

Land Application of Wastewater Containing Arsenic: Impacts on the Sorption and Mobility of Arsenic in Soil

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Purpose of the Study

Many New Mexico communities have had to develop procedures for reducing arsenic concentrations in their drinking water since the EPA lowered the MCL in 2006. The disposal of arsenic residuals is an important aspect of treating contaminated water. One possible method of disposal is to apply the arsenic residuals with municipal wastewater to the land. The researcher will study the sorption and desorption of arsenic in two different soils collected from a new land application facility near Columbus, New Mexico, to determine the feasibility of land application of arsenic residuals.

Study Underway

- Soil samples will be collected from a land application facility near Columbus, New Mexico, and analyzed for iron oxides, calcium carbonate, organic matter, and other nutrients.
- The sorption and desorption of arsenic will be compared under batch and column experiments that mimic flood irrigation patterns versus sprinkler irrigation patterns.
- Effects of the presence or absence of microbes in the soil and wastewater will be examined as well as differences due to soil properties.
- The researcher will collect plant, water, and soil samples from the wastewater treatment plant in Columbus and analyze them for arsenic and other metals.
- GIS will be used to locate communities in New Mexico that have elevated arsenic in local groundwater, population size suitable for land application of municipal wastewater, and desirable soil properties for arsenic sorption.



Benefits

- A simple, low cost solution to arsenic residual disposal will benefit smaller communities in New Mexico who must treat arsenic-contaminated drinking water.
- Understanding how soil properties, microbial presence, and application methods influence arsenic sorption and desorption will help communities select locations and application methods that optimize arsenic retention in the soil.

Left: April Ulery (left) and Sylvia Nemmers collect soil samples at the land application facility near Columbus, NM.

Top: Maria Lopez (left) and Sylvia collect a wastewater sample. Sylvia is pursuing a Ph.D. in agronomy and plans to graduate in 2009, after which she hopes to become a professor.