FAQs & Answers about Total THM Exceedances

Town of Bethlehem Department of Public Works

(Updated March 2019)

The Town of Bethlehem Department of Public Works recently notified customers of our public water system that our drinking water exceeded the Locational Running Annual Average standards for Total Trihalomethanes (THMs) at one of our four sampling locations based on analysis of four quarterly routine water samples collected by the Town during 2018 and 2019. This document has been prepared to assist our customers with some common questions about THMs, drinking water standards, and operation of our public water system.

Why did the Town issue the public notice?

All public water systems are required by state and federal law to notify users of exceedances of any water quality standard and any other noncompliance events affecting their water system. The regulations require public notification to be repeated very three months until our public water system is in compliance with the standard.

Beyond that, we feel it is important for you to know about your water.

YOUR WATER: Sources, Treatment, & Delivery

Where does our drinking water come from?

Each year, the Town of Bethlehem delivers approximately 1.6 billion gallons of clean drinking water to more than 11,600 homes and businesses through 227 miles of pipes.

Our water comes from four major sources: the Vly Creek Reservoir and New Scotland Wellfield, the Selkirk Wellfield, and the Albany Aqueduct.

Water from the Vly Creek Reservoir and New Scotland Wellfield are treated at our New Salem Water Treatment Plant in the Town of New Scotland, while water from the Selkirk Wellfield is treated at our Clapper Road Water Treatment Plant in the Town of Bethlehem. Water purchased from the City of Albany comes from the Alcove Reservoir in the Town of Coeymans and is treated prior to delivery via the Albany Aqueduct.

How do we treat our water?

In general, "treating" our water involves clarification, filtration, and disinfection. During clarification, we add a coagulant to the raw water that helps settle out particulates. We next remove smaller particulates through filtration. The clean water is then disinfected and pumped into the distribution system.

Disinfectants are essential elements of drinking water treatment because they protect against waterborne disease-causing microorganisms. The practice of disinfection has nearly eliminated most acute waterborne diseases such as typhoid fever and cholera in the United States. It is also important for keeping local diseases like giardia and cryptosporidium out of our water supply.

In addition to using chlorine in our treatment plants, we also keep a small amount of chlorine in our water throughout its journey from the treatment plants to our homes and businesses to prevent the growth of microorganisms and protect against contamination from an outside source, such as during a water main break.

Water from the Selkirk Wellfield is also pretreated with chlorine at the Clapper Road Water Treatment Plant to remove naturally occurring iron and manganese. Because of differences in the source waters, this step is not needed with water at our New Salem Water Treatment Plant.

MONITORING: Tracking More than 90 Risks to Ensure Safety

What monitoring does the Town do and why?

The Town follows strict EPA and NYS Dept. of Health schedules for monitoring our water supply for more than 90 potential contaminants. The tests allow us to see if our water supply is below the Maximum Contaminant Levels (MCLs) set by the EPA to protect human health using the best available technologies.

To date, the Town has met the federal standards for all contaminants except one – Total THMs– which is one too many.

In addition to the regulated contaminants, we voluntarily monitor our water system for other contaminants that affect aesthetic considerations like taste, color, and odor. The EPA does not consider these secondary contaminants to be risks to human health at the recommended secondary maximum levels.

Finally, in 2013 the Town tested our water system for 21 additional contaminants of concern like PFOA, PFOS, and 1,4-dioxane. Happily, all tests results were negative.

Where does the Town monitor for Total THMs?

All public water systems that use chlorine for disinfection are required by federal and state law to sample for Total THMs on a quarterly basis (once every three months) at several locations in the distribution system. For Bethlehem, the NYS Dept. of Health selected four locations that are most likely to have compliance challenges and represent the entire Town water distribution system:

- 668 Wemple Road (Selkirk)
- 445 Delaware Avenue (Delmar)
- 205 McCormack Road N (Slingerlands)
- 37 Beldale Road (North Bethlehem)

What is are Maximum Compliance Levels (MCLs) and how are they monitored?

Drinking water standards are set to protect against potential negative health effects from drinking water containing certain chemicals. The Maximum Contaminant Levels (MCLs) in drinking water are set so that the amount consumed does not exceed safe levels. Some MCLs address the daily amount consumed (for chemicals that pose an immediate risk), and others address the amount averaged over a long period of time (for chemicals that pose a long-term risk).

The MCL for Total THMs was set at a level to balance the immediate risk of bacterial contamination with the long-term risk of health effects such as cancer. The EPA and NYS Dept. of Health have set an MCL for Total THMs of 80 parts per billion (ppb) as an annual average.

Federal and state regulations require the Town to sample our four monitoring locations every three months, including the month of warmest water temperature. The average of each sampling location is then calculated each quarter over the last 12-month period, and these individual site averages (Locational Running Annual Averages, or LRAAs) are compared to the standard to determine whether the system is in compliance. As of Quarter 1, 2019, the highest Locational Running Annual Average reported for Total THMs was 96.9 ppb at the Wemple Road sampling location.

The Violation & Solutions

What happened that caused the Town to issue the public notice?

Prior to 2013, our water system was required to meet the Total THM standard of 80 parts per billion (ppb) based on the running annual average of the entire system. And we did.

In 2013, EPA introduced the Stage 2 Disinfectant and Disinfection Byproduct Rule which kept the same standards, but required compliance at each of the individual monitoring stations. Unfortunately, we have failed to meet the Total THM standard at one of our sampling stations (Wemple Road, near River Road, in Selkirk). High Total THM levels are usually associated with water that has aged too much in the distribution system, like at the dead ends of water mains.

