

# Guidance for Actions to be Taken Following Public Drinking Water System Depressurization



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Drinking Water Program  
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# Table of Contents

Summary.....	1
Purpose and Scope.....	1
Authority.....	2
Definitions.....	2
1 Activities Following Depressurization .....	2
1.1 Unplanned or Emergency Situation Depressurization .....	2
1.1.1 DEQ Notification for Unplanned or Emergency Depressurization .....	3
1.1.2 Public Notification for Unplanned or Emergency Depressurization .....	4
1.1.3 Disinfection for Unplanned or Emergency Depressurization .....	4
1.1.4 Sampling and Analysis for Unplanned or Emergency Depressurization .....	5
1.1.5 Pressure Monitoring Study and Report for Unplanned or Emergency Depressurization .....	5
1.2 Planned Maintenance or Repair Situation Depressurization .....	6
References.....	6

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## Summary

This document presents guidance to assist with defining actions necessary when a public water system loses pressure unexpectedly or anticipates a possible loss of pressure during maintenance or repair activities. A water system normally operates at a minimum positive pressure to prevent infiltration of contaminants. Infiltration into the system is a concern whenever water pressure drops below 20 pounds per square inch (psi). Such a pressure drop can occur for many reasons, including broken mains, loss of power, loss of sources of supply, booster pump failure, and other system component failures.

## Purpose and Scope

This guidance is intended to help define actions required by Idaho rules following a depressurization event. Idaho Department of Environmental Quality (DEQ) guidance does not have the force of law or regulation, nor does it replace best professional judgment; it provides a starting point and assistance in the design, construction, operation, and maintenance of system facilities.

This guidance is intended to assist public water system owners and operators with more detailed information and clarifications about required actions identified in the Idaho Rules for Public Drinking Water Systems (“Rules”), IDAPA 58.01.08 Section 552.01.b. This section of the Rules addresses actions to be taken in response to low to no pressure events, which are defined in the Rules as below 20 pounds per square inch (psi).

Section 552.01.b. of the Rules states (emphasis added):

- i. Any public water system shall be capable of providing sufficient water during maximum day demand conditions, including fire flow where provided, to maintain a minimum pressure of twenty (20) psi throughout the distribution system, at ground level, as measured at the service connection or along the property line adjacent to the consumer’s premises.

This section also defines actions required or recommended following depressurization (emphasis added):

- ii. Public Notification
  - 1) During unplanned or emergency situations, when water pressure within the system is known to have fallen below twenty (20) psi, the water supplier must notify the Department, provide public notice to the affected customers within twenty-four (24) hours, and disinfect the system. When sampling and corrective procedures have been conducted and after determination by the Department that the water is safe, the water supplier may re-notify the affected customers that the water is safe for consumption. The water supplier shall notify the affected customers if the water is not safe for consumption.
  - 2) During planned maintenance or repair situations, when water pressure within the system is expected to fall below twenty (20) psi, the water supplier must provide public notice to the affected customers prior to the planned maintenance or repair activity and shall ensure that the water is safe for consumption.
- iii. If an initial investigation by the water supplier fails to discover the causes of inadequate or excessive pressure, the Department may require the water supplier to conduct a local pressure monitoring study to diagnose and correct pressure problems. Compliance with these requirements by water systems that do not have a meter vault or other point of access at the service connection or along the property line adjacent to the consumer’s premises where pressure in the distribution system can be reliably measured shall be

determined by measurements within the consumer's premises, or at another representative location acceptable to the Department.

- iv. Copies of pressure monitoring study reports required under Subsection 552.01.b.iii. detailing study results and any resulting corrective actions planned or performed by the public water system shall be submitted to the Department in accordance with these rules.

This guidance is focused on actions to be taken following depressurization but does not address how to correct pressure related problems. Addressing pressure related problems are specific to the situation.

## Authority

The Idaho Legislature has given the Idaho Board of Environmental Quality the authority to promulgate rules governing quality and safety of drinking water, pursuant to Title 39, Chapter 1, Idaho Code. DEQ promulgated the Rules, for the purpose of controlling and regulating the design, construction, operation, maintenance, and quality control of public drinking water systems, to provide a degree of assurance that such systems are protected from contamination and maintained free from contaminants that may injure the health of the consumer.

## Definitions

The following definitions apply to this guidance:

- **Depressurization Event.** Any instance where distribution system pressure falls below 20 psi in a public water system.
- **Pressure Monitoring Study.** The systematic examination of distribution system pressure at one or more monitoring locations over a defined period.
- **Pressure Monitoring Study Report.** The presentation of data from a pressure monitoring study, including description of the problem, scope of investigation, study methods, results, conclusions, and recommendations.

## 1 Activities Following Depressurization

Depressurization events are important because of the increased potential for contamination into the distribution system. The intent of Section 552.01.b of the Rules is to ensure that water system customers are aware of these situations through public notification and to ensure public water system owners and operators take adequate measures to ensure the water is safe and reliable for their customers.

The Rules define two situations for depressurization requirements:

- Unplanned or emergency situations
- Planned maintenance or repair situations

The actions required for each of these situations are described in the following sections.

