

# The Summertime THM Blues

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**A**hhh.....Summertime! Hot sunny days, hot dogs, baseball, swimming, camping, picnics, parades, cold beer and ...Trihalomethanes?

Yes, it's that season again when we encounter the "warmest month of the year" and have to sample for disinfection by-products. Many of us with small groundwater systems

may be sampling for these contaminants for the very first time this summer. So lets review some of the EPA regulations and requirements for small groundwater systems (not under the direct influence of surface water) only:

The Stage 1 Disinfectant and Disinfection By-product Rule (D/DBPR), updates and supersedes the 1979 regulations for total trihalomethanes. It increases the monitoring requirements for disinfection chemicals and disinfection by-products. In addition, it's aim is to optimize disinfection processes, while reducing the risks associated with exposure to disinfection by-products.

The D/DBPR establishes maximum residual disinfectant levels (MRDLs) for three chemical disinfectants chlorine (4.0 mg/l), chloramines (4.0 mg/l) and chlorine dioxide (0.8 mg/l). It also establishes maximum contaminant levels (MCLs) for total trihalomethanes (0.08 mg/l), haloacetic acids (0.06 mg/l), chlorite (1.0 mg/l) and bromate (0.01 mg/l).

The D/DBPR covers a large number of public water systems. It applies to all community water systems (CWS) and nontransient noncommunity water systems (NTNCWSs), regardless of size, which add a chemical disinfectant to the water in any part of the drinking water treatment process.

As the operator of a small groundwater system, serving less than 10,000 people, what do you have to do to comply with this rule?

First, you must determine your sampling/monitoring frequency. Your sampling frequency is dependent on your system's source water, and the number of people served by that system. For groundwater systems serving <10,000 people, the sampling frequency for THMs and HAA5s is, one sample, per plant, per year, in the month of warmest temperature. (August is usually the warmest month).

Next, you have to develop and implement a written monitoring plan. Your monitoring plan should include:

1. The water system name, address, PWS ID#, number of customers served and the source.
2. The date(s) on which you will be sampling.

3. The exact location(s) where you will be sampling from. \*
- \*Your THM & HAA5 sample location must be in the distribution system at a location representing the maximum residence time (MRT) or "oldest water".
- \*Your chlorine samples should be taken at the same frequencies, times and locations as your total coliform samples.
4. A map or sketch of your distribution system showing your sample locations.
5. The name, address, and phone number of the ELAP approved analytical laboratory that will be analyzing your samples. (A list of certified commercial labs can be found on the ELAP website:  
<http://www.wadsworth.org/labcert/elap/elap.html>)
6. Procedures for calculating compliance with MCLs and MRDLs.

Those systems serving >3,300 people, must submit their monitoring plans to DOH for review and approval. For systems serving <3,300 people, monitoring plans must be made available for review by the DOH and the public.

Now that you have developed a monitoring plan, and August is here, it's time to sample for THMs and HAA5s. Collect your samples carefully. Because of the high sensitivity of the instrumentation used in this analysis and the low concentrations of the organic compounds being analyzed, special attention should be used in collecting any volatile organic chemical (VOC) samples. It's always a good idea to consult with your lab before collecting these samples. The lab may have special requirements for collection, preservation, storage and transportation of your samples. Also, be aware that most analytical labs will be busy this summer with the increased monitoring and analysis. Check with them first as to when they can best accept your samples, (time of day, day of the week, week of month), for a speedy turn around of your results.

THM and HAA5 samples are usually collected in 40 ml glass vials with Teflon septums. Most labs will send you 3 vials. One vial will already be filled with a known "clean" sample at the lab, it is known as a "trip blank". The trip blank serves as an indicator of any contamination that may occur during sample transport or storage. Therefore, this vial must not be opened and must always travel with the other samples. The other two vials should contain a small amount of sodium thiosulfate to quench any residual chlorine in the sample. Do not rinse the vials or lose the sodium thiosulfate. The vials and caps are sent to you pre-assembled, with the two-part

Teflon/silicone rubber septum oriented in the proper direction. The Teflon side of the septum must face the water in the vial.

THM and/or VOC samples must be taken at a cold water tap, with all screens, filters, aerators, etc. removed. Let the water run long enough to clear all water that has been standing in the lines (usually 3-5 minutes). The samples can be either collected directly from a tap or by pouring a sample from a clean and well rinsed beaker. While wearing clean gloves, fill the two vials from the same source, at the same time and under the same conditions. Gently fill the vials until the water forms a slight dome over the top of the vial. Once they are full, you will need to add a few drops of acid (HCL) to lower the sample pH to  $<2$ , in order to preserve the sample. (Your lab will usually provide you with the HCL, a small dropper, and instructions for collecting and preserving the samples). Once you have added the HCL preservative, carefully replace the septum cap on each vial and tighten with care.

Check for air in the sample by inverting the vial several times and looking to see if any air bubbles are present. A good sample should contain no entrained air bubbles at all. Rinse off the outside of each vial and dry. Label each vial with the date, system name, and sample ID# as shown in your sampling/monitoring plan. Use tape and a pen with permanent ink.

Once your samples have been collected and labeled, it is also a good idea to place each sample "set" in its own zip-lock bag. Place all of the samples in a cooler with ice packs or in a refrigerator until transporting them to the lab. Make sure that you completely fill out all of the chain of custody forms sent to you from the lab, and keep a copy for your files. Whether your lab picks up the samples, you drop them off, or you ship your samples overnight, you must keep them as close to 4° Celsius (~39°F) as possible. The sample holding time for THMs is only 14 days at 4° C, so get your samples to the lab ASAP.

For more information on the D/DBPR and its requirements, the EPA publishes a helpful document titled "The Stage 1 Disinfectant and Disinfection Byproduct Rule: What does it mean to you?" (document # EPA 816-R-01-014). EPA also has a few D/DBPR Quick Reference Guides, (EPA 816-F-01-010 & EPA 816-F-02-021), that are also good, simple references. All of these documents are free and downloadable from the EPA web site at [www.epa.gov/safewater](http://www.epa.gov/safewater), or you can order them by calling The National Service Center for Environmental Publications (NSCEP) at 1-800-490-9198.

Now that you have developed a sampling/monitoring plan, collected your samples properly (at the right location, during the right time of year), send them to the lab (properly labeled and on ice, with all of the chain of custody paperwork filled out), it's time to relax and enjoy summer again! At least

until the analytical results come back. But that will be the focus of my next article, what to do with the results and how to report them. Until then, sit back and try draining a few 12oz. brown bottles while enjoying the rest of the summer. And don't forget your cooler! ♡

