

# 2008 Water Quality Report

## Berea Municipal Utilities

PWS ID: KY0760030

Berea Municipal Utilities is pleased to provide you with a copy of our annual Water Quality Report. This report provides information about the quality of water offered for use by Berea Municipal Utilities during calendar year 2008.

### What is the source of our water?

Berea Municipal Utilities treats surface water from four reservoirs, Upper Silver Creek, Lower Silver Creek, Cowbell and Owsley Fork Lakes. The final source water assessment for our system has been completed and is contained in the Madison County Source Water Assessment & Protection Plan. An analysis of the susceptibility of the Berea water supply to contamination indicates that susceptibility is generally moderate. However, there are some areas of high concern within the protection zones of the Upper and Lower Silver Creek reservoirs, as well as with the protection zone of Cowbell Lake. Forested areas within these protection zones hold the potential to generate runoff that could carry natural contaminants from the forest floor. Within the protection zone for Owsley Fork reservoir, forest areas are also present and are noted as a significant contamination threat to this source. Segments of four major roads (KY 2004, KY 3447, US 421, and KY 21) also occur within this protection zone--each perceived as medium-level threats to the reservoir supply. A copy of the plan is available for review at the Berea Municipal Utilities office, during normal business hours.

### What type of contaminants can be found in an untreated water supply?

The sources of drinking water, both tap water and bottled water, include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally-occurring minerals and, in some cases, radioactive material, and may pick up substances resulting from the presence of animals or from human activity.

Contaminants that may be present in source water include:

1. **Microbial contaminants**, such as viruses and bacteria, that may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
2. **Inorganic contaminants**, such as salts and metals that may be naturally-occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.
3. **Pesticides and herbicides**, which may come from a variety of sources such as agricultural, urban stormwater runoff, and residential uses.
4. **Organic chemical contaminants**, including synthetic and volatile organic chemicals, which are byproducts of industrial processes and petroleum production, and may also come from gas stations, urban stormwater runoff, and septic systems.
5. **Radioactive contaminants**, which may be naturally-occurring or be the result of oil and gas production and mining activities.

To ensure that tap water is safe to drink, U.S. EPA prescribes regulations that limit the amount of certain contaminants in water provided by public water systems.

U.S. FDA regulations establish limits for contaminants in bottled water that shall provide the same protection for public health.

### How is our water treated?

The water treatment plant is designed to remove or reduce the concentration of any contaminants to a safe level. The Berea Municipal Water Treatment Plant consistently produces water that meets or exceeds applicable drinking water regulations. We use a non-conventional treatment process, which includes flocculation, filtration, and disinfection. The water entering the treatment plant contains small particles that are suspended in the water, which are too light to settle out. To remove these particles, we mix chemicals with the water to form larger particles called floc. As the floc is gently mixed with the water, it collects the smaller particles and the floc grows in size. During this initial phase of the treatment process, chlorine is added to the raw water to oxidize certain compounds found naturally in the water and to disinfect the water. After flocculation has occurred, the water is routed through an adsorption clarifier, which removes the larger particles of floc. The water is then filtered through a multi-media filter to remove the remaining smaller floc particles. Then additional chemicals are added to the water to prevent corrosion in the distribution system and consumers' plumbing. As the treatment process nears completion, additional chlorine is added to protect the water from contamination prior to consumer use. Fluoride is also added to the water for dental health.

### Water Quality Data

#### Key to Abbreviations and Definitions

<b>AL</b>	=	Action level: The concentration of a contaminant, which, if exceeded, triggers treatment or other requirements which a water system must follow.
<b>TT</b>	=	Treatment Technique: A required process intended to reduce the level of a contaminant in drinking water.
<b>MCL</b>	=	Maximum Contaminant Level: The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible, using the best available treatment technology.
<b>MCLG</b>	=	Maximum Contaminant Level Goal: 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.
<b>MFL</b>	=	Million fibers per liter: the presence of asbestos fibers that are longer than 10 micrometers.
<b>ppm</b>	=	parts per million, or milligrams per liter: equivalent to 1 minute in 2 years or a single penny in \$10,000.
<b>ppb</b>	=	parts per billion, or micrograms per liter: equivalent to 1 minute in 2,000 years or single penny in \$10,000,000.