### 1.1 Unplanned or Emergency Situation Depressurization

Unplanned depressurization events include water main breaks, power or pump failures, or other situations. In the event of unplanned or emergency depressurization, the Rules require the system owner or operator take the following actions:

1. Notify DEQ, as described in [1.1.1](#).

2. Provide public notice to the affected customers within 24 hours, as described in [1.1.2](#).
3. Disinfect (or flush) the system, as described in [1.1.3](#).
4. Collect and analyze samples, as described in [1.1.4](#).
5. If the cause of depressurization cannot be determined, a pressure monitoring study may be required, as described in [1.1.5](#).

Guidance regarding implementing these requirements is set forth below.

#### **1.1.1 DEQ Notification for Unplanned or Emergency Depressurization**

Although the rules require notifying DEQ of each depressurization event, there is no time requirement associated with this requirement. DEQ recommends notifying your drinking water representative at the DEQ regional office or the local public health department office as soon as possible:

- Boise Region (208) 373-0550, toll-free: (888) 800-3480
  - Central District Health (208) 375-5211
  - Southwest District Health (208) 455-5300
- Coeur d'Alene Region (208) 769-1422, toll-free: (877) 370-0017
  - Panhandle health District (208) 415-5100
- Idaho Falls Region (208) 528-2650, toll-free: (800) 232-4635
  - Eastern Idaho Public Health District (208) 522-0310
- Lewiston Region (208) 799-4370, toll-free: (877) 541-3304
  - North Central Health District (208) 799-3100
- Pocatello Region (208) 236-6160, toll-free: (888) 655-6160
  - Southeastern Idaho Public Health (208) 233-9080
- Twin Falls Region (208) 736-2190, toll-free (800) 270-1663
  - South Central Public Health (208) 734-5900

Once notified, DEQ or public health district staff can provide technical assistance to minimize risk to the public served by the system. Public health district staff can coordinate technical assistance or other responses with DEQ or vice versa.

Depending upon the severity of the event, the system may also choose to do the following:

- Contact the Idaho State EMS Communications Center ([StateComm](#)):
  - StateComm operates 24 hours a day, 7 days a week, 365 days a year, providing emergency dispatch and communications for Emergency Medical Services (EMS), Idaho Transportation Department, hazardous material incidents, public health emergencies, AMBER Alerts, and many other situations.
  - StateComm can be reached at 1-800-632-8000 or 1-208-846-7610.
- Contact IDWARN, a network of utilities helping utilities, to address mutual aid during emergencies. For additional information about IDWARN, send email to [Don.Lee@deq.idaho.gov](mailto:Don.Lee@deq.idaho.gov).

### 1.1.2 Public Notification for Unplanned or Emergency Depressurization

The Rules require notifying all persons impacted by the depressurization within 24 hours of depressurization, but this section of the Rules does not specify the information that must be conveyed by such notification. Pressure loss has significant potential to cause serious adverse effects on human health, which requires a Tier 1 public notification as identified in 40 Code of Federal Regulations (“CFR”) Subpart 141.202. For additional information on Tier 1 public notification requirements, including manner of notice, see 40 CFR 141.202. The basic requirements of a notice include the following:

1. A description of the violation or situation that occurred: in this case, the depressurization
2. When the violation or situation occurred
3. Any potential adverse health effects from the violation or situation
4. The population at risk, including subpopulations particularly vulnerable if exposed to a contaminant
5. Whether an alternative water supply should be used
6. What actions consumers should take, including when they should seek medical help, if known
7. What the public water system owner/operator is doing to correct the situation
8. When the water system expects to return to compliance or resolve the situation
9. The name and contact information of the water system owner, operator, or designee
10. A statement to encourage the recipients to distribute the notice to other persons served.

Please work directly with drinking water staff in your DEQ regional office or your local public health district office to address your specific situation.

DEQ or the public health district may require a system owner or operator to issue a boil advisory following a depressurization event. Boiling water for one (1) minute is sufficient to inactivate biological contamination (EPA, 2013). A “Boil Water Advisory Due to Loss of Pressure” template is available online at [www.deq.idaho.gov/pws-switchboard](http://www.deq.idaho.gov/pws-switchboard) under Public Notification Templates. For a water main break, the system owner can often isolate the break and complete repairs without pressure loss to other areas within the distribution network, but some breaks cannot be isolated and require interruption of service over a much wider area. The widespread loss of service may require a boil water advisory.

There are circumstances where a boil advisory would not be issued and an alternative water supply should be obtained. For example, if the water supply is known to have elevated levels of contaminants such as lead, arsenic, or nitrate, a boil advisory would not be issued because these contaminants are concentrated by boiling. Additionally, if a water supply contains volatile organic contaminants, boiling will aerosolize these contaminants. Under these circumstances, DEQ or the public health district will require the system owner or operator to provide public notification to customers to use an alternative water supply, such as bottled water, for drinking, preparing food, brushing teeth, washing dishes and other potable purposes.

