

Questions and Answers from the Arsenic Rule Web Cast



October 20, 2004

1. Are potential costs included in downloadable documents?

A report on the capital cost of the sites in Round 1 of the EPA arsenic demonstration program has been written and should appear on the EPA web page (<http://www.epa.gov/ORD/NRMRL/arsenic/resource.htm>) by early December, 2004. This web page currently has a downloadable Excel cost program to estimate the capital and operational cost of adsorptive media and ion exchange technologies.

2. How much contact time is needed to convert As III to As V?

The contact time for the effective oxidants of chlorine, potassium permanganate and ozone to oxidize As III to As V is less than one minute (EPA/ 600/R-01/021).

3. The cost for small water system treatment was provided on a previous slide. What population size was he referring to?

The slide showing capital costs for adsorption systems is not based upon population size, but upon the treatment of the flow (gpm) from a single well.

4. Is there any pilot test conducted at pH greater than 9? Which adsorptive media is suitable without reducing pH?

EPA is not aware of any pilot studies conducted at a pH greater than 9. All of the adsorptive media can be used without pH adjustment; however, the number of bed volumes you can treat decreases as the pH increases.

5. Has EPA looked at removal when KMnO₄ or ozone are used as oxidants?

A laboratory study on arsenic III oxidation using five different chemical oxidants was conducted in 2000 (EPA/ 600/R-01/021). The report on the study can be found on EPA's website (<http://www.epa.gov/ORD/NRMRL/arsenic/>). A printed copy of the report is also available from sorg.thomas@epa.gov.

Of the five chemical oxidants studied, chlorine, potassium permanganate and ozone were found to be very effective while chlorine dioxide and monochloramine were not effective. In addition, air oxidation, such as used to oxidize Fe II, is not effective.

6. What is the pH range for efficient arsenic removal?

The adsorptive media process is sensitive to pH and varies from technology to technology. The arsenic removal capacity deteriorates as the pH rises from 5.5 to 9.0. Ion exchange and coagulation/filtration are less sensitive to pH.

7. Was the Michigan study at a public water supply? If so, which one?

Yes, the Michigan study occurred in Holly, MI.

8. How were these facilities (demo projects) chosen? We have a system that produces arsenic at .0958 mg/L.

When EPA selected the sites, a number of factors were considered. Of these factors, the three most significant ones were location, arsenic concentration and size of system. First, a good geographic distribution of sites was sought. A second factor was the arsenic level in the source water. Higher priority was given to systems with high levels of arsenic rather than systems with arsenic levels near the MCL of 10 µg/L. The third major factor was the size of the well(gpm) to be treated. The larger the flow, the higher the cost of the treatment system. By selecting mainly small systems (i.e. lower flow), the number of demonstration projects could be maximized. Most of the sites had flows that were generally less than 200 gallons per minute.

9. Is EPA planning on revising its bottled water prohibition in light of its finding that the only exposure pathway of concern with arsenic is direct consumption, and whether in the interim, EPA will issue guidance that would allow use of bottled water for smaller systems, including non-transient non-community water systems (NTNCWSs), pending clarification of the bottled water prohibition.

The National Primary Drinking Water Regulations (NPDWR) at 40 CFR 141.101, prohibit the use of bottled water to achieve compliance with MCLs; however, bottled water may be used on a temporary basis to avoid an unreasonable risk to health. Although point of use (POU) devices, which were also prohibited, are now allowed, Congress did not address the regulatory prohibition on the use of bottled water. At this time, EPA is not developing guidance to allow the use of bottled water for compliance with drinking water MCLs for either small systems or NTNCWSs. EPA would need to gather more information and weigh the risks associated with reliance on bottled water for drinking water versus the possible cost reduction in avoiding centralized treatment or POU devices for compliance with drinking water standards.

10. Must a system take a sample after January 1, 2005 to qualify for a monitoring waiver? In the Implementation Guidance, Figure I-2 says yes, but section I-A.10.b "What systems are eligible for monitoring waivers?" says only "at least one sample has to be taken after January 1, 1990". There is no mention of the 2005 date.

There are two separate issues being discussed here: 1) grandfathering of data for purposes of compliance with the standard monitoring framework, for which the January 1, 2005 date (for ground water systems) or the January 1, 2006 date (for surface water systems) are relevant; and, 2) waivers of monitoring, for which the January 1, 1990 date is the only relevant one in the regulations. The Arsenic Implementation Guidance text in Section I.A.9 (which discusses grandfathering for compliance monitoring) and Section 1.A.10 (which discusses waivers) is correct. Figure I-2 is a little misleading because it combines these two concepts and seems to imply that you cannot get a waiver unless you have monitoring data after January 1, 2005 (ground water systems) or January 1, 2006 (surface water systems), which is not the case. The language below explains this situation in more detail.