- ppt** = parts per trillion, or nanograms per liter: equivalent to 1 minute in 2,000,000 years or single penny in \$10,000,000,000.  
**ppq** = parts per quadrillion, or picograms per liter: equivalent to 1 minute in 2,000,000,000 years or single penny in \$10,000,000,000,000.  
**pCi/l** = picocuries per liter : a measure of the radioactivity in water.  
**MDL** = minimum detection limit: the smallest quantity for which a contaminant can be detected.  
**NTU** = nephelometric turbidity unit: a measure of the clarity of water.  
**N/A** = not applicable  
**MFL** = Million Fibers per Liter: a measure of the presence of asbestos fibers that are longer than 10 micrometers.  
**MRDL** = Maximum Residual Disinfectant Level: the highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminates.  
**MRDLG** = Maximum Residual Disinfectant Level Goal: the level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.  
**PH** = measurement of both acidity and alkalinity on a scale of 0 to 14 with 7 representing neutrality, numbers less than 7 increasing acidity, and numbers greater than 7 increasing alkalinity.  
**BDL** = laboratory analysis indicates that the contaminant is not present.  
**mrem/yr** = measure of radiation absorbed by the body.  
**V&E** = Variance or exception - State or EPA permission not to meet an MCL or a treatment technique under certain conditions.

The data presented in this report are from the most recent testing done in accordance with administrative regulations in 401 KAR Chapter 8. As authorized and approved by EPA, the State has reduced monitoring requirements for certain contaminants to less often than once per year because the concentrations of these contaminants are not expected to vary significantly from year to year. Some of the data in this table, though representative, may be more than one year old. Unless otherwise noted, the report level is the highest level detected.

	Allowable Levels		Highest Single Measurement	Lowest Monthly %	Violation	Likely Source	
Turbidity (NTU) TT * Representative samples of filtered water	No more than 1 NTU* Less than 0.3 NTU in 95% of monthly samples		0.25	100	No	Soil runoff	
<b>Regulated Contaminant Test Results</b>							
Contaminant [code] (units)	MCL	MCLG	Report Level	Range of Detection	Date of Sample	Violation	Likely Source of Contamination
<b>Radioactive Contaminants</b>							
Alpha emitters [4000] (pCi/L)	15	0	0.70	0.7 to 0.7	Jul-08	No	Erosion of natural deposits
Combined radium (pCi/L)	5	0	0.50	0.5 to 0.5	Jul-08	No	Erosion of natural deposits
<b>Inorganic Contaminants</b>							
Barium [1010] (ppm)	2	2	0.012	0.012 to 0.012	Feb-08	No	Drilling wastes; metal refineries; erosion of natural deposits
Copper [1022] (ppm) sites exceeding action level 0	AL = 1.3	1.3	0.169 (90 <sup>th</sup> percentile)	0.005 to 0.647	Jul-06	No	Corrosion of household plumbing systems
Fluoride [1025] (ppm)	4	4	1.02	0.79 to 1.52	Jan 2008	No	Water additive which promotes strong teeth
Lead [1030] (ppb) sites exceeding action level 0	AL = 15	0	1 (90 <sup>th</sup> percentile)	0 to 13	Jul-06	No	Corrosion of household plumbing systems
Nitrate [1040] (ppm)	10	10	0.133	0.133 to 0.133	May-08	No	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits
<b>Disinfectants/Disinfection Byproducts and Precursors</b>							
Total Organic Carbon (ppm) (measured as ppm, but reported as a ratio)	TT*	N/A	0.82 (lowest average)	0.15 to 1.36 (monthly ratios)	N/A	<b>Yes</b>	Naturally present in environment.

\*Monthly ratio is the % TOC removal achieved to the % TOC removal required. Annual average of the monthly ratios must be 1.00 or greater for compliance.

Chloramines (ppm)	MRDL = 4	MRDLG = 4	1.40 (highest average)	1 to 1.6	N/A		Water additive used to control microbes.
Chlorine (ppm)	MRDL = 4	MRDLG = 4	1.40 (highest average)	0.5 to 1.6	N/A	No	Water additive used to control microbes.
HAA (ppb) (all sites) [Haloacetic acids]	60	N/A	51 (system average)	16 to 108 (range of system sites)	N/A	No	Byproduct of drinking water disinfection
HAA (ppb) (IDSE) [Haloacetic acids]	IDSE (individual distribution system evaluation) is a study to determine future individual sites.			3 to 30 (range of individual sites)	IDSE initiated Oct-08	No	Byproduct of drinking water disinfection
HAA (ppb) [Haloacetic acids] (Individual Sites)	60	N/A	54 (locational average)	16 to 108 (range of individual sites)	N/A	No	Byproduct of drinking water disinfection
TTHM (ppb) (IDSE) [total trihalomethanes]	IDSE (individual distribution system evaluation) is a study to determine future individual sites.			31 to 52 (range of individual sites)	IDSE initiated Oct-08	No	Byproduct of drinking water disinfection
TTHM (ppb) (all sites) [total trihalomethanes]	80	N/A	61 (system average)	31 to 80 (range of system sites)	N/A	No	Byproduct of drinking water disinfection.
TTHM (ppb) [total trihalomethanes] (Individual Sites)	80	N/A	62.5 (locational average)	31 to 80 (range of individual sites)	N/A	No	Byproduct of drinking water disinfection.

