office at 406-444-3434, 406-444-4584 or visit the website at [http://www.deq.state.mt.us/wqinfo/opcert/index.mcpx](http://www.deq.state.mt.us/wqinfo/opcert/index.mcpx)
9.4 Water System Improvements

In accordance with ARM 17.38.101, the construction, alteration, extension or operation of a public water system must be approved by DEQ. Design of a community public water supply system must be prepared and designed by a licensed professional engineer in accordance with DEQ-1. Design of a non-transient noncommunity system must be in accordance with DEQ-3, and requires a licensed professional engineer when the complexity of the system warrants this level of expertise.

All plans and specifications for such improvements must be reviewed and approved by the DEQ Public Water Supply Section prior to construction. The design of a new community water systems requires the applicant to address technical, managerial, operational, maintenance and financial capacity in accordance with Appendix A in DEQ-1.

Any new ground water source must be evaluated for ground water under the direct influence of surface water (PWS-5). All new sources must be properly assessed and located in accordance with PWS-6.

Fees will be assessed for these reviews in accordance with the fee schedule.

9.5 Service Connection Fees

All public water suppliers pay an annual fee to the Public Water Supply and Subdivisions Bureau to help fund technical assistance and required compliance inspections. Fees are based on system classification and number of connections. The annual fee must be postmarked or delivered to DEQ no later than March 1 of each year.

The annual fee for community water systems is based on the number of service connections. Each water system shall determine the total number of active service connections for each fiscal year based on an assessment that occurs between July 1 and August 1 of that fiscal year. For the purpose of calculating the fee, a service connection has the following requirements:

- the connection was turned on for some portion of the fiscal year
- payment is required for the water services
- the connection supplies water for human consumption (not exclusively for livestock or fire protection)
APPENDIX A - TOTAL COLIFORM SAMPLE SITE PLAN GUIDELINES

A coliform sample site plan must be prepared by the owner and sampled in accordance with the Total Coliform Rule. To ensure samples are representative, routine sample sites shall be evenly spaced throughout the area of the distribution system. Routine sample sites shall be selected to sample water in the distribution system from each water source, storage tank, reservoir, and pressure zone. Sample sites must be rotated each time a routine sample is collected.

Plans are subject to State DEQ review and revision. The sample site plans shall be submitted to the department within 30 days of system startup date. The sample site plan will be placed in the department’s files and reviewed during sanitary surveys and field inspections. The plan is also used by the department to help a system research a contamination problem.

At a minimum, the sample site plan should include:

- A map of the water distribution system showing the location of each routine sample site, water source, treatment facility, storage tank, reservoir, and the boundaries of each pressure zone. Each routine sample site shall be assigned a unique and permanent identification number, which shall be shown on the map.
- A description of the monthly sampling rotation cycle. The required number of monthly routine samples may be less than is necessary to cover all pressure zones and areas served by each source and reservoir. In such cases, sample locations should be rotated on a monthly basis. Systems are strongly encouraged to monitor each pressure zone at least once every three months.
- A location description, including the owner’s name, business name, and street address where available, for each routine sample site.

### Table A-1 Minimum Routine Sample Sites

<table>
<thead>
<tr>
<th>Service Connections</th>
<th>Sample Sites</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2 to 10</td>
<td>2</td>
</tr>
<tr>
<td>11 to 100</td>
<td>3</td>
</tr>
<tr>
<td>101 to 500</td>
<td>4</td>
</tr>
<tr>
<td>&gt;500</td>
<td>5</td>
</tr>
</tbody>
</table>

Sample Site Requirements:

- No routine sample sites may be the last service connection from a dead end of the water distribution system.
- Repeat sample sites shall be available within 5 service connections both upstream and downstream of each routine sample site, if possible. If the system does not have enough connections, then the repeat samples should be representative of the distribution system.
- Small systems may, if necessary, collect repeat samples at one or more of the other routine sample sites if they are located within five service connections of the original coliform positive routine sample site.

Recommendations for selection of sample sites:

- Inspect the plumbing to ensure there are no cross-connections with non-potable water sources
- Make sure the sampling tap is free of any aerators, strainers, hoses, or water treatment devices.
- Avoid leaking taps that allow water to flow to the outside of the tap.
- Routine sample sites shall be accessible daily, throughout the entire year.
- Do not sample after treatment processes such as softeners that are not maintained by the PWS, as these devices can harbor bacteria.
- No routine sample sites may be the last service connection from a dead end of the water distribution system.
- Repeat sample sites shall be available within 5 service connections both upstream and downstream of each routine sample site.
- Small systems may, if necessary, collect repeat samples at one or more of the other routine sample sites if they are located within five service connections of the original coliform positive routine sample site.
APPENDIX B - HOW TO TAKE A BACTERIOLOGICAL SAMPLE

Sample Collection and Procedure

Bacteriological samples are at risk to contamination and false positive results if not sampled properly. Proper sample collection is important to ensure bacteria does not contaminate the otherwise clean water.

The laboratory that supplies the sampling containers normally provides instruction with the sampling kit for the type of monitoring you are doing. Refer to those instructions when provided. The following instructions give a general sampling procedure for collecting coliform samples.

Collecting the Sample

1. Select a good faucet to sample from – not leaking, non-swivel, not a drinking fountain or outside hydrant.
2. Remove any faucet attachments – aeration screens, hoses, etc.
3. Flush the tap by opening it fully and letting the water run for 2 to 3 minutes
4. Reduce the flow to avoid splashing when collecting the sample
   - Adjust the flow to be about the diameter of a pencil
   - Avoid allowing the water to contact the metal rim of the faucet
5. Fill in the label on the bottle.
6. Remove the bottle cap
   - Do not touch the inside of the cap or bottle
   - Do not set the cap down anywhere
   - Keep the inside of the cap pointed down
7. Fill the bottle to the neck or fill line.
   - Do not touch the bottle to the faucet
   - Do not rinse out the bottle (the white powder neutralizes any chlorine in the water)
8. Replace the cap
9. If you think you have contaminated the sample or bottle, start over with a new bottle; it can save time and money.
### APPENDIX C - MAXIMUM CONTAMINANT LEVELS AND HEALTH EFFECTS LANGUAGE

