



# Most Small Public Water Supplies Required to Develop Stage 2 DBPR Compliance Monitoring Plan by October 1, 2013

**D**isinfection is required to ensure water produced by public water systems is safe to drink and to inactivate disease-causing microbial organisms. For most small water systems in Kansas, the preferred method of disinfection is chlorination. Unfortunately, chlorine also readily reacts with naturally occurring organics found in all source water. The result is disinfection byproducts. While these organics, also called precursors, are found in all types of source water, they are more prevalent in surface water than groundwater. Scientific research has shown that some individuals who drink water containing high levels of disinfection byproducts can experience liver, kidney or central nervous system problems. There could also be an increased occurrence of cancer. However such problems present themselves only after drinking such water over a period of many years.

Consequently, EPA developed two federal rules regulating disinfection byproducts. The Stage 1 Disinfectants and Disinfection Byproducts Rule (Stage 1 DBPR) establishes maximum contaminant levels (MCLs) for two of the more commonly found byproducts: total trihalomethanes (TTHM) and haloacetic acids (HAA5). As of January 2004, all public water systems that add a chemical disinfectant such as chlorine were required to begin complying with MCLs for both byproducts. The MCL established for TTHM is 80 ppb (0.080 mg/L). The MCL for HAA5 is 60 ppb (0.060 mg/L). Compliance with these two MCLs is based on a running annual arithmetic average.

Then in January 2006, EPA finalized the Stage 2 Disinfectants and Disinfection Byproducts Rule (Stage 2 DBPR). Stage 2 is an extension of the Stage 1 Rule, but with some changes and additional requirements. Water systems must continue to comply with all requirements of the Stage 1 Rule in addition to meeting new Stage 2 requirements. These new Stage 2 changes and requirements include:

- ◆ Conducting an Initial Distribution System Evaluation (IDSE) in order to find those locations in the distribution system with the highest levels of TTHM and HAA5. These locations can then be used as future Stage 2 compliance monitoring sites. Some water systems were given exemptions from this requirement, which will be discussed in more detail later.
- ◆ Begin calculating compliance with both respective MCLs based on locational running annual averages (LRAA). The key word here is “locational.” Compliance is now based on a running annual average calculated at each monitoring location.
- ◆ Begin compliance monitoring at the number of locations required by the Stage 2 Rule. Generally, the number of compliance samples required increases based on population served and source type (surface water requires more monitoring locations than groundwater). Frequency of monitoring is also established (quarterly or annually).
- ◆ If monitoring indicates that MCLs are exceeded, the water system must then examine their source water, operational practices and treatment to identify ways to reduce TTHM and HAA5 levels in the distribution system.

The purpose of this article is to alert small water systems that a Stage 2 compliance monitoring plan must be developed. KDHE requests that plans be submitted no later

than October 1, 2013. For purposes of this rule, EPA divides small systems into two categories based on population: Schedule 3 systems which serve 10,000 to 49,999 people and Schedule 4 systems which serve less than 10,000 people. Unfortunately, this issue becomes confusing because some small water systems have already completed an IDSE report, which

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**Table 1: Standard Monitoring Compliance Dates (IDSE monitoring)**

If you are a water system serving:	Schedule:	Standard Monitoring Plan Due Date:	Complete Standard Monitoring by:	Submit IDSE Report by:	Begin Compliance Monitoring by:
At least 100,000 people or part of a combined distribution system serving at least 100,000 people	Schedule 1 <sup>1</sup>	October 1, 2006	September 30, 2008	January 1, 2009	April 1, 2012
50,000 to 99,999 people or part of a combined distribution system serving 50,000 to 99,999 people	Schedule 2	April 1, 2007	March 31, 2009	July 1, 2009	October 1, 2012
10,000 to 49,999 people or part of a combined distribution system serving 10,000 to 49,999 people	Schedule 3	October 1, 2007	September 30, 2009	January 1, 2010	October 1, 2013
Less than 10,000 or part of a combined distribution system serving less than 10,000	Schedule 4	April 1, 2008	March 31, 2010	July 1, 2010	October 1, 2013

