



WATER RESOURCES RESEARCH GRANT PROPOSAL

Project ID: 2002GU6B

Title: Slow Sand Filter Conceptual Design Package for The Federated States of Micronesia

Project Type: Research

Focus Categories: Treatment, Water Supply, Surface Water

Keywords: Streams, Water Quality Control, Slow Sand Filter

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Congressional District:

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Abstract

Cholera outbreaks have occurred repeatedly throughout the islands of the Federated States of Micronesia (FSM). Outbreaks occurred in Chuuk in 1983 and in Pohnpei State in April 2000. The Pohnpei outbreak resulted in 20 deaths, and over 3,000 people were infected with the disease. The rapid spread of this disease was attributed to lack of proper water and food sanitation especially in villages that are being served by small community water supply systems. There are over 14 municipal water supply systems around Pohnpei that provide untreated and non-potable water to the rural communities. These small systems provide water to more than 50% of Pohnpei's population. The other islands, Yap, Chuuk, and Kosrae, have very similar situations. Since 1999 the principal investigators of this proposed project have been exploring the use of slow sand filtration technology as a means of improving the water provided by the small community system throughout the FSM. Results indicate that it is feasible to use local materials for filters media. These studies have also determined optimum filter loading rates for the local filter media. What is needed now is to pull together the results of the pilot studies and to develop design plans, cost estimates, and operational manuals. The objective of this project is to assemble the findings of earlier Kosrae slow sand filter pilot studies and to develop detailed conceptual construction drawings, operation recommendations, and construction costs for slow sand filtration plants. The resulting recommendations and drawings will be planned