<table>
<thead>
<tr>
<th>Contaminant (units)</th>
<th>Traditional MCL in mg/L</th>
<th>Major sources in drinking water</th>
<th>Health effects language</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Microbiological contaminants:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Coliform Bacteria</td>
<td>MCL: (systems that collect ( \geq 40 ) samples/month) ( 5% ) of monthly samples are positive; (systems that collect (&lt; 40 ) samples/month) ( 1 ) positive monthly sample; failure to take all repeat samples</td>
<td>Naturally present in the environment</td>
<td>Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other, potentially-harmful, bacteria may be present. Coliforms were found in more samples than allowed and this was a warning of potential problems.</td>
</tr>
<tr>
<td>Fecal coliform and E. coli</td>
<td>0</td>
<td>Human and animal fecal waste</td>
<td>Fecal coliforms and E. coli are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely-compromised immune systems.</td>
</tr>
<tr>
<td>Fecal Indicators (enterococci or coliphage)</td>
<td>TT</td>
<td>Human and animal fecal waste</td>
<td>Fecal indicators are microbes whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term health effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely compromised immune systems.</td>
</tr>
<tr>
<td>Total organic carbon (ppm)</td>
<td>TT</td>
<td>Naturally present in the environment</td>
<td>Total organic carbon (TOC) has no health effects. However, total organic carbon provides a medium for the formation of disinfection by products. These byproducts include trihalomethanes (THMs) and haloacetic acids (HAAs). Drinking water containing these byproducts in excess of the MCL may lead to adverse health effects, liver or kidney problems, or nervous system effects, and may lead to an increased risk of getting cancer.</td>
</tr>
<tr>
<td>Turbidity (NTU)</td>
<td>TT</td>
<td>Soil runoff</td>
<td>Turbidity has no health effects. However, turbidity can interfere with disinfection and provide a medium for microbial growth. Turbidity may indicate the presence of disease-causing organisms. These organisms include bacteria, viruses, and parasites that can cause symptoms such as nausea, cramps, diarrhea and associated headaches.</td>
</tr>
<tr>
<td>Beta/photon emitters (mrem/yr)</td>
<td>4 mrem/yr</td>
<td>Decay of natural and man-made deposits</td>
<td>Certain minerals are radioactive and may emit forms of radiation known as photons and beta radiation. Some people who drink water containing beta particle and photon radioactivity in excess of the MCL over many years may have an increased risk of getting cancer.</td>
</tr>
<tr>
<td>Alpha emitters (pCi/L)</td>
<td>15 pCi/L</td>
<td>Erosion of natural deposits</td>
<td>Certain minerals are radioactive and may emit a form of radiation known as alpha radiation. Some people who drink water containing alpha emitters in excess of the MCL over many years may have an increased risk of getting cancer.</td>
</tr>
<tr>
<td>Contaminant (units)</td>
<td>Traditional MCL in mg/L</td>
<td>Major sources in drinking water</td>
<td>Health effects language</td>
</tr>
<tr>
<td>---------------------</td>
<td>--------------------------</td>
<td>---------------------------------</td>
<td>-------------------------</td>
</tr>
<tr>
<td>Combined radium (pCi/L)</td>
<td>5 pCi/L</td>
<td>Erosion of natural deposits</td>
<td>Some people who drink water containing radium-226 or -228 in excess of the MCL over many years may have an increased risk of getting cancer.</td>
</tr>
<tr>
<td>Uranium (pCi/L)</td>
<td>30 µg/L</td>
<td>Erosion of natural deposits</td>
<td>Some people who drink water containing uranium in excess of the MCL over many years may have an increased risk of getting cancer and kidney toxicity.</td>
</tr>
<tr>
<td>Antimony (ppb)</td>
<td>.006</td>
<td>Discharge from petroleum refineries; fire retardants; ceramics; electronics; solder</td>
<td>Some people who drink water containing antimony well in excess of the MCL over many years could experience increases in blood cholesterol and decreases in blood sugar.</td>
</tr>
<tr>
<td>Arsenic (ppb)</td>
<td>.010</td>
<td>Erosion of natural deposits; Runoff from orchards; Runoff from glass and electronics production wastes</td>
<td>Some people who drink water containing arsenic in excess of the MCL over many years could experience skin damage or problems with their circulatory system, and may have an increased risk of getting cancer.</td>
</tr>
<tr>
<td>Asbestos (MFL)</td>
<td>7 MFL</td>
<td>Decay of asbestos cement water mains; Erosion of natural deposits</td>
<td>Some people who drink water containing asbestos in excess of the MCL over many years may have an increased risk of developing benign intestinal polyps.</td>
</tr>
<tr>
<td>Barium (ppm)</td>
<td>2</td>
<td>Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits</td>
<td>Some people who drink water containing barium in excess of the MCL over many years could experience an increase in their blood pressure.</td>
</tr>
<tr>
<td>Beryllium (ppb)</td>
<td>.004</td>
<td>Discharge from metal refineries and coal-burning factories; Discharge from electrical, aerospace, and defense industries</td>
<td>Some people who drink water containing beryllium well in excess of the MCL over many years could develop intestinal lesions.</td>
</tr>
<tr>
<td>Bromate (ppb)</td>
<td>.010</td>
<td>By-product of drinking water disinfection</td>
<td>Some people who drink water containing bromate in excess of the MCL over many years may have an increased risk of getting cancer.</td>
</tr>
<tr>
<td>Cadmium (ppb)</td>
<td>.005</td>
<td>Corrosion of galvanized pipes; Erosion of natural deposits; Discharge from metal refineries; Runoff from waste batteries and paints</td>
<td>Some people who drink water containing cadmium in excess of the MCL over many years could experience kidney damage.</td>
</tr>
<tr>
<td>Chloramines (ppm)</td>
<td>MRDL=4</td>
<td>Water additive used to control microbes</td>
<td>Some people who use water containing chloramines well in excess of the MRDL could experience irritating effects to their eyes and nose. Some people who drink water containing chloramines well in excess of the MRDL could experience stomach discomfort or anemia.</td>
</tr>
<tr>
<td>Chlorine (ppm)</td>
<td>MRDL=4</td>
<td>Water additive used to control microbes</td>
<td>Some people who use water containing chlorine well in excess of the MRDL could experience irritating effects to their eyes and nose. Some people who drink water containing chlorine well in excess of the MRDL could experience stomach discomfort.</td>
</tr>
<tr>
<td>Contaminant (units)</td>
<td>Traditional MCL in mg/L</td>
<td>Major sources in drinking water</td>
<td>Health effects language</td>
</tr>
<tr>
<td>----------------------------------</td>
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<td>-----------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Chlorine dioxide (ppb)</td>
<td>MRDL=.8</td>
<td>Water additive used to control microbes</td>
<td>Some infants and young children who drink water containing chlorine dioxide in excess of the MRDL could experience nervous system effects. Similar effects may occur in fetuses of pregnant women who drink water containing chlorine dioxide in excess of the MRDL. Some people may experience anemia.</td>
</tr>
<tr>
<td>Chlorite (ppm)</td>
<td>1</td>
<td>By-product of drinking water disinfection</td>
<td>Some infants and young children who drink water containing chlorite in excess of the MCL could experience nervous system effects. Similar effects may occur in fetuses of pregnant women who drink water containing chlorite in excess of the MCL. Some people may experience anemia.</td>
</tr>
<tr>
<td>Chromium (ppb)</td>
<td>.1</td>
<td>Discharge from steel and pulp mills; Erosion of natural deposits</td>
<td>Some people who use water containing chromium well in excess of the MCL over many years could experience allergic dermatitis.</td>
</tr>
<tr>
<td>Copper (ppm)</td>
<td>AL=1.3</td>
<td>Corrosion of household plumbing systems; Erosion of natural deposits</td>
<td>Copper is an essential nutrient, but some people who drink water containing copper in excess of the action level over a relatively short amount of time could experience gastrointestinal distress. Some people who drink water containing copper in excess of the action level over many years could suffer liver or kidney damage. People with Wilson's disease should consult their personal doctor.</td>
</tr>
<tr>
<td>Cyanide (ppb)</td>
<td>.2</td>
<td>Discharge from steel/metal factories; Discharge from plastic and fertilizer factories</td>
<td>Some people who drink water containing cyanide well in excess of the MCL over many years could experience nerve damage or problems with their thyroid.</td>
</tr>
<tr>
<td>Fluoride (ppm)</td>
<td>4</td>
<td>Erosion of natural deposits; Water additive which promotes strong teeth; Discharge from fertilizer and aluminum factories</td>
<td>Some people who drink water containing fluoride in excess of the MCL over many years could get bone disease, including pain and tenderness of the bones. Fluoride in drinking water at half the MCL or more may cause mottling of children's teeth, usually in children less than nine years old. Mottling, also known as dental fluorosis, may include brown staining and/or pitting of the teeth, and occurs only in developing teeth before they erupt from the gums.</td>
</tr>
<tr>
<td>Lead (ppb)</td>
<td>AL=.015</td>
