



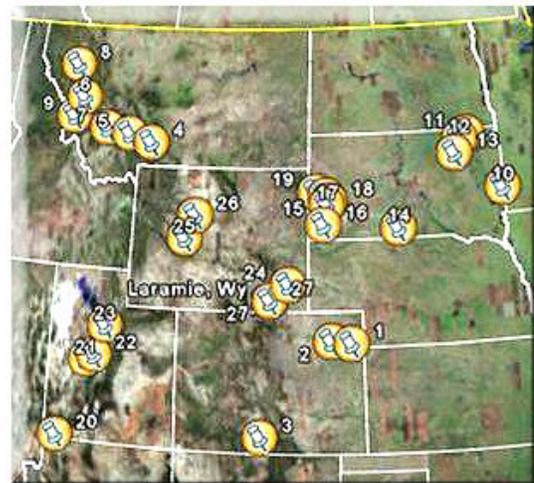
## **Arsenic in Drinking Water**

### **A Regional Assessment of Private Ground Water Wells**

Arsenic occurs at levels of concern in drinking water in areas of the plains and mountains states. In many cases, ground water is the sole source of drinking water for rural residents, tribes, and other underserved citizens. The Northern Plains and Mountains Regional Water Program has initiated research, education, and testing to provide information and resources critical for making informed decisions concerning arsenic in drinking water.

#### **Arsenic Facts:**

- Arsenic enters water supplies from natural deposits in the earth's crust and/or anthropogenic activities.
- Organic arsenic compounds are less toxic than inorganic arsenic compounds.
- Long-term exposure in drinking water, in excess of 10 µg/L, causes increased risk of skin, lung, bladder, and kidney cancer, as well as skin related problems such as hyperkeratosis, and pigment mutations.
- Excess arsenic consumption promotes cardiovascular and nervous system malfunctions, eventually resulting in death.
- Sensitivity to arsenic's toxic effects, including carcinogenic effects, varies with each individual and factors such as nutrition and genetic predisposition influence these effects.
- Although costly, some existing removal technologies include Ion Exchange, Coagulation Filtration, Activated Alumina, and Lime Softening/Soda Ash. We are currently exploring a unique adsorption removal technique that is cost effective for private and small community well owners.



**Region 8 Arsenic Sampling Points, 2005**

#### **New Regulations**

On January 23, 2006 a new arsenic drinking water MCL of 10 µg/L, became the standard for water systems throughout the United States. The lowering of the previous 50 µg/L MCL, by the Environmental Protection Agency (EPA), was in response to a study conducted by the National Research Council (NRC) in 1999. This study suggested the previous limit was not sufficient in minimizing potential health risks.

#### **Regulation Implications**

Facing violations and fines from the EPA, municipalities and public water suppliers are working to upgrade their existing facilities with new technologies, new treatments, and/or alternative methods. Although the new standard does not place any legal constraints on private well owners, they are still subject to the health implications of arsenic exposure.

*The goal of the Northern Plains and Mountains Regional Water Program is to protect and improve the quality of water resources by facilitating development, delivery, and implementation of new and existing practices throughout the region.*

### **CSREES Water Quality Network Partner Activities**

Over the past few years, scientists at the University of Wyoming have been conducting arsenic research on arsenic removal from drinking water. During the research, a noticeable need emerged to identify more information on arsenic levels in ground water in the Northern Plains and Mountain Region. This provided an opportunity to integrate arsenic research and removal technology within EPA Region 8.

Communication between University faculty in WY, CO, MT, UT, and SD resulted in the creation of a program to develop an arsenic educational network within Region 8. As a first step, a study of private and small community ground water wells was conducted in the summer of 2005. The goal of this network is to address the health risks of arsenic by implementing a water quality testing program, educating network partners on effective treatment options, and forming a region-wide dialogue that promotes understanding between private well owners and professionals within the field.

### **Program Objectives:**

- Collaborate with Region 8 States to establish potential well owner contacts.
- Develop a framework of network partners for sampling arsenic.
- Identify and collect domestic groundwater well samples in areas suspected to have arsenic problems.
- Develop an outreach and educational program to distribute arsenic research results to each of the network partners.
- Provide information about effective arsenic removal techniques for well owners.

### **For further information go to:**

<http://www.epa.gov/safewater/arsenic.html> or  
<http://www.sis.nlm.nih.gov/enviro/arsenicandhumanhealth.html>

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