

Federal Regulations: “Taking It To The Next Level”

(And the Accompanying Frustration, Unreasonableness, and Expense)

The phrase “Taking it to the next level” is often heard as a metaphor in commentary on sporting events. It usually means that a player will be transitioning from high school sports to college sports, or from college sports to professional sports. It can also mean transitioning from mediocre performance to a higher or improved level of performance. However, used in conjunction with the new federal regulations on public water supplies “taking it to the next level”, the results for some may not be so good.

The compliance sampling under the Stage 2 Disinfectants and Disinfection Byproduct Rule (hereafter called the Stage 2 Rule) for many small systems serving less than 10,000 persons began in late 2013 with annual sampling in 2014.

With respect to trihalomethanes (THMs) and haloacetic acids (HAAs), this article will discuss the sampling results that actual, Kansas systems have had and will show the accompanying frustration, unreasonableness, and expenses that have been incurred.

The Law

The U.S. Environmental Protection Agency (U.S. EPA) has promulgated three federal regulations requiring public water supplies (PWSs) to sample for THMs and HAAs. The nearby sidebar lists the three regulations and some important provisions of each regulation. Many provisions in the regulations did not take effect until several years later than the date of the regulation.

The detailed requirements with which PWSs must comply are not specified in the congressional passed law, the Safe Drinking Water Act, but are in the regulations written and promulgated by U.S. EPA. It is these requirements that are complex, costly, and sometimes difficult to understand.

It is interesting to note that the first regulation did not apply to PWSs serving less than 10,000 persons; the second regulation affected that segment of systems 19 years later. The reasons for that early exclusion raise questions on why smaller systems were originally excluded but were later required to comply with the regulation.

It is important to note that PWSs that purchase water and do not chlorinate water were not required to sample for THMs and HAAs until the third regulation was implemented; that regulation is known as the Stage 2 Rule.

The first sampling for THMs and HAAs by many of those small systems did not occur until the July to September quarter of 2014.

The Stage 2 Rule has recently resulted in some interesting and frustrating results for some systems. Most of the results fall into two categories of PWSs. The categories are systems that purchase water, and the systems that only sample once in the first compliance year.

Purchase from a Surface Water Supplier

There are many systems that purchase water and do not chlorinate or treat the water themselves. Some of those

Federal Regulations promulgated by U.S. EPA concerning Trihalomethanes (THMs) and Haloacetic Acids (HAAs)

November 29, 1979: Total Trihalomethanes Rule

- ◆ 44 Federal Register 68624
- ◆ 0.10 mg/L MCL for THMs
- ◆ Quarterly Compliance Monitoring
- ◆ Regulation only applies to systems treating surface or groundwater under the direct influence of surface water; and serve 10,000 persons or more

December 16, 1998: Stage 1 Disinfectants and Disinfection Byproducts Rule

- ◆ 44 Federal Register 69390
- ◆ 0.080 mg/L MCL for THMs
- ◆ 0.060 mg/L MCL for HAAs
- ◆ Monitoring schedule determined by source of water, size, and past sampling record
- ◆ Monitoring can be quarterly, or yearly, or every three years
- ◆ Regulation applies to systems that add a chemical disinfectant to the water

January 4, 2006: Stage 2 Disinfectants and Disinfection Byproducts Rule

- ◆ 44 Federal Register 338
- ◆ MCLs stay the same
- ◆ Monitoring schedule quarterly, or yearly, or every three years
- ◆ Regulation applies to all systems including purchasing systems

systems purchase water from a water supplier that has a surface water source. Surface water suppliers use combined chlorine (chlorine combined with ammonia) as a distribution system residual. The use of combined chlorine allows systems to meet the required maximum contaminant levels (MCLs) for THMs and HAAs.

Surface water suppliers sometimes during the warmer water temperature months (July – November) discontinue the use of combined chlorine and use free chlorine (chlorine without ammonia) as a distribution system residual. In these situations when free residuals are used, the THMs and HAAs are quite high and are out of compliance with required MCLs. Thus, water suppliers do not sample for THMs and HAAs when free chlorine is being used.

Actual Kansas Case 1: Purchasing Water and Stage 2 Rule

There is a rural water district we will call “RWD 1” that buys water from a city that we will refer to as “Big City”. Under the Stage 2 Rule, Big City and RWD 1 are both required to sample quarterly for THMs and HAAs in November, February, May, and August. Big City also sells water to three other RWDs and one other city.

Big City has a surface water treatment plant. Big City sampled for THMs and HAAs on August 10 and then on August 11 changed plant operation from combined chlorine residual to free chlorine residual. The change was necessary to combat nitrification and residual loss in the city’s distribution system.

The Big City collected its samples for THMs and HAAs on August 10 to avoid the much higher THMs and HAAs that would have resulted if samples had been collected when using the free chlorine residual later in the month. Big City continued the free residual from August 11 to October 10.