<td>Corrosion of household plumbing systems; Erosion of natural deposits</td>
<td>Infants and children who drink water containing lead in excess of the action level could experience delays in their physical or mental development. Children could show slight deficits in attention span and learning abilities. Adults who drink this water over many years could develop kidney problems or high blood pressure.</td>
</tr>
<tr>
<td>Mercury [inorganic] (ppb)</td>
<td>.002</td>
<td>Erosion of natural deposits; Discharge from refineries and factories; Runoff from landfills; Runoff from cropland</td>
<td>Some people who drink water containing inorganic mercury well in excess of the MCL over many years could experience kidney damage.</td>
</tr>
<tr>
<td>Nitrate (ppm)</td>
<td>10</td>
<td>Runoff from fertilizer use; Leaching from septic tanks, sew age; Erosion of natural deposits</td>
<td>Infants below the age of six months who drink water containing nitrate in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue baby syndrome.</td>
</tr>
<tr>
<td>Nitrite (ppm)</td>
<td>1</td>
<td>Runoff from fertilizer use; Leaching from septic tanks, sew age; Erosion of natural deposits</td>
<td>Infants below the age of six months who drink water containing nitrite in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue baby syndrome.</td>
</tr>
<tr>
<td>Contaminant (units)</td>
<td>Traditional MCL in mg/L</td>
<td>Major sources in drinking water</td>
<td>Health effects language</td>
</tr>
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</tr>
<tr>
<td>Selenium (ppb)</td>
<td>.05</td>
<td>Discharge from petroleum and metal refineries; Erosion of natural deposits; Discharge from mines</td>
<td>Selenium is an essential nutrient. However, some people who drink water containing selenium in excess of the MCL over many years could experience hair or fingernail losses, numbness in fingers or toes, or problems with their circulation.</td>
</tr>
<tr>
<td>Thallium (ppb)</td>
<td>.002</td>
<td>Leaching from ore-processing sites; Discharge from electronics, glass, and drug factories</td>
<td>Some people who drink water containing thallium in excess of the MCL over many years could experience hair loss, changes in their blood, or problems with their kidneys, intestines, or liver.</td>
</tr>
<tr>
<td>2,4-D (ppb)</td>
<td>.07</td>
<td>Runoff from herbicide used on row crops</td>
<td>Some people who drink water containing the weed killer 2,4-D well in excess of the MCL over many years could experience problems with their kidneys, liver, or adrenal glands.</td>
</tr>
<tr>
<td>2,4,5-TP <a href="ppb">Silvex</a></td>
<td>.05</td>
<td>Residue of banned herbicide</td>
<td>Some people who drink water containing silvex in excess of the MCL over many years could experience liver problems.</td>
</tr>
<tr>
<td>Acrylamide</td>
<td>TT</td>
<td>Added to water during sewage/wastewater treatment</td>
<td>Some people who drink water containing high levels of acrylamide over a long period of time could have problems with their nervous system or blood, and may have an increased risk of getting cancer.</td>
</tr>
<tr>
<td>Alachlor (ppb)</td>
<td>.002</td>
<td>Runoff from herbicide used on row crops</td>
<td>Some people who drink water containing alachlor in excess of the MCL over many years could have problems with their eyes, liver, kidneys, or spleen, or experience anemia, and may have an increased risk of getting cancer.</td>
</tr>
<tr>
<td>Atrazine (ppb)</td>
<td>.003</td>
<td>Runoff from herbicide used on row crops</td>
<td>Some people who drink water containing atrazine well in excess of the MCL over many years could experience problems with their cardiovascular system or reproductive difficulties.</td>
</tr>
<tr>
<td>Benzo(a)pyrene [PAH] (nanograms/l)</td>
<td>.0002</td>
<td>Leaching from linings of water storage tanks and distribution lines</td>
<td>Some people who drink water containing benzo(a)pyrene in excess of the MCL over many years may experience reproductive difficulties and may have an increased risk of getting cancer.</td>
</tr>
<tr>
<td>Carbofuran (ppb)</td>
<td>.04</td>
<td>Leaching of soil fumigant used on rice and alfalfa</td>
<td>Some people who drink water containing carbofuran in excess of the MCL over many years could experience problems with their blood, or nervous or reproductive systems.</td>
</tr>
<tr>
<td>Chlordane (ppb)</td>
<td>.002</td>
<td>Residue of banned termiticide</td>
<td>Some people who drink water containing chlordane in excess of the MCL over many years could experience problems with their liver or nervous system, and may have an increased risk of getting cancer.</td>
</tr>
<tr>
<td>Dalapon (ppb)</td>
<td>.2</td>
<td>Runoff from herbicide used on rights of way</td>
<td>Some people who drink water containing dalapon well in excess of the MCL over many years could experience minor kidney changes.</td>
</tr>
<tr>
<td>Di(2-ethylhexyl) adipate (ppb)</td>
<td>.4</td>
<td>Discharge from chemical factories</td>
<td>Some people who drink water containing di(2-ethylhexyl) adipate well in excess of the MCL over many years could experience toxic effects such as weight loss, liver enlargement or possible reproductive difficulties.</td>
</tr>
<tr>
<td>Contaminant (units)</td>
<td>Traditional MCL in mg/L</td>
<td>Major sources in drinking water</td>
<td>Health effects language</td>
</tr>
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</tr>
<tr>
<td>Di(2-ethylhexyl) phthalate (ppb)</td>
<td>.006</td>
<td>Discharge from rubber and chemical factories</td>
<td>Some people who drink water containing di(2-ethylhexyl) phthalate well in excess of the MCL over many years may have problems with their liver, or experience reproductive difficulties, and may have an increased risk of getting cancer.</td>
</tr>
<tr>
<td>Dibromochloropropane (ppt)</td>
<td>.0002</td>
<td>Runoff/leaching from soil fumigant used on soybeans, cotton, pineapples, and orchards</td>
<td>Some people who drink water containing DBCP in excess of the MCL over many years could experience reproductive problems and may have an increased risk of getting cancer.</td>
</tr>
<tr>
<td>Dinoseb (ppb)</td>
<td>.007</td>
<td>Runoff from herbicide used on soybeans and vegetables</td>
<td>Some people who drink water containing dinoseb well in excess of the MCL over many years could experience reproductive difficulties.</td>
</tr>
<tr>
<td>Diquat (ppb)</td>
<td>.02</td>
<td>Runoff from herbicide use</td>
<td>Some people who drink water containing diquat in excess of the MCL over many years could get cataracts.</td>
</tr>
<tr>
<td>Dioxin [2,3,7,8-TCDD] (ppq)</td>
<td>.00000003</td>
<td>Emissions from waste incineration and other combustion; Discharge from chemical factories</td>
<td>Some people who drink water containing dioxin in excess of the MCL over many years could experience reproductive difficulties and may have an increased risk of getting cancer.</td>
</tr>
<tr>
<td>Endothall (ppb)</td>
<td>.1</td>
<td>Runoff from herbicide use</td>
<td>Some people who drink water containing endothall in excess of the MCL over many years could experience problems with their stomach or intestines.</td>
</tr>
<tr>
<td>Endrin (ppb)</td>
<td>.002</td>
<td>Residue of banned insecticide</td>
<td>Some people who drink water containing endrin in excess of the MCL over many years could experience liver problems.</td>
</tr>
<tr>
<td>Epichlorohydrin</td>
<td>TT</td>
<td>Discharge from industrial chemical factories; An impurity of some water treatment chemicals</td>
<td>Some people who drink water containing high levels of epichlorohydrin over a long period of time could experience stomach problems, and may have an increased risk of getting cancer.</td>
</tr>
<tr>
<td>Ethylene dibromide (ppt)</td>
<td>.00005</td>
<td>Discharge from petroleum refineries</td>
<td>Some people who drink water containing ethylene dibromide in excess of the MCL over many years could experience problems with their liver, stomach, reproductive system, or kidneys, and may have an increased risk of getting cancer.</td>
</tr>
<tr>
<td>Glyphosate (ppb)</td>
<td>.7</td>
<td>Runoff from herbicide use</td>
<td>Some people who drink water containing glyphosate in excess of the MCL over many years could experience problems with their kidneys or reproductive difficulties.</td>
</tr>
<tr>
<td>Heptachlor (ppt)</td>
<td>.0004</td>
<td>Residue of banned pesticide</td>
<td>Some people who drink water containing heptachlor in excess of the MCL over many years could experience liver damage and may have an increased risk of getting cancer.</td>
</tr>
<tr>
<td>Heptachlor epoxide (ppt)</td>
<td>.0002</td>
<td>Breakdown of heptachlor</td>
<td>Some people who drink water containing heptachlor epoxide in excess of the MCL over many years could experience liver damage, and may have an increased risk of getting cancer.</td>
</tr>
<tr>
<td>Hexachlorobenzene (ppb)</td>
<td>.001</td>
<td>Discharge from metal refineries and agricultural chemical factories</td>
<td>Some people who drink water containing hexachlorobenzene in excess of the MCL over many years could experience problems with their liver or kidneys, or adverse reproductive effects, and may have an increased risk of getting cancer.</td>
</tr>
<tr>
<td>Contaminant (units)</td>
<td>Traditional MCL in mg/L</td>
<td>Major sources in drinking water</td>
<td>Health effects language</td>
</tr>
<tr>
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</tr>
<tr>
<td>Hexachlorocyclopentadiene (ppb)</td>
<td>.05</td>
<td>Discharge from chemical factories</td>
