

Ergs, Joules & Such

Notes on Energy Savings for the Rural Water Community and Maybe Others



June 2012

We've been reviewing National Rural Water Association (NRWA) White Papers that are completed and have been approved by the NRWA Board. This month I would like to digress and go over a paper by Scott Rubin that is still in draft form but contains important conclusions you need to be aware of.

In this paper, Scott reports on an analysis of he has conducted for NRWA of **Violations Data** as reported in the EPA SDWIS database for 2011. As you will see in the following discussion, the conclusions reached are thought provoking to say the least.

For years, it has been a common practice in the water industry for statements, both verbal and written, to arise to the effect that small systems have trouble meeting state and federal regulations because of their small size, lack of resources and personnel, etc. For example, Scott begins his paper with this citation: *For example, the U.S. Environmental Protection Agency (US EPA) writes: Given their small customer base, many small water systems cannot develop or access the technical, managerial and financial resources needed to comply with the increasing number of EPA regulations and rising customer expectations.*

These water systems may be geographically isolated. Their staffs often lack the time or expertise to make needed infrastructure repairs; install or operate treatment; or develop comprehensive source water protection plans, financial plans or asset management plans.

As a counterpoint to this statement and the possible misconceptions it creates, let's look at some of the paper's principal conclusions.

- ❖ Smaller water systems are no more likely than larger systems to violate health-related requirements.
- ❖ There is no difference in the presence of violations in groundwater and surface water systems.

- ❖ Fewer than 20 percent of community water systems (CWS) with violations exceeded an allowable level of a contaminant in drinking water.
- ❖ Smaller CWS appear to be more likely than larger systems to violate monitoring, reporting, and notification requirements.
- ❖ On a contaminant-specific basis, five regulations account for 85 percent of all CWS with health-related violations: total coliform, stage 1 disinfection by-products, arsenic, lead and copper, and radionuclides

It seems clear from Scott's work that the water industry is doing a good job of providing safe drinking water to their customers. Further, small systems provide as high a quality water as their larger counterparts although their monitoring and reporting performance as reflected in violations statistics needs improvement. Stay tuned for the "rest of the story" as this important paper moves through the review process.

August 2012

In our continuing review of National Rural Water Association (NRWA) White Papers I thought this month we would look at the topic of Compliance Data Variability. This refers to the variation in results of determinations of the amount of a contaminant in water sampled from a specific entry point to the distribution system of a water supplier. This is a subject of critical importance to water systems as these results (normally the average of four quarterly samples) are used to judge whether a system is in regulatory compliance and may be the basis for requiring expensive treatment. The NRWA has investigated this topic thoroughly with four white papers being generated and a peer reviewed summary paper currently undergoing consideration by the American Water Works Association for possible publication in Journal AWWA. The four NRWA white papers are: *Reliability Of Laboratory Data Generated For Compliance With Drinking Water Regulations* by Charles Phillips; *Applicability of Laboratory Data Generated for Compliance With Safe Drinking Water Regulations* by Charles Phillips; *Water Quality Compliance Decisions Based On Four Quarterly Measurements* by Charles Phillips and Harry Chemylinski; and, *Required*



Hydro Optimization & Automation Solutions
5701 North 58th Street
Lincoln, Nebraska 68507

Control System Integrators

SCADA Telemetry Instrumentation VFD's
Water Waste Water

WWW.HOA-Solutionsinc.com Phone: 402-467-3750
Email: Sales@HOA-Solutionsinc.com Fax: 402-467-1568
Lincoln, Chris, Andrew, Mitch, Randy, Joel, Troy and Debi

Quality On Tap!



Number Of Samples For Acceptable Precision Of Compliance Data Means by Harry Chemylnski and Edwin L. Sensintaffar.

Due to the importance of this topic to water systems I felt that a summary of these papers would be important and the following bullet points summarize the key findings. Please keep in mind that variability in this context refers to **total variability** in the individual results making up a mean, **not just analytical variability in the laboratory.**

- ❖ The latest data used in this evaluation and the most reliable were taken from EPA's second 6-Year Review Database which provided over 900 sets of four or more samples from specific system entry points.
- ❖ Although the database contained a wealth of entries, the majority were non-detects with positive results being available only for a limited number of contaminants; 10 were selected for statistical analysis.
- ❖ The principal statistical parameter used in the analysis was the 95 percent confidence interval (CI) of the mean which is the range of values around a calculated mean that one can be 95 percent certain includes the true value of the contaminant concentration.
- ❖ **The average value for the CI for all 970 data sets analyzed was 105 percent of the mean. In other words, on average when a system receives or**

calculates a mean of four quarterly sample analyses, they can only be 95 percent certain that the real value of the concentration is the mean +/- 50 percent of the mean.

- ❖ Perhaps even more startling is the additional finding that when the mean is at or near the MCL, the average CI is 193 percent of the mean. **Under these conditions, on average a system manager could only be 95 percent confident that the true concentration is somewhere between about zero and twice the mean value.**
- ❖ Theoretically, it should be possible to improve this situation by additional sampling, but additional evaluation of the data showed that for numerous contaminants the additional number of samples is too large to be practical.

Stay tuned for more on this critical issue and **be as sure as possible of contaminant concentrations before taking any corrective action.**

Dr. John Regnier has a Bachelor of Chemistry degree from the South Dakota School of Mines and an ME and PhD in Environmental Engineering from the University of Florida. He is President and owner of High Point, Inc., an environmental engineering consulting firm in Prattville, Alabama. He is a consultant to the National Rural Water Association.



COMPLETE PUMP AND MECHANICAL SERVICES

VERTICAL & HORIZONTAL

LARGE TO SMALL






DOUGLAS PUMP SERVICE

Emergency Service
Complete Machine Shop
Repair Shafts and Sleeves
Balancing and Vibration Analysis
All Types of Pump Repair
Blowers and Mixers
Deep Well Service
Gear Boxes

SUBMERSIBLE

LARGE TO SMALL



Tel: 913-236-8222 Fax: 913-262-8992 • 4719 Merriam Drive • Overland Park, KS 66203 • www.douglaspump.com