
ENVIRONMENTAL Fact Sheet



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Guidance on Addressing Bacteria Contamination in Very Small Water Systems

This guidance is intended to assist small transient public water systems in New Hampshire to quickly evaluate and correct bacteria contamination for compliance with the Total Coliform Rule (TCR) and the Groundwater Rule (GWR). Under some circumstances, systems may be contacted to perform *immediate* actions such as a boil order, to prevent the spread of bacteria contamination.

If your water system has incurred two maximum contaminant level (MCL) bacteria violations within a 12-month period, you are probably receiving this fact sheet along with a **Letter of Deficiency (LOD)**. The LOD requests that you perform a more detailed evaluation and correct the deficiencies identified within a set timeframe. This document is provided to assist you and your consultant in this evaluation.

COLIFORM BACTERIA SAMPLING UNDER THE TCR

Total coliform bacteria are used as indicators for the possible presence of disease-causing organisms, such as fecal or other contamination sources. Two or more positive total coliform samples in a month will result in a **standard MCL violation** for the water system.

***E. coli* and fecal bacteria** are disease-causing bacteria in the coliform group, which originate from warm-blooded human or animal sources. In New Hampshire, a positive *E. coli* or positive fecal coliform sample results in an immediate **Boil Order** for the public water system.

ADDRESSING THE VIOLATION

- 1. System Evaluation** – DES recommends collecting several general system evaluation samples to help you isolate and identify the problem. These samples may be in addition to those required for compliance with the TCR requirements. A “General System Evaluation Form” is provided at the end of your Master Sampling Schedule at <http://des.nh.gov/onestop/> specifically for this purpose. If not already sampled, additional system evaluation samples should include:
 - Raw well source(s). **Required** after any positive bacteria results effective Dec. 1, 2009.
 - Sample taps following major treatment units, such as filters, aeration units, others as applicable.
 - Sample taps before and after atmospheric storage.
 - Distribution entry point sample tap (last tap in the pump house).
- 2. Eliminating the Source of Contamination** – If contamination is from the well source, examine your well construction and sanitary protective area for possible bacteria sources. Contact a **licensed** well contractor (see <http://des.nh.gov/onestop/> for current listings), to diagnose any construction deficiencies in your existing well source. Note that all PWS modifications are subject to prior approval by DES.
- 3. Shock Chlorination** – Please refer to DES fact sheet **DWGB-4-3 Disinfecting Public Water Systems**, or contact the DES Drinking Water and Groundwater Bureau for the procedure for disinfecting your well source. Proper sanitizing of the water system is required after all repairs or new work is completed. Note that installation of permanent disinfection requires prior approval by DES.

4. **Persistent bacteria violations** – If your system has followed steps 1-3 above and you wish to continue serving water to the public, two remaining may be approved to address recurring bacteria violations:
- (a) Develop an alternative water source - either a new well or connection to another public water system (PWS). Bottled water cannot be accepted as a permanent solution to address a PWS violation.
 - (b) Install disinfection treatment - systems that install permanent disinfection are required to conduct **six months of raw water *E.coli* sampling**. If *E.coli* is detected, disinfection will not be approved until all other deficiencies are corrected, and the system will be required to report daily chlorine residuals and monthly operating reports to DES, among other requirements under the Groundwater Rule.
5. **Disinfection options** – DES will **not** approve the installation of disinfection as a corrective measure for poorly maintained well sources, inadequate operations or maintenance, or resolution of correctible well and/or system construction deficiencies. However, if you have exhausted all other corrective measures and wish to pursue disinfection, the following must be submitted for state approval **prior** to its installation:
1. **Consultant Report** detailing the results of the bacteria evaluation and corrective measures, including the recommendation to install permanent treatment.
 2. **Simple schematic** showing the location and sizes of all existing and proposed treatment equipment, source water meter, sampling taps, and storage and/or pressure tanks. Pretreatment shall be as recommended by the equipment manufacturer.
 3. **Specifications** for the proposed equipment, certified under ANSI/NSF 61 Health Effects for use in drinking water treatment. Installation shall be in accordance with the manufacturer’s specifications.
 4. **Operational & Maintenance Plan**, including the name of a New Hampshire certified operator, contractor, or owner representative responsible for performing regular maintenance of the equipment. Minimum operational controls shall be as outlined below for disinfection options.

Disinfection for total coliform will be conditioned upon **monthly compliance sampling for bacteria**. Approval may be **rescinded** if bacteria violations persist despite the installation of disinfection, and the system may be required to provide additional treatment or develop an alternative water source.

For very small public water systems, disinfection for **total coliform** generally consists of chlorination or UV light. For *E.coli*, chlorine or ozone may be approved, but NOT UV, due to the requirements of the Groundwater Rule. General operating parameters for these disinfectants are provided below.

Description	Disinfection for TOTAL COLIFORM		Disinfection for <i>E.coli</i> (4-log virus disinfection)
	Chlorination	UV Light	
Capital cost (2009 dollars)	\$1,500 - \$3,000	\$300 to \$3,000	Site specific
O&M costs (not including labor)	<\$100 / yr chlorine stock	1/yr lamp replacement \$100 - 200 electricity equivalent to a 40W bulb	
Maintenance checks	- Daily check - Tank refill as needed	- Daily check - Annual lamp replacement	- Daily residual recording at peak flow conditions at or before 1 st customer - Chemical feed interlock with well pump operation
Minimum control requirements	Chemical feed interlock with well pump operation	- Lamp on/off indicator - Audible alarm - Run time clock - Lamp replacement light	
State reporting	Monthly bacteria samples for the life of the treatment system		- Monthly reporting of daily chlorine residuals - Monthly samples - Any loss of residual for more than 4 hours

ADDITIONAL INFORMATION

DES Drinking Water and Groundwater Bureau, on-line at www.des.nh.gov; or contact (603) 271-2513, dwgbinfo@des.nh.gov. For additional drinking water fact sheets, go to <http://des.nh.gov/organization/commissioner/pip/factsheets/dwgb/index.htm>.