<td>Some people who drink water containing hexachlorocyclopentadiene well in excess of the MCL over many years could experience problems with their kidneys or stomach.</td>
</tr>
<tr>
<td>Lindane (ppt)</td>
<td>.0002</td>
<td>Runoff/leaching from insecticide used on cattle, lumber, gardens</td>
<td>Some people who drink water containing lindane in excess of the MCL over many years could experience problems with their kidneys or liver.</td>
</tr>
<tr>
<td>Methoxychlor (ppb)</td>
<td>.04</td>
<td>Runoff/leaching from insecticide used on fruits, vegetables, alfalfa, livestock</td>
<td>Some people who drink water containing methoxychlor in excess of the MCL over many years could experience reproductive difficulties.</td>
</tr>
<tr>
<td>Oxamyl [Vydate] (ppb)</td>
<td>.2</td>
<td>Runoff/leaching from insecticide used on apples, potatoes and tomatoes</td>
<td>Some people who drink water containing oxamyl in excess of the MCL over many years could experience slight nervous system effects.</td>
</tr>
<tr>
<td>PCBs [Polychlorinated biphenyls] (ppt)</td>
<td>.0005</td>
<td>Runoff from landfills; Discharge of waste chemicals</td>
<td>Some people who drink water containing PCBs in excess of the MCL over many years could experience changes in their skin, problems with their thymus gland, immune deficiencies, or reproductive or nervous system difficulties, and may have an increased risk of getting cancer.</td>
</tr>
<tr>
<td>Pentachlorophenol (ppb)</td>
<td>.001</td>
<td>Discharge from wood preserving factories</td>
<td>Some people who drink water containing pentachlorophenol in excess of the MCL over many years could experience problems with their liver or kidneys, and may have an increased risk of getting cancer.</td>
</tr>
<tr>
<td>Picloram (ppb)</td>
<td>.5</td>
<td>Herbicide runoff</td>
<td>Some people who drink water containing picloram in excess of the MCL over many years could experience problems with their liver.</td>
</tr>
<tr>
<td>Simazine (ppb)</td>
<td>.004</td>
<td>Herbicide runoff</td>
<td>Some people who drink water containing simazine in excess of the MCL over many years could experience problems with their blood.</td>
</tr>
<tr>
<td>Toxaphene (ppb)</td>
<td>.003</td>
<td>Runoff/leaching from insecticide used on cotton and cattle</td>
<td>Some people who drink water containing toxaphene in excess of the MCL over many years could have problems with their kidneys, liver, or thyroid, and may have an increased risk of getting cancer.</td>
</tr>
<tr>
<td>Benzene (ppb)</td>
<td>.005</td>
<td>Discharge from factories; Leaching from gas storage tanks and landfills</td>
<td>Some people who drink water containing benzene in excess of the MCL over many years could experience anemia or a decrease in blood platelets, and may have an increased risk of getting cancer.</td>
</tr>
<tr>
<td>Carbon tetrachloride (ppb)</td>
<td>.005</td>
<td>Discharge from chemical plants and other industrial activities</td>
<td>Some people who drink water containing carbon tetrachloride in excess of the MCL over many years could experience problems with their liver and may have an increased risk of getting cancer.</td>
</tr>
<tr>
<td>Chlorobenzene (ppb)</td>
<td>.1</td>
<td>Discharge from chemical and agricultural chemical factories</td>
<td>Some people who drink water containing chlorobenzene in excess of the MCL over many years could experience problems with their liver or kidneys.</td>
</tr>
<tr>
<td>o-Dichlorobenzene (ppb)</td>
<td>.6</td>
<td>Discharge from industrial chemical factories</td>
<td>Some people who drink water containing o-dichlorobenzene well in excess of the MCL over many years could experience problems with their liver, kidneys, or circulatory systems.</td>
</tr>
<tr>
<td>Contaminant (units)</td>
<td>Traditional MCL in mg/L</td>
<td>Major sources in drinking water</td>
<td>Health effects language</td>
</tr>
<tr>
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</tr>
<tr>
<td>p-Dichlorobenzene (ppb)</td>
<td>.075</td>
<td>Discharge from industrial chemical factories</td>
<td>Some people who drink water containing p-dichlorobenzene in excess of the MCL over many years could experience anemia, damage to their liver, kidneys, or spleen, or changes in their blood.</td>
</tr>
<tr>
<td>1,2-Dichloroethane (ppb)</td>
<td>.005</td>
<td>Discharge from industrial chemical factories</td>
<td>Some people who drink water containing 1,2-dichloroethane in excess of the MCL over many years may have an increased risk of getting cancer.</td>
</tr>
<tr>
<td>1,1-Dichloroethylene (ppb)</td>
<td>.007</td>
<td>Discharge from industrial chemical factories</td>
<td>Some people who drink water containing 1,1-dichloroethylene in excess of the MCL over many years could experience problems with their liver.</td>
</tr>
<tr>
<td>cis-1,2-Dichloroethylene (ppb)</td>
<td>.07</td>
<td>Discharge from industrial chemical factories</td>
<td>Some people who drink water containing cis-1,2-dichloroethylene in excess of the MCL over many years could experience problems with their liver.</td>
</tr>
<tr>
<td>trans-1,2-Dichloroethylene (ppb)</td>
<td>.1</td>
<td>Discharge from industrial chemical factories</td>
<td>Some people who drink water containing trans-1,2-dichloroethylene well in excess of the MCL over many years could experience problems with their liver.</td>
</tr>
<tr>
<td>Dichloromethane (ppb)</td>
<td>.005</td>
<td>Discharge from pharmaceutical and chemical factories</td>
<td>Some people who drink water containing dichloromethane in excess of the MCL over many years could have liver problems and may have an increased risk of getting cancer.</td>
</tr>
<tr>
<td>1,2-Dichloropropane (ppb)</td>
<td>.005</td>
<td>Discharge from industrial chemical factories</td>
<td>Some people who drink water containing 1,2-dichloropropane in excess of the MCL over many years may have an increased risk of getting cancer.</td>
</tr>
<tr>
<td>Ethylbenzene (ppb)</td>
<td>.7</td>
<td>Discharge from petroleum refineries</td>
<td>Some people who drink water containing ethylbenzene well in excess of the MCL over many years could experience problems with their liver or kidneys.</td>
</tr>
<tr>
<td>Haloacetic Acids (HAA) (ppb)</td>
<td>.060</td>
<td>By-product of drinking water disinfection</td>
<td>Some people who drink water containing haloacetic acids in excess of the MCL over many years may have an increased risk of getting cancer.</td>
</tr>
<tr>
<td>Styrene (ppb)</td>
<td>.1</td>
<td>Discharge from rubber and plastic factories; Leaching from landfills</td>
<td>Some people who drink water containing styrene well in excess of the MCL over many years could have problems with their liver, kidneys, or circulatory system.</td>
</tr>
<tr>
<td>Tetrachloroethylene (ppb)</td>
<td>.005</td>
<td>Discharge from factories and dry cleaners</td>
<td>Some people who drink water containing tetrachloroethylene in excess of the MCL over many years could have problems with their liver, and may have an increased risk of getting cancer.</td>
</tr>
<tr>
<td>1,2,4-Trichlorobenzene (ppb)</td>
<td>.07</td>
<td>Discharge from textile-finishing factories</td>
<td>Some people who drink water containing 1,2,4-trichlorobenzene well in excess of the MCL over many years could experience changes in their adrenal glands.</td>
</tr>
<tr>
<td>1,1,1-Trichloroethane (ppb)</td>
<td>.2</td>
<td>Discharge from metal degreasing sites and other factories</td>
<td>Some people who drink water containing 1,1,1-trichloroethane in excess of the MCL over many years could experience problems with their liver, nervous system, or circulatory system.</td>
</tr>
<tr>
<td>1,1,2-Trichloroethane (ppb)</td>
<td>.005</td>
<td>Discharge from industrial chemical factories</td>
<td>Some people who drink water containing 1,1,2-trichloroethane well in excess of the MCL over many years could have problems with their liver, kidneys, or immune systems.</td>
</tr>
<tr>
<td>Trichloroethylene (ppb)</td>
<td>.005</td>
<td>Discharge from metal degreasing sites and other factories</td>
<td>Some people who drink water containing trichloroethylene in excess of the MCL over many years could experience problems with their liver and may have an increased risk of getting cancer.</td>
</tr>
<tr>
<td>Contaminant (units)</td>
<td>Traditional MCL in mg/L</td>
<td>Major sources in drinking water</td>
<td>Health effects language</td>
</tr>
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</tr>
<tr>
<td>TTHMs ( [\text{Total trihalomethanes}] ) (ppb)</td>
<td>0.10/.080</td>
<td>By-product of drinking water disinfection</td>
<td>Some people who drink water containing trihalomethanes in excess of the MCL over many years may experience problems with their liver, kidneys, or central nervous systems, and may have an increased risk of getting cancer.</td>
</tr>
<tr>
<td>Toluene (ppm)</td>
<td>1</td>
<td>Discharge from petroleum factories</td>
<td>Some people who drink water containing toluene well in excess of the MCL over many years could have problems with their nervous system, kidneys, or liver.</td>
</tr>
<tr>
<td>Vinyl Chloride (ppb)</td>
<td>.002</td>
<td>Leaching from PVC piping; Discharge from plastics factories</td>
<td>Some people who drink water containing vinyl chloride in excess of the MCL over many years may have an increased risk of getting cancer.</td>
</tr>
<tr>
<td>Xylenes (ppm)</td>
<td>10</td>
<td>Discharge from petroleum factories; Discharge from chemical factories</td>
<td>Some people who drink water containing xylenes in excess of the MCL over many years could experience damage to their nervous system.</td>
</tr>
</tbody>
</table>