Comparing Big City vs. RWD 1 Sample Results

System	Date	Residual Type	THMs	HAAs
Big City	August 10, 2014	Combined	29	33
RWD 1	August 27, 2014	Free	230	130

THMs and HAAs results expressed in micrograms per liter (ug/l) (100 ug/l = 0.100 mg/l)

- Big City results are an average of four samples taken
- RWD 1 results are for one sample taken

Table 1

The use of combined chlorine allows systems to meet the required maximum contaminant levels (MCLs) for THMs and HAAs.

So, during the three-month quarter, the Big City produced water for 51 days with free chlorine and water for 41 days with combined chlorine.

Big City did not notify RWD 1 that the change from combined chlorine to free chlorine was occurring. RWD 1 sampled on August 27 and had high THMs and HAAs. Table 1 shows the results of the samplings.

It is unfortunate that the RWD 1 did not have prior knowledge of the change so that RWD 1 could have collected samples during the August 1 to August 10 period so that like Big City, the purchasing RWD 1 could have had low THMs and HAAs. RWD 1 would have been in compliance with this rule just as is Big City.

It is important to note that the RWD 1 customers and the Big City customers are drinking the same water with the same levels of THMs and HAAs. But Big City was in compliance with required MCLs and RWD 1 was not in compliance.

That concern aside, this result is now only becoming a huge problem for RWD 1 and other systems that purchase water from Big City.

RWD 1 Public Notice

The RWD 1 samples were collected and submitted to KDHE on August 27; the KDHE analyses were complete by September 5; the KDHE lab reported the analyses by September 19; RWD 1 received a letter from KDHE

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RWD 1 Sample Results

Date	THMs	HAAs
November 12, 2013	61	52
February 11, 2014	46	36
May 7, 2014	67	39
August 27, 2014	230	130
Annual Average	101	64
Required Annual Average	80	60
THMs and HAAs results in micrograms per liter (ug/l); i.e. 80 ug/l = 0.080 mg/l		

Table 2

requiring a Public Notice a few days after the November 19 date of the letter because the samples exceeded MCLs for THMs and HAAs.

Public notice was required because annual averages were greater than the MCLs due to the high results for the samples collected on August 27 when free chlorine residual was being used by Big City. The annual averages are shown

Cost of One Public Notice for RWD 1

Postage	\$300
Printing/copying	\$175
22 Hours labor /overtime estimated	\$375
75 miles driven	\$48
TOTAL	\$898

Table 3

in Table 2. As can be seen, prior samplings had much lower THMs and HAAs.

The RWD 1 public notice costs were \$300 for postage; there is a cost of \$175 for printing/copying a double-sided flier; RWD 1 logged 16 regular-hours and six hours of overtime for writing, folding, stamping, and contacting KDHE and others; and RWD 1 staff drove 75 miles for trips to the printer and post office. This is for approximately 650 notices. See Table 3 for the costs of one public notice. This cost will be repeated to some extent on subsequent public notices that will be required.

Because compliance is determined quarterly with each subsequent sampling, RWD 1 will probably have to issue additional public notices two to three more times due to the annual average being greater than the required MCLs. This situation is all due to the high THMs and HAAs from the August 2014 sampling.

Remember, Big City did not have to issue a public notice in 2014 and will probably not have to issue any public notice in 2015. And remember also, this is in a situation where the customers of RWD 1 and the customers of Big City are drinking the same quality water. This is the unreasonableness of the Stage 2 Rule regulations that have been promulgated by EPA.

Unreasonableness for RWD 1

There are several issues that make the RWD 1 situation unreasonable.

First, RWD 1 will have to issue probably two to four public notices because of the “annual average” that EPA uses to define compliance. It is thought by some that THMs and HAAs present only a possible, long-term risk over many decades or a lifetime. Still, the compliance and public notices are determined on an annual (very short-term) basis.

The Big City / RWD 1 situation was/is that the high THMs and HAAs occur only over a 41-day period in the 365 day “annual” average period. In the Big City / RWD 1 situation, compliance and public notice are determined by when the system collects the samples. As we have seen, Big City knew when to sample to achieve compliance and avoid public notice; RWD 1 was not made aware of that by Big City. Again, Big City customers and RWD 1 customers are drinking water with the same quality.

Second, RWD 1 does not chlorinate or otherwise treat the water in a way that would affect the testing results. These levels of THMs and HAAs in the water are determined only by the operation of the Big City water treatment plant. Again, Big City is not required to issue



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public notice and RWD 1 is required to do so.

Third, the sampling data for RWD 1 for the nine months prior and the twelve months after the August 2014 samples will most likely have THMs and HAAs below the MCLs. But RWD 1 will continue to have to issue subsequent notices because the EPA rules require a compliance determination on an “annual” average basis and not a sample basis, not a two-year or five-year basis, or not on a decade or lifetime basis.

It is said that “the devil is in the details” and in this case, the details are the federal regulations, written and promulgated by EPA employees, that determine what is compliance and how it is determined. Those who operate and manage water supply systems and many citizens would agree that common sense and sound reasoning differ with how the regulations are written and implemented.

