

Analyzing the Practical Application of Filtering Pb 2+ Using Freshwater Algae, Phase Four

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Much of the world's drinking water is contaminated with harmful compounds including lead making it unsafe for human consumption. The project goal is to design a system filter enough water for a community of one hundred people. Small volume tests have demonstrated that 71 ppb of lead in one liter can be filtered with one gram of algae. For phase 4 of this project, a new full-scale Wet Algae Mechanical Filter (WAMF) was designed and built to evaluate practical application and economic feasibility. Based upon the original prototype systems, a commercial scale model was developed as a concept and manufactured at minimal cost. The prototype was fabricated by the author using a metal tank, An ACME thread jack, a hand made plunger head, and algae filter stack then Which was tested for pressure and flow rate performance. The project analysis shows the cost comparison between the WAMF system and Brita filtration system. These to methods can remove the same amount of lead. In a theoretical community the population is 100 people. Each person needs about 2 liters of drinking water per day. The total amount of water that needs to be filtered is 200 liters. The WAMF system costs 18.43 Us dollars (USD) to run per day under these conditions. The Redi-Twist Under the Sink Replacement filters from Brita cost 26.35 USD to run per day in the same conditions. The \$7.92 difference shows the WAMF can have a huge impact to a rural community.

Awards Won:

University of Arizona: Tuition Scholarship Award