1These arsenic values are effective January 23, 2006. Until then, the MCL is 0.05 mg/L and there is no MCLG.

Key
AL=Action Level
MCL=Maximum Contaminant Level
MCLG=Maximum Contaminant Level Goal
MFL=million fibers per liter
MRD=Maximum Residual Disinfectant Level
MRDLG=Maximum Residual Disinfectant Level Goal
mrem/year=millirems per year (a measure of radiation absorbed by the body)
N/A=Not Applicable
NTU=Nephelometric Turbidity Units (a measure of water clarity)
pCi/l=picocuries per liter (a measure of radioactivity)
ppm=parts per million, or milligrams per liter (mg/l)
ppb=parts per billion, or micrograms per liter (µg/l)
ppt=parts per trillion, or nanograms per liter
ppq=parts per quadrillion, or picograms per liter
TT=Treatment Technique
APPENDIX D - CHEMICAL MONITORING WAIVERS

Chemical monitoring waivers reduce sample frequency in a compliance period or compliance cycle. Information to support the waiver must be provided by the PWS for consideration. A waiver must be given in writing by DEQ and will specify which chemical(s) are included in the waiver, the time during which the waiver is in effect, and the sampling required for renewing the waiver. Monitoring requirements are complex based on quarterly, semi-annual, annual, and tri-annual requirements within 3-year compliance periods and 9-year compliance cycles. Information to support a use or susceptibility waiver request must be provided by the PWS for consideration. A waiver will be given in writing by MDEQ and will specify which chemical(s) are included in the waiver, the time during which the waiver is in effect, and the sampling required for renewing the waiver.

Statewide Waivers

Under the statewide waivers, public water supplies are not required to sample for any of the following:

- Endothall
- Dioxin
- Asbestos at the source
- Diquat
- Ethylene dibromide
- Cyanide
- Glyphosate
- Dibromochloropropane

Additionally, small water systems (3,300 or less) may be waived from initial quarterly monitoring requirements for the organic chemicals (includes VOCs, PCBs, SOCs) by completing one round of organic chemical sampling without detects. This statewide waiver applies only to initial baseline requirements. Repeat sampling during subsequent compliance periods will be required except where “use” or “susceptibility” waivers have been granted.