<sup>1</sup> Each system's schedule is defined by the largest system in the combined distribution system

includes a Stage 2 compliance monitoring plan. Those small systems that already have an IDSE report/Stage 2 monitoring plan are generally those that purchase water from larger water systems such as Lawrence, Topeka, Kansas City BPU, Olathe and Johnson County WaterOne. These systems are defined by EPA as Schedule 1 (serving more than 100,000 people) or Schedule 2 (serving 50,000 to 99,999 people) systems. And if the small system, regardless of number of people served, purchases water from any of these large systems, then the small system is also considered a Schedule 1 or 2 system because it is part of a “combined distribution system” served by a large water supply that is a Schedule 1 or 2 system. See Table 1. For example, if a water system serves 8,000 people but it purchases water from a system that serves 250,000 people, the smaller system had to comply by the dates shown in Table 1 for Schedule 1 systems. However in this same example, if the water system serving 8,000 people does not purchase from any other systems, it would be considered a Schedule 4 system, required to comply with dates found in Table 1.

Fortunately, there is another much easier way to determine whether or not a small system still needs to develop a Stage 2 compliance monitoring plan. Because the KDHE lab was not able to run all of the samples necessary to help systems prepare IDSE/Stage 2 compliance monitoring plans, all of the aforementioned large systems and those water supplies that purchase from them were required to use private laboratories for IDSE testing. So, if a water system contracted with a private laboratory to

analyze TTHM and HAA5 samples approximately three to four years ago, that system should already have an IDSE Report, and thus a Stage 2 compliance monitoring plan. That plan should have been submitted to EPA Region 7 in Lenexa, Kansas.

If a system was not required to use a private laboratory recently to analyze TTHM and HAA5 samples, then most likely that system is considered a Schedule 3 (serving 10,000 to 49,999 people) or Schedule 4 (serving less than 10,000 people) and were exempt from IDSE monitoring. In 2006, many of the small water systems received either a “Very Small System Waiver (VSS)” or a “40/30 Certification.” The VSS Waiver was issued to all small water systems serving less than 500 people that had existing TTHM and HAA5 data under Stage 1. The 40/30

**Stage 2 Disinfection Byproducts Rule:  
Upcoming Workshops Scheduled by KRWA and KDHE**

Dates	Facility, Location	
April 16, 17, 18	Prairie Band Conference Center	Mayetta
May 14, 15	Kingman County Activities Center	Kingman
May 21, 22, 23	Bicentennial Center	Salina
June 4, 5, 6	North Community Building	Iola
June 18, 19	Magourik Conference Center	Dodge City
July 16, 17	Sternberg Museum	Hays

Note: The same information will be presented on each of the dates. Those attending should only register for one of the dates listed. Attendance is limited so register early. Multiple days are scheduled to accommodate the hundreds of systems that need to comply with this Rule. All water systems must complete their Stage 2 monitoring plans by October 1, 2013. KRWA and KDHE will provide one-on-one assistance at each training session to complete each system's plan.

Certification was issued to all systems that had low historic TTHM and HAA5 levels. Systems were eligible for this certification if all Stage 1 data confirmed results less than 40 ppb (TTHM) and 30 ppb (HAA5). Note these levels are exactly half of the respective MCLs for both byproducts. **So if a system was granted either of these exemptions, then that system will still need to develop a Stage 2 compliance monitoring plan by October 1.** There are more than 700 public water supplies that fall into either the Schedule 3 or Schedule 4 group; all need to have a monitoring plan by October 1, 2013.