Waivers are not permitted under the current arsenic requirements. States may begin issuing monitoring waivers under the final Arsenic Rule once a State adopts arsenic into its standardized monitoring framework and adopts the revised arsenic MCL provisions. In order to show the consistency of samples over time, full rounds of monitoring need to be demonstrated. Ground water systems with 3 rounds of monitoring results and surface water systems with 3 annual samples, where all analytical results are below 10 ug/L and all samples are analyzed with approved methods, are eligible for a waiver.

Since the question included the January 1, 2005 date, we will discuss ground water systems first. A similar issue is raised for surface water systems and whether they need to monitor after January 1, 2006.

Under the current requirements, ground water systems are required to sample for arsenic once every three years. In accordance with the Standardized Monitoring Framework, a ground water system would have monitoring results from 1996–1998, 1999–2001, and 2002–2004. If the state has determined that the system meets all waiver eligibility requirements (40 CFR 141.23(c)(5)), and the state has issued the waiver before the system is required to sample (to satisfy the 2005–2007 monitoring period), then the system would not need to sample during the 2005–2007 monitoring period.

While the waiver can be issued for 9 years, if the system in question took its last sample in 2002 (for the 2002–2004 compliance period), the system may want to consider sampling in 2011, instead of 2012 or 2013, which would allow 10 or 11 years, respectively, between sampling events.

For surface water system, the result is similar. Under the current requirements, surface water systems are required to sample for arsenic every year. In accordance with the Standardized Monitoring Framework, a surface water system would need to have monitoring results from 2003, 2004, and 2005. If the state has determined that the system

meets all waiver eligibility requirements (40 CFR 141.23(c)(5)), and the state has issued the waiver before the system is required to sample in 2006, then the system would not need to sample in 2006. This system would need to sample once by 2014.

11. Do you have an idea of how many systems in Arizona or the U.S. have problems with arsenic?

Of the 74,000 systems subject to the new Arsenic Rule MCL, the EPA estimates that 3,000 CWSs and 1,100 NTNCWSs will need to install treatment for compliance. Please contact the state of Arizona for specific state statistics.

12. Will the capital and estimated operations and maintenance costs be provided in the final pilot/demonstration project reports?

A report on the capital cost of the sites in Round 1 of the arsenic demonstration program has been written and should appear on the EPA ORD web page by early December, 2004 (<http://www.epa.gov/ORD/NRMRL/arsenic/>). Each individual demonstration site report will contain the capital and operational costs associated with the demonstrated technology.

13. Question for New Hampshire: In the NTNCWSs with dual distribution, do you require signage or other public notice at "non-potable" taps? Are any of the "non-potable" taps located in public restrooms?

New Hampshire has not yet fully inspected each of the completed four installations for this POU/POE hybrid option. When inspected, faucets in rest rooms would not typically be thought of as sources of drinking water. Restroom faucets for either public or staff use, should be signed as not potable and the plumbing piping marked appropriately. In the past, NH has indicated that pipe marking should be at least every 20 feet; but we are now considering marking pipe every 10-15 feet.

14. Are most of the different types of media interchangeable within the same basic plant design (i.e. can you use activated alumina in a treatment system designed for iron media or at least are the different types of iron media interchangeable)?

Yes, as long as the empty bed contact time (EBCT) required by different types of media is similar.

15. Is there, or will there be funding available (GRANTS), for the engineering, capital costs, and/or installation of arsenic treatment for systems under 500 persons? The current structure of State Revolving Fund loans is not conducive to assisting very small systems due to high loan application and administration costs which sometimes exceed the cost of the treatment. \$50,000 grants for water quality treatment similar to State Revolving Fund wellhead protection grants, would go far in assisting these types of systems.

At this time, EPA will not offer grants specifically to address systems serving 500 people or less. Under the DWSRF program there may be additional loan origination/administrative fees (depending on each state) that could raise the cost of borrowing money; however, the DWSRF still offers one of the best low interest drinking water financing around.

- 16. The Valley Vista treatment system included pH adjustment with sulfuric acid. Have any operational issues or operator concerns occurred when working with this acid? Is post-pH adjustment used in this case?**

So far there are no operational issues or operator concerns working with the acid. Raw water pH is adjusted to 7.1. No post-pH adjustment is used.