System Specific Waivers

Waivers can be requested in conjunction with the completion of the source water delineation and assessment report for a PWS. Typically, the PWS operator will need to provide additional, site-specific chemical use information for parcels within the inventory region in order to process a waiver request. Waiver requests must be in writing.

Inorganic Chemical Waivers

Inorganic chemical (IOC) waivers are available. The IOCs eligible for waiver consideration are not typically related to human activities hence they are usually either present or not in source water over the long term. DEQ will consider requests based on monitoring history, treatment and water quality. IOC waivers are not available for arsenic, nitrate/nitrite, lead/copper, or radiological monitoring. Criteria for granting a waiver are:

- Having at least three sampling events between 1993 and 2002;
- At least one sampling event must be after 01/01/2002 (in the new compliance cycle);
- All results must be consistently and reliably below the Maximum Contaminant Level (MCL).

Organic Chemical Waivers (VOC/SOC)

Organic chemical monitoring waivers reduce sample frequency in a compliance period or compliance cycle. Monitoring waivers are based either on chemical use in an area or the susceptibility of the source water to contamination.

- Use Waiver
  Use waivers may be available when it can be shown that specific organic chemicals have not or are not used, manufactured, or stored in a source water inventory region.

- Susceptibility Waiver
  Susceptibility waivers may be available when the source water is demonstrated to not be
susceptible to contamination. Susceptibility is based on factors including hazard and the presence of barriers.

**PWS Application Procedures for Waiver**

A. Statewide waiver
- No application is needed.

B. IOC Waiver
- Send letter of request to DEQ
- Include most recent IOC monitoring results

C. SOC Use Waiver
- Send letter of request to DEQ include MDEQ Form #1
- Include most recent SOC monitoring results
- Include map that extends 1 mile from each well; show land use and chemical use history by land parcel. Use MDEQ Form #2**, or:
- Include annotated SWPA Inventory Region Map listing land use and chemical use history by land parcel. Use MDEQ Form #2**.

D. SOC Susceptibility Waiver
- Send letter of request to DEQ include MDEQ Form #1
- Include most recent SOC monitoring results
- Include completed MDEQ Form #4, or;
- Include delineation, inventory, and susceptibility sections from SWDAR. Artesian conditions must be documented under all pumping regimes in order to achieve a susceptibility waiver.

E. VOC Use Waiver
- Send letter of request to DEQ include MDEQ Form #1
- Include VOC monitoring results
- Include map that extends 1 mile from each well listing land use and chemical use history by land parcel. Use MDEQ Form #2**, or:
- Include annotated SWPA Inventory Region Map listing land use and chemical use history by land parcel. Use MDEQ Form #2**. Completion of MDEQ Form #3 is optional

F. For VOC Susceptibility Waiver
- Send letter of request to DEQ include MDEQ Form #1
- Include SOC monitoring results
- Include completed MDEQ Form #4, or;
- Include delineation, inventory, and susceptibility sections from SWDAR. Artesian conditions must be documented under all pumping regimes in order to achieve a susceptibility waiver.

The written request and supporting documentation should be forwarded to:

Waiver Manager
Montana Department of Environmental Quality
109 Cooperative Way, Ste. 105
Kalispell, Montana 59901.

** An inventory form (MDEQ Form #2) should be completed for each parcel and should include a map locator number, which cross references to the map, brief land use description, and list of chemicals used or in-use. This site-specific information comes from parcel owners who should be contacted by the PWS operator and asked to provide a list of herbicides, pesticides, solvents, or fuels and approximate quantity currently in use or stored on their property.
## Summary of New Requirements under the Short-Term Revisions for Lead and Copper Rule

<table>
<thead>
<tr>
<th>New Requirements under the Short-Term Revisions</th>
<th>Previously Required under the LCR</th>
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<tbody>
<tr>
<td><strong>Minimum Number of Samples Required</strong></td>
<td></td>
</tr>
<tr>
<td>PWSs collecting &lt; 5 samples, the 90th percentile value is the highest concentration.</td>
<td>PWSs could not collect &lt; 5 samples.</td>
</tr>
<tr>
<td>PWSs with &lt; 5 taps must collect more than 1 sample from the same site on alternate days; or with written DEQ permission, can collect &lt; 5 samples if all available drinking water taps are sampled.</td>
<td></td>
</tr>
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### Summary of New Requirements under the Short-Term Revisions for Lead and Copper Rule

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<td>Triennial monitoring must be conducted no later than every 3rd CY.</td>
<td>Rule did not contain this language.</td>
</tr>
<tr>
<td>PWSs on a DEQ-specified 4-month monitoring schedule must begin annual monitoring during the CY after the end of the 2nd 6-month monitoring period, or after the end of the 3-year period for triennial monitoring, in which they qualify for reduced monitoring.</td>
<td>Rule did not specify when annual or triennial monitoring must begin for a system on a DEQ-specified alternate 4-month monitoring schedule.</td>
</tr>
<tr>
<td>PWSs on reduced monitoring must return to standard monitoring if they have a lead ALE or an optimal water quality parameter (OWQP) excursion. Standard monitoring must resume January 1 of the CY following the lead ALE or OWQP excursion.</td>
<td>Rule did not require PWSs to return to standard monitoring if they met their OWQPs but had a lead ALE; nor did it specify the date by when standard monitoring would resume.</td>
</tr>
<tr>
<td>PWSs can resume annual monitoring in the CY following the end of the 2nd consecutive 6-month monitoring period in which they met the lead AL and OWQPs.</td>
<td>Rule did not specify when reduced monitoring would begin.</td>
</tr>
<tr>
<td>PWSs on a 9-year monitoring waiver must collect samples no later than every ninth CY.</td>
<td>Rule did not include this clarification.</td>
</tr>
<tr>
<td>For monitoring periods of &lt; 6 months (e.g., 4-month tap monitoring), the monitoring period end is the last date samples can be collected during that period (e.g., Sept. 30).</td>
<td>Rule did not include this clarification.</td>
</tr>
</tbody>
</table>

### Water Quality Parameter Monitoring

<table>
<thead>
<tr>
<th>Large PWSs must begin water quality parameter (WQP) monitoring in the 1st 6-month period after DEQ sets OWQPs.</th>
<th>Large PWSs were required to begin WQP monitoring on the date DEQ set OWQPs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>For small or medium PWSs that exceed an AL during reduced lead and copper tap monitoring, the 1st 6-month WQP monitoring period is the same as the lead and copper tap monitoring period in which the ALE occurred.</td>
<td>Rule synchronized the end of the 6-month period for WQP monitoring with the end of the reduced lead and copper tap monitoring period during which an AL was exceeded.</td>
</tr>
<tr>
<td>Annual WQP tap monitoring for qualifying systems must begin during the CY following the end of the monitoring period in which the 3rd consecutive year of 6-month monitoring occurs.</td>
<td>Rule did not include these clarifications.</td>
</tr>
<tr>
<td>Triennial monitoring must begin no later than 3 CYs after the PWS qualifies for triennial monitoring.</td>
<td></td>
</tr>
<tr>
<td>Triennial WQP monitoring must be conducted no later than every 3rd CY.</td>
<td>Rule did not include this clarification.</td>
</tr>
</tbody>
</table>