The monitoring plans for these systems should be developed based on location(s)

**Table 2: Stage 2 DBPR Compliance Monitoring Requirements (Number of samples or locations required and frequency)**

Source Water Type	Population Served	Monitoring Frequency for TTHMs and HAA5s at each location	Number of Distribution System Samples or Locations
Subpart H (Surface Water or Groundwater Under the Influence)	Less than 500	per year*	2 samples
	500 – 3,300	per quarter *	2 samples
	3,301 – 9,999	per quarter	2 locations
	10,000 – 49,999	per quarter	4 locations
	50,000 – 249,999	per quarter	8 locations
Groundwater	Less than 500	per year*	2 samples
	500-9,999	per year*	2 samples
	10,000 – 99,999	per quarter	4 locations

\* These systems are required to take individual TTHM and HAA5 samples (instead of a dual sample set) at the locations with the highest TTHM and HAA5 concentrations, respectively. Only one location with a dual sample set per monitoring period is needed if the highest TTHM and HAA5 concentrations occur at the same monitoring location and month, when monitoring annually.

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where chlorine is added, type chlorine used (free vs. combined), location of storage facilities and extent of distribution system. Other data that can be used to find the points of highest TTHM and HAA5 concentrations include past Stage 1 data and daily chlorine residual

logs. But in general, the point where theoretically the TTHM and HAA5 levels will be the highest when using free chlorine, will be that point in the distribution system with the longest residence time. In short, that point in the system where water has been in the distribution system the longest period of time. This is usually a point farthest away from the point of chlorine addition. As a general rule, disinfection byproducts increase in concentration as free chlorine contact time and temperature increase.

If using combined chlorine, the highest TTHM location will also be the point in the system with the longest residence time. However, research indicates that HAA5 levels can actually decrease as combined chlorine contact time increases due to biodegradation. Research suggests that when combined chlorine is present, HAA5 compounds form and then decompose. Biodegradation occurs because microorganisms consume HAA5. And this is especially true if combined residuals are low or non-existent and during warm, summer months when the temperature of source water and water standing in storage tanks can increase



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dramatically. Consequently, the site with highest HAA5 levels when using combined chlorine will probably not be the site with the longest residence time. It may actually be a site with a much shorter residence time.

With the cooperation of KDHE, KRWA will present fifteen Stage 2 workshops across the state beginning mid-April 2013. The goal of these workshops is to help each water system develop its own individual Stage 2 monitoring plan which can then be submitted to KDHE by October 1. Operators will also be eligible for five (5) hours of operator credit for attending. The format of these workshops will include a general session explaining both the benefits and requirements of the Stage 2 Rule. During these workshops, KRWA also plans to meet individually with each water system, helping develop the system-specific compliance monitoring plan. Please check the KRWA Web site training calendar for the dates and locations of the workshops; the dates and locations are also printed in the table on the previous page.

KRWA encourages each system to bring a map of their distribution system showing all points-of-entry or where chlorine is added, wells, treatment plants, booster pumping stations if rechlorination is used and storage facilities. If the system purchases water, then the location of the master meter for the wholesale supplier also needs to be located. When completed, each monitoring plan will indicate how many TTHM and HAA5 samples must be collected, where they will be collected, how often and how the locational running annual average will be calculated. See Table 2 to see what is required of each system based on source type

and population served. If the system is on quarterly monitoring, then monitoring will begin the last quarter of 2013. If the system is on annual monitoring, then monitoring will begin the summer of 2014 during the month designated as having the warmest water temperature.

I look forward to seeing many operators and managers at the upcoming Stage 2 workshops sponsored by KRWA. If I can be of assistance in the meantime, please feel free to contact me at (913) 850-8822 or email to me at [jeff@krwa.net](mailto:jeff@krwa.net). For additional help with this rule, I also suggest reviewing EPA's publication: "Complying with the Stage 2 Disinfectant and Disinfection Byproducts Rule: Small Entity Compliance Guide." It can be found on the EPA Web site.

### Annual conference is great!

I want to remind readers of the upcoming annual KRWA conference & exhibition set for Marcy 26 – 28 at Century II Convention Center in Wichita. This conference is one of the best and rivals most national conferences. Take a look at the program and make an investment by attending. I think you'll be glad you did.

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