**Turbidity:** 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. Turbidity is a measure of treatment performance and is regulated as a treatment technique. Turbidity is measured in nephelometric turbidity units (NTU), and is a measure of the clarity of water. Turbidity in excess of 5 NTU is noticeable by the average person. We are pleased to report that none of our turbidity samples exceeded the 0.3 NTU allowable levels, (the highest turbidity measurement during the year was 0.25 NTU).

MCL's are set at very stringent levels. To understand the possible health effects described for many regulated constituents, a person would have to drink 2 liters of water every day for a lifetime at the MCL level to have a one-in-a-million chance of having the described health effect.

In 2004 through 2006, BMU worked with McCoy & McCoy Laboratories, Inc. in their efforts to become certified to analyze water samples for Cryptosporidium and Giardia. BMU provided water samples for analysis. No Cryptosporidium or Giardia were found in the test samples. Cryptosporidium is a microbial parasite, which is found in surface water throughout the United States. These parasites can cause symptoms such as nausea, cramps, diarrhea, and associated headaches.

### Monitoring and Reporting Violations

We received a Compliance Determination in that we failed to perform public notification in accordance with 401 KAR 8:070. The public notification must not contain language that contradicts or detracts from the standard mandatory language or the purpose of the notice. Details specifying the nature of the violation are: "Incorrect PWSID# on PN Certification. Listed as KY760030. Should have been KY0760030. Missing good faith effort on Certification Form." These items have been corrected as of this report.

### General and Health Information

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects may be obtained by calling the Environmental Protection Agency's Safe Drinking Water Hotline at 800-426-4791.

**"Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants are available from the Safe Drinking Water Hotline (800-426-4791)."**

The nitrate level in our drinking water during this reporting period was 0.133 ppm. Nitrate in drinking water at levels above 10 ppm presents a health risk for infants of less than six months of age. High nitrate levels in drinking water can cause blue baby syndrome. Nitrate levels may rise quickly for short periods of time due to rainfall or agricultural activity. If you are caring for an infant, you should ask advice from your health care provider.

Infants and young children are typically more vulnerable to lead in drinking water than the general population. It is possible that lead levels at your home may be higher than at other homes in the community as a result of materials used in your home's plumbing. If you are concerned about elevated lead levels in your home's water, you may wish to have your water tested and flush your tap for 30 seconds to 2 minutes before using tap water. Additional information is available from the Safe Drinking Water Hotline, 800-426-4791 or at <http://www.epa.gov/safewater/lead>.

### **Water Plant Upgrade Project**

In 2008 we failed to meet the removal ratio for Total Organic Carbon (TOC). The required treatment technique ratio is 1 or above. For the monitoring period January 2008 through December 2008, the reported ratio for TOC was 0.82. In March 2005, we requested that the Drinking Water Branch of the Division of Water review the TOC removal requirement in relation to our treatment process. Based on this review, we were granted an exemption from the TOC removal requirement while we pursue other treatment options. We have completed a pilot study using a process called Dissolved Air Flotation (DAF). This is a process to assist in the removal of TOC from the water before it goes through the filters. Our engineers have finished the final design for the plant upgrade. We have signed a contract with W. Rogers Construction Company to perform the upgrade and construction is under way. Construction should be completed in approximately sixteen months. As the project progresses, we will periodically be required to shut down the water treatment plant for installation of new equipment and making new connections in the treatment system. During those periods, we will not be producing water; therefore, we request that you begin a program of water conservation in your home and/or business to help us through those times. We thank you for your cooperation.

### **Remember the drought of 2007**

In 2007, we had an extremely dry summer and fall. The water levels in our reservoirs were the lowest that we had seen in years. At that time we had to impose water use restrictions on our customers in order to stretch our supply of water. You responded wonderfully. In the summer of 2008 we had a similar situation. Due to your continuing conservation efforts, we did not have to impose any water use restrictions. As we approach the summer of 2009, we need to remember those dry times and continue our conservation efforts. Collect rain water to water your plants. Limit your lawn watering to early in the morning or later in the evening to reduce evaporation. Check your faucets and toilets for leaks. Again, thank you for helping to conserve our water supply.

Berea Municipal Utilities is a publicly owned utility company governed by the Berea City Council. BMU does not hold regular board meetings which would provide our customers with the opportunity to participate in decisions affecting the quality of water. However, if you have questions or concerns about the information contained in this report or are concerned about the quality of your water please contact a Berea Municipal Utilities team member by calling:

Berea Municipal Utilities

Phone: (859) 986-4391

**Spanish (Español)** Este informe contiene información muy importante sobre la calidad de su agua beber. Tradúzcalo o hable con alguien que lo entienda bien.