### Source Water Monitoring

<table>
<thead>
<tr>
<th>PWSs on triennial source water monitoring must collect samples at least every 3 years.</th>
<th>Required samples to be collected once during the 3-year compliance period.</th>
</tr>
</thead>
<tbody>
<tr>
<td>The 1st annual source water monitoring period begins during the year in which DEQ sets MPLs or determines no SOWT is needed.</td>
<td>Required this monitoring to begin on the date that DEQ set MPLs or determines that SOWT is not needed.</td>
</tr>
<tr>
<td>PWSs on 9-year source water monitoring must collect samples at least every 9 years.</td>
<td>Required samples to be collected once during the 9-year compliance cycle.</td>
</tr>
</tbody>
</table>

### Lead and Copper Tap Reduced Monitoring Criteria
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</thead>
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<tr>
<td>All PWSs must meet the lead AL as a condition of reduced lead and copper tap monitoring.</td>
<td>PWSs could qualify for reduced monitoring based on meeting their OWQPs only.</td>
</tr>
</tbody>
</table>

**Consumer Notice of Lead Results**

<table>
<thead>
<tr>
<th>PWSs must provide lead tap sampling results, lead health effects language, steps to reduce exposure, contact information, and the lead MCLG and AL values and definitions to persons served at tested sites within 30 days of learning of results.</th>
<th>PWSs were not required to notify individual homeowners of their tap monitoring results.</th>
</tr>
</thead>
<tbody>
<tr>
<td>PWSs must provide DEQ with a sample consumer notification and certification of its proper delivery within 3 months after the end of the applicable monitoring period.</td>
<td>Rule did not require lead consumer notice or the corresponding DEQ reporting requirement.</td>
</tr>
</tbody>
</table>

**Advanced Notification/Approval of Long-Term Treatment Changes and Source Additions**

<table>
<thead>
<tr>
<th>PWSs on reduced lead and copper tap monitoring must report any upcoming long-term change in treatment or any source addition to DEQ and must receive prior approval before implementing the change or addition.</th>
<th>Rule did not specify that treatment changes had to be “long-term.” Prior DEQ approval was not needed before implementing the change or source addition.</th>
</tr>
</thead>
<tbody>
<tr>
<td>The notification must be in writing, at a time specified by their DEQ, or as soon as possible before making the change or addition.</td>
<td>PWSs were encouraged to provide prior notification but were required to provide it within 60 days after the addition or change.</td>
</tr>
</tbody>
</table>

**Public Education**

<table>
<thead>
<tr>
<th>Requires C and NTNC supplies to deliver the same mandatory language. Adds flexibility for PWSs to tailor the language for other required topics.</th>
<th>C and NTNC supplies had separate mandatory language. Rule did not allow the PWS to tailor the language. Since all PE language was mandatory, the Rule did not include an optional provision requiring prior DEQ review and approval of the language.</th>
</tr>
</thead>
<tbody>
<tr>
<td>PWSs must submit public education language for DEQ review and approval at DEQ’s option.</td>
<td></td>
</tr>
<tr>
<td>Requires additional information to be included in community supply materials.</td>
<td></td>
</tr>
<tr>
<td>For PWSs serving a large percent of non-English speaking consumers, the notice must include in appropriate languages: its importance, or where to get a translated copy or needed assistance.</td>
<td>PWSs were required to provide materials in other languages in those communities where a significant proportion spoke a language other than English.</td>
</tr>
<tr>
<td>For community systems, adds organizations that PWSs must partner with (including those outside service area) to disseminate the message to at-risk populations as well as changes the ways information is disseminated.</td>
<td>Delivery was limited to organizations within service area. Rule included fewer public education activities.</td>
</tr>
<tr>
<td>Allows DEQ to extend 60-day timeframe for completion of public education if system has initiated public education.</td>
<td>This extension was not allowed.</td>
</tr>
</tbody>
</table>

**Consumer Confidence Report (CCR) Rule**

<p>| All community supplies must include mandatory language about lead, health effects language, and ways to reduce exposure to lead in every CCR. Community supplies may write their own educational statements in consultation with DEQ. | Only community supplies that detected lead above 15 ppb in &gt; 5% of homes sampled had to provide an informational statement. CCR Rule included suggested language that was less specific in several areas. |</p>
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<td><strong>New Requirements under the Short-Term Revisions</strong></td>
</tr>
<tr>
<td><strong>Reevaluation of Lead Service Lines</strong></td>
</tr>
<tr>
<td>PWSs that resume LSLR must update their LSL inventory to include those that were classified as “replaced through testing.”</td>
</tr>
</tbody>
</table>
Suggested Directions for Homeowner Tap Sample Collection Procedures

These samples are being collected to determine the lead and copper levels in your tap water. This sampling effort is required by the U.S. Environmental Protection Agency and your State, and is being accomplished through the cooperation of homeowners and residents.

Collect samples from a tap that has not been used for a minimum of 6 hours, but that has been flushed within the last 12 hours. Because of this requirement, the best time to collect samples is either early in the morning or in the evening upon returning from work. Be sure to use taps that have been in general use by your household for the past few months. The collection procedure is described in more detail below.

1. Prior arrangements will be made with the customer to coordinate the sample collection event. Dates will be set for sample kit delivery and pick-up by water department staff.

2. There must be a minimum of 6 hours during which there is no water used from the tap the sample is taken from and any taps adjacent or close to that tap. The water department recommends that either early mornings or evenings upon returning home are the best sampling times to ensure that the necessary stagnant water conditions exist.

3. A kitchen or bathroom cold-water faucet is to be used for sampling. If you have water softeners on your kitchen taps, collect your sample from the bathroom tap that is not attached to a water softener, if possible. **Do not remove the aerator prior to sampling.** Place the opened sample bottle below the faucet and gently open the cold water tap. Fill the sample bottle to the line marked “1000-mL” and turn off the water.

4. Tightly cap the sample bottle and place in the sample kit provided. Please review the sample kit label at this time to ensure that all information contained on the label is correct.

5. **IF ANY PLUMBING REPAIRS OR REPLACEMENT HAS BEEN DONE IN THE HOME SINCE THE PREVIOUS SAMPLING EVENT, NOTE THIS INFORMATION ON THE LABEL AS PROVIDED. ALSO IF YOUR SAMPLE WAS COLLECTED FROM A TAP WITH A WATER SOFTENER, NOTE THIS AS WELL.**

6. Place the sample kit outside of the residence in the location of the kit’s delivery so that department staff may pick up the sample kit.

7. Results from this monitoring effort will be provided to participating customers when reports are generated for the State. However, if excessive lead and/or copper levels are found, immediate notification will be provided (usually 10 working days from the time of sample collection).

Call _______________ at _______________ if you have any questions regarding these instructions.

To be completed by Resident

Water was last used: _______date/time                          Sample was collected date/time_______

I have read the above directions and have taken a tap sample in accordance with these directions.

Signature ________________    Date_________
Consumer Notice of Lead Tap Water Monitoring Results

PWS Name: __________________  PWSID: ________________ Monitoring Period: ________________

Delivery Method
(A copy of the letter that you sent to the consumers must be submitted with this form.)

1. Community water system (choose a or b):
   a. Consumers were notified by U.S. Mail on ____________ (date).
   b. Consumers were notified by hand/direct delivery on ____________ (date).