There are other cities and rural water districts in Kansas that purchase water and also have been “taken to the next level” with the Stage 2 Rule as RWD 1 has. These are mostly small systems and probably do not understand the so-called “reasonableness” of the situation either.

Actual Kansas Case 2: Sampling Once Annually

Under the Stage 2 Rule, if a water system serves fewer than 500 persons and has a surface water supply source, the first and annual sample was in the July to September 2014 quarter. If a system serves fewer than 10,000 persons and has a groundwater supply source, the first and annual sample was also in the July to September 2014 quarter. Thus, those systems sampled in only the last quarter (“annual” sample) of the first year of sampling of October 2013 to September 2104.

Under the Stage 2 Rule, if the one, annual sample taken had THMs and/or HAAs above the MCLs, then the system is placed on quarterly monitoring. There are many Kansas systems that fall into this situation. Many of these systems purchase water and do not treat the water like the prior situation of RWD 1.

The systems going from annual monitoring to quarterly monitoring will see the annual sampling cost for THMs and HAAs increase four times. For many small systems this is a significant increase in costs and seems very unnecessary.

Among others, there are three large water suppliers that operate surface water treatment

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plants and sell water to these small systems that were on annual monitoring. Because the treatment plant produced water that did not meet the MCLs during the July to August 2014 sampling period, many of these small systems have had to go to quarterly monitoring.

Among these three large water suppliers, 20 small systems have had to increase monitoring from annual to quarterly. Ironically, like Big City previously discussed, the water producers/sellers are not out of compliance because they were

already sampling quarterly and the monitoring from the previous nine months had low values that kept the annual average below the required MCLs.

Increasing from annual monitoring to quarterly monitoring for these small systems increases the annual costs of monitoring by approximately \$525 to \$600 depending on the laboratory used. The 20 small systems and others across Kansas have fewer than 175 connections and some as few as 15, 25, 31, and 36 meters. The additional monitoring represents a significant increase in monitoring costs for those systems. It amounts to more than \$3.00 per meter per month for the system with 15 connections.

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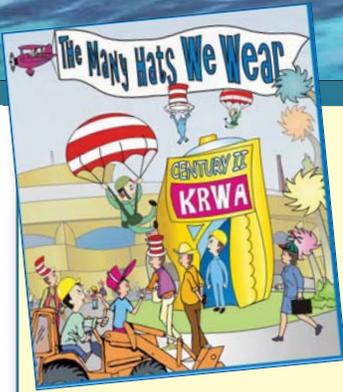
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I hope that readers will
 à end the upcoming 2015
 KRWA Annual Conference &
 Exhibition at Century II
 Convention Center in
 Wichita, March 24 – 26.
 I want to draw à ention to
 these sessions that deal
 with drinking water quality and regulations:

Tuesday, 3/24

- ◆ Chlorination: Operation, Maintenance and Safety
- ◆ Geology, Aquifers, and Water Wells – Ensuring a Good Water Supply

Wednesday, 3/25

- ◆ Regulatory Update for Public Water Supplies
- ◆ How to Perform Water Storage Tank Maintenance
- ◆ POU Installations – Achieving Drinking Water Standards
- ◆ Bacteriological Sampling and Chlorine Residual Monitoring
- ◆ Residuals and Security: Addressing the Challenges

Thursday, 3/26

- ◆ The Revised Total Coliform Rule – Changes are Coming!
- ◆ Disinfection Byproducts: Being In or Out of Compliance
- ◆ Water Well Location and Construction

Again remember, these small systems are not chlorinating or treating the water. These systems can in no way affect the THMs or the HAAs in the water. The customers of the small systems are drinking the same water as others who already are in compliance because they sample on a quarterly basis.

These small systems show that compliance and monitoring costs are determined by when the samples are taken and not directly, solely because of the water quality. The drinking water quality does not change, just the monitoring frequency and costs.

“Taking It To The Next Level”

This Stage 2 Rule “next level” has increased monitoring costs and public notice costs for small systems. At the same time, no water quality benefit is being realized. In fact other systems are drinking the same water but do not have to issue public notices; they also do not have the increased costs

This Stage 2 Rule “next level” has increased monitoring costs and public notice costs for small systems. At the same time, no water quality benefit is being realized.

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while drinking the same water. Does this sound unreasonable?

KDHE administers the rules that EPA has put into federal regulations. In effect, KDHE is just the “middle man” in most drinking water regulatory matters. The problem affecting water suppliers are the regulations – not the agency carrying out the implementation.

We must all be vigilant in these matters as additional regulations are being presently considered and will be promulgated by EPA. As you read this article, EPA employees are considering changes in the lead and copper rule, and regulations on storage tanks. This “next level” could have similar results.

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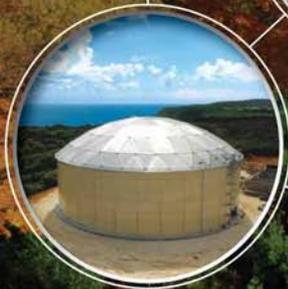
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