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ABSTRACT

Title:

Arsenic in Drinking Water- Challenges, Problems, and Limits to Knowledge.

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Arsenic in drinking water is a contaminant of concern in the northeast. Understanding its occurrence and mobility across the landscape is a key part of the long-term management of human exposure. The spatial variability of the occurrence of arsenic in water supply wells is, in-part, a function of local geology that can vary on a small scale (<10-100m). This variability adds uncertainty to exposure risks in rural communities. Testing of private wells in three Maine towns with different types of geology finds that arsenic concentrations within a given town can vary in a non-uniform spatial pattern (As range: <2 to 119 µg/L), even though arsenic was detected in 79% of the wells tested (n=232, D.L. = 2 µg/L). These findings have implications for the overall occurrence of arsenic in drinking water wells and also for the fate of arsenic in the near surface environment in rural areas where wastewater is treated on-site. Based on mass balances, a growing quantity of arsenic is being transferred to the near surface environment where other human exposure pathways may exist. This accumulation occurs irrespective of water treatment strategies. When the mass balance aspect of arsenic is considered, managing arsenic exposure becomes more complex than just the geological variability because of uncertainty about transfer and recycle functions. Determining how to use this knowledge to reduce arsenic risks in drinking water may be the next challenge in reducing overall public exposure to arsenic.

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