2. Non Transient Non Community water system (choose a or b):
   a. The lead and copper results were posted on ____________ (date) within the facility in which the samples were collected and the results will be posted until the next lead/copper results are reported.
   b. Consumers were notified by hand/direct delivery on ____________ (date)

The water system named above hereby certifies that its lead and copper consumer notice has been provided to each person it serves at the specific sampling site from which the sample was tested. The water system also certifies that these results and the following information were provided to such persons within **30 days of receiving the test results** from the laboratory:

---

**☐** Individual tap results from lead and copper tap water monitoring.

**☐** An explanation of the health effects of lead and copper with steps that consumers can take to reduce exposure to lead and copper in drinking water.

**☐** Contact information for your water utility.

**☐** The maximum contaminant level goals and action levels for lead and copper, and the definitions of these two terms from.

Signature: __________________________  Print Name: __________________________
Job Title: ___________________________  Phone: ___________________________  Date: ________________

☐ Complete this form.
☐ Within 3 months following the end of the monitoring period, mail this form, with a copy of the consumer notification to:

Montana Department of Environmental Quality, Lead and Copper Rule Manager, P.O. Box 200901, Helena, MT 59620-0901.

If you have any questions, please call 406-444-4400.

http://www.deq.mt.gov/wqinfo/pws/leadcopper.mcpx
Example- Consumer Notice from Public Water System to NTNC System Consumers

Date__________________________

Sample Location: ______________________________ Lead and Copper Results

From:_________________________________ [PWS Name] ______________ [PWSID] NTNC
_______________________________________________________ [PWS Contact Person, Title]
_______________________________________________________ [PWS Contact Address]
_______________________________________________________ [PWS Contact Phone]

Dear Consumers,

This letter is to report the lead and copper results for the public water supply system. The reported results are
__________________________________________________________ milligrams/liter (mg/L) for lead, and
__________________________________________________________ mg/L for copper.

The 90th percentile lead and copper levels for our system are ______ mg/L for lead, and ______ mg/L for copper. The
action level for lead is 0.015 mg/L with the maximum contaminant level goal (MCLG) set at zero. The action level and
MCLG for copper is 1.3 mg/L. The results indicate that we ______ [have/have not] exceeded the lead action
level and ______ [have/have not] exceeded the copper action level.

What Does This Mean?
Under the authority of the Safe Drinking Water Act, EPA set the action level for lead in drinking water at 0.015 mg/L and
1.3 mg/L for copper. This means utilities must ensure that water from the customer’s tap does not exceed these levels in at
least 90 percent of the locations sampled (90th percentile value). The action level is the concentration of a contaminant
which, if exceeded, triggers treatment or other requirements which a water system must follow. If water from the tap does
exceed this limit, then the utility must take certain steps to correct the problem. Because lead may pose serious health risks,
the EPA set a Maximum Contaminant Level Goal (MCLG) of zero for lead. The MCLG is the level of a contaminant in
drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.

What Are The Health Effects of Lead?
Lead can cause serious health problems if too much enters your body from drinking water or other sources. It can cause
damage to the brain and kidneys, and can interfere with the production of red blood cells that carry oxygen to all parts of
your body. The greatest risk of lead exposure is to infants, young children, and pregnant women. Scientists have linked the
effects of lead on the brain with lowered IQ in children. Adults with kidney problems and high blood pressure can be
affected by low levels of lead more than healthy adults. Lead is stored in the bones, and it can be released later in life.
During pregnancy, the child receives lead from the mother’s bones, which may affect brain development.

What Are The Health Effects of Copper?
Copper is an essential nutrient, but some people who drink water containing copper in excess of the action level over a
relatively short amount of time could experience gastrointestinal distress. Some people who drink water containing copper
in excess of the action level over many years could suffer liver or kidney damage. People with Wilson’s Disease should consult their personal doctor.

**What Are The Sources of Lead and Copper?**

Lead is a common metal found in the environment. The main sources of lead exposure are lead-based paint and lead-contaminated dust or soil. Drinking water is also a possible source of lead exposure. Most sources of drinking water have no lead or very low levels of lead. Most lead gets into drinking water after the water leaves the local well or treatment plant and comes into contact with plumbing materials containing lead. These include lead pipes, lead solder (commonly used until 1986), as well as faucets, valves, and other components made of brass.

Copper works its way into the water by dissolving from copper pipes in the household plumbing. The longer the water has stood idle in the pipes, the more copper it is likely to have absorbed. Newer homes with copper pipes may be more likely to have a problem. Over time, a coating forms on the inside of the pipes and can insulate the water from the copper in the pipes. In newer homes, this coating has not yet had a chance to develop.

**What Can I Do To Reduce Exposure to Lead and Copper in Drinking Water?**

Run your water to flush out lead and copper If water hasn’t been used for several hours, run water for 15-30 seconds or until it becomes cold or reaches a steady temperature before using it for drinking or cooking.. This flushes lead and copper-containing water from the pipes.

- Use cold water for cooking and preparing baby formula.
- Do not boil water to remove lead or copper.
- Look for alternative sources or treatment of water.
- Test your water for lead or copper.
- Identify if your plumbing fixtures contain lead or copper.

**For More Information**

Call us at [PWS phone number]. For more information on reducing lead exposure around your home and the health effects of lead, visit EPA’s Web site at [www.epa.gov/lead](http://www.epa.gov/lead), call the National Lead Information Center at 800-424-LEAD, or contact your health care provider. You may also contact Montana Department of Environmental Quality, 406-444-4400, Public Water Supply Program, P.O. Box 200901, Helena, MT 59620-0901. [http://www.deq.mt.gov/wqinfo/pws/leadcopper.mcpx](http://www.deq.mt.gov/wqinfo/pws/leadcopper.mcpx)
Example- Consumer Notice from Public Water System to Community System Consumers

To: ________________________     Date _________________

_________________________
_________________________
_________________________

Sample Location: __________________________________Lead and Copper Results

From:___________________________[PWS Name] _______________ [PWSID] Community
__________________________________________________[PWS Contact Person, Title]
______________________________________________________[PWS Contact Address]
_______________________________________________________[PWS Contact Phone]

Dear ______________,

Thank you for participating in the lead and copper tap monitoring that was recently conducted. This letter is to report the lead and copper results for the above-designated sample location. The reported results are ______ milligrams/liter (mg/L) for lead, and ______ mg/L for copper.

The 90th percentile lead and copper levels for our system are ______ mg/L for lead, and ______ mg/L for copper. The action level for lead is 0.015 mg/L with the maximum contaminant level goal (MCLG) set at zero. The action level and MCLG for copper is 1.3 mg/L. The results indicate that we ______________ [have/have not] exceeded the lead action level and ______________ [have/have not] exceeded the copper action level.

What Does This Mean?

Under the authority of the Safe Drinking Water Act, EPA set the action level for lead in drinking water at 0.015 mg/L and 1.3 mg/L for copper. This means utilities must ensure that water from the customer’s tap does not exceed these levels in at least 90 percent of the homes sampled (90th percentile value). The action level is the concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow. If water from the tap does exceed this limit, then the utility must take certain steps to correct the problem. Because lead may pose serious health risks, the EPA set a Maximum Contaminant Level Goal (MCLG) of zero for lead. The MCLG is the level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.

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