The Wemple Road sampling site is at a dead end water main with very little water usage before it. In an attempt to reduce the Total THMs at this site, we installed an automatic flushing station that pumps water out of the main for an hour every day. We also installed a new section of pipeline along River Road, from Wemple Road to a point north of Smultz Road, which significantly reduced the length of dead end water main on Wemple Road.

These two improvements have resulted in a significant reduction in water age at the Wemple Road sampling site. Associated with the reduction in the water's age, the chlorine residual in the water is now higher. This is desirable because the chlorine acts as the primary means of disinfection for our drinking water and protects all of us from waterborne pathogens (like giardia and cryptosporidium).

Please note that the vast majority of the Town's water is well below federal and state limits, and when improvements are completed at our Clapper Road Water Treatment Plant, all of the Town's water should be well within the standards.

How is the Town of Bethlehem correcting the situation?

The Town has been diligently working on this issue for the better part of the past decade, and many improvements have already been made to reduce the amount of disinfection byproducts in our water system. These improvements include the following:

- Unification of the Town's water distribution system and new baseline water-quality testing (completed in 2011);
- Construction of process improvements at the New Salem Water Treatment Plant (completed in 2013);
- Installation of a new flushing station to reduce water age at the Wemple Road dead end (completed 2016);
- Installation of new water lines to connect existing lines and eliminate or reduce dead end water mains (ongoing); and
- Minimizing the amount of chlorine added to our water (see below – completion scheduled for 2020).

This winter, we broke ground on the construction of a new pre-treatment facility at the Clapper Road Water Treatment Plant. This $18 million project will allow us to stop using chlorine to remove naturally occurring iron and manganese from water from the Selkirk Wellfield. By using other chemicals to oxidize the metals, we can wait to add chlorine until after the water has been filtered, thus significantly reducing the amount of disinfection byproducts that may form in our water distribution system. This vital project is scheduled to be completed in Fall 2020.

The EPA, NYS Dept. of Health, and Albany County Health Dept.
have all declared Bethlehem's water safe to drink for now,
but the Town is working closely with these agencies
to ensure our water is safe to drink over our lifetimes.

The Contaminants

What are trihalomethanes?

Trihalomethanes (THMs) are a group of four chemical compounds known as disinfection byproducts. They form when naturally-occurring organic matter in the water reacts with the chlorine we use to disinfect our drinking water. They are colorless and some of the compounds will evaporate out of the water into the air. Trihalomethanes are always present, at some level, in chlorinated drinking water. Regulatory compliance is based on the total concentration of all four THM compounds, which is called Total Trihalomethanes. Levels of Total THMs generally increase in the summer months due to warmer temperatures, but can also be affected by seasonal changes in source water quality or by changing the amount of disinfection chemicals that are added to the water.

What are the health risks of THMs?

Health studies suggest a possible connection between long-term Total THM exposure and certain types of cancer (e.g., bladder, colon, and rectal) and developmental and reproductive effects (e.g., fetal growth, miscarriages, stillbirths).

More research is being conducted to better understand the connections between Total THM exposures and these health risks. Cancer risks generally accrue over lifetimes and very long periods of exposure. For disinfectant byproducts like THMs, risks are typically calculated with a daily average of drinking 2 liters of water over a lifetime of 70 years.

In general, young children may be more susceptible to the effects of chemicals because their ability to metabolize chemicals is not mature and their exposures may be greater for their size than in adults. Women of childbearing age and pregnant women may be also more susceptible to effects from THM exposure

To reduce this risk, these groups may wish to act with caution and reduce their exposures by following the recommendations in the next section.

What You Can Do

Where can I get more information on health risks?

Additional information on the health effects of disinfection byproducts is available on the following websites:

- http://www.cdc.gov/safewater/chlorination-byproducts.html
- http://www.epa.gov/dwreginfo/stage-1-and-stage-2-disinfectants-and-disinfection-byproducts-rules

What can be done to reduce exposure to THMs while permanent solutions are underway?

If you are concerned about THMs and want to reduce your exposure, you can:

- Use bottled water; or
- Use certified filters (pour-through pitchers, faucet mounts, or plumbed household units).

Filters should be certified by the National Sanitation Foundation, Underwriters Laboratories, or Water Quality Association to remove THMs (products certified for volatile organic chemicals (VOC) will work on THMs). Pitcher-style filters are widely available at kitchen and bath stores and hardware stores. Filters should be regularly changed according to manufacturer instructions.

The following websites have useful information on filters.

- www.nsf.org/certified/dwtu/
- www.waterfiltercomparisons.com/water_filter_comparison.php?d=gp
- www.waterfiltercomparisons.com/shower_filter_comparison.php
- www.waterfiltercomparisons.com/whole_house_filter_comparison.php
- www.epa.gov/sites/production/files/2015-11/documents/2005_11_17_faq_fs_healthseries_filtration.pdf

Where to Get More Information

Who should I contact with questions or concerns about health risks?

If you have health questions about THMs in our drinking water, please contact:

Dr. Tom Brady
Assistant Director of Environmental Health
Albany County Health Department
(518) 447-4620
Thomas.Brady@albanycountyny.gov

Who should I contact for more information about Bethlehem's water system?

We are happy to answer any questions you may have about our water, water system, monitoring, and construction projects. Please contact:

George Kansas, P.E.
Commissioner of Public Works
Town of Bethlehem
(518) 439-4955 option 4
gkansas@townofbethlehem.org