Public water system owners or operators may want to consider providing advance general notification to customers *before* depressurization occurs, such as information on how customers can protect themselves in the event unplanned or emergency depressurization occurs. This advance notification can be included periodically with the water bill, system newsletter, or on the system’s Internet site. System users who have been educated on what to do before an event are more likely to respond as needed to protect their health when depressurization occurs.

### 1.1.3 Disinfection for Unplanned or Emergency Depressurization

Following an unplanned or emergency situation in which system pressure has fallen below 20 psi, the Rules require disinfection of the distribution system and total coliform sampling to verify the absence of

coliform bacteria. The goal of disinfection following depressurization is to remove contamination from the system, a goal that can be achieved by either of the following:

- Disinfecting using a disinfectant (typically chlorine bleach) that is certified by National Sanitation Foundation (NSF) or by a comparable certifying organization and flushing. Work with DEQ or public health district staff to determine an appropriate disinfectant residual level for distribution disinfection.
- DEQ may approve flushing without additional disinfection as an effective means of mechanically removing contaminants following depressurization. Unidirectional flushing, in which valves and hydrants are selectively opened to ensure flow in only one direction, should be used as much as practical to ensure all contamination has been removed from the system. Unidirectional flushing provides higher flow and better scouring to remove debris and contaminants. Please work with DEQ regarding unidirectional flushing.

#### **1.1.4 Sampling and Analysis for Unplanned or Emergency Depressurization**

Following an unplanned or emergency situation in which system pressure has fallen below 20 psi, the rules require total coliform sampling and analysis to verify the absence of coliform bacteria. These actions should include the following:

- Sampling for total coliform bacteria is required. The samples need to be taken after the system has been disinfected and/or flushed and the disinfectant residuals have returned to their normal operating level. The sampling conducted following a depressurization event is not part of the drinking water system's routine bacteriological sampling for compliance purposes. Samples are marked as "special" or "construction" and are not used to determine compliance with the total coliform rule. If sample analysis confirms the continued presence of bacterial contaminants, additional disinfection and flushing is required in affected system components. DEQ or the public health district will typically allow a system owner to lift a boil advisory following two days of total coliform absent sample results.
- If the system is vulnerable to other contaminants, samples for these should be collected as well.

DEQ or the health district will need the following information to determine whether the water is safe:

- Disinfectant residual concentration prior to total coliform sampling.
- Sampling results, after flushing, at each total coliform bacteria sampling site. Include disinfectant residual level for each total coliform sample.
- Other pertinent data as may be necessary to confirm water safety.

#### **1.1.5 Pressure Monitoring Study and Report for Unplanned or Emergency Depressurization**

If the cause of depressurization remains unknown following the initial investigation of the event, DEQ may require a pressure monitoring study to help diagnose and correct pressure problems. If the system does not have calibrated pressure measurement and recording equipment, DEQ may be able to provide such equipment on loan; contact your DEQ regional office for additional information.

Public water system owners or operators may want to hire an engineering consultant to perform a pressure analysis depending on the complexity of the system and the qualifications and experience of the licensed operator. The results of the study must be presented in a report to DEQ, but it may be beneficial for the system owner or operator to first provide the raw data to DEQ. If changes to the system are required to resolve the problem, DEQ staff can identify the documents that are required by the rules.

The contents of the pressure monitoring study report should include at least the following:

- A description and scope of the problem the study investigated.
- A description of the methods used to study the problem.

- The results of the study—the data obtained.
- Conclusions drawn from the results. In particular, the study should state whether the system meets and will continue to meet required minimum pressure.
- Recommendations for corrective actions needed to achieve adequate pressure, if applicable.

## **1.2 Planned Maintenance or Repair Situation Depressurization**

When depressurization is expected due to planned maintenance or repairs, the system must provide public notice to the affected customers beforehand in accordance with IDAPA 58.01.08 Section 552.01.b.ii(2). DEQ recommends including at least the following in this public notice:

- Details about work to be done, including the dates and the expected duration of the work.
- Information on actions users need to take during and after the loss of pressure.
- Contact information for water system staff who can answer questions, along with contact information for the DEQ regional office or local public health district.

Following depressurization, the system must take such actions as necessary to ensure that the water is safe for consumption. DEQ recommends disinfecting, flushing, and taking samples as described in sections 1.1.3 and 1.1.4 of this guidance.

## **References**

EPA [US Environmental Protection Agency]. 2013. Emergency Disinfection of Drinking Water. Accessed 9/25/2013 at <http://water.epa.gov/drink/emereprep/emergencydisinfection.cfm>.

EPA [US Environmental Protection Agency]. 2012. 40 CFR 141, National Primary Drinking Water Regulations. Accessed 7/21/2014 at <http://www.gpo.gov/fdsys/pkg/CFR-2012-title40-vol24/xml/CFR-2012-title40-vol24-part141.xml>.

IDAPA 58.01.08. 2013. *Idaho Rules for Public Drinking Water Systems*. Accessed 6/17/2014 at <http://adminrules.idaho.gov/rules/current/58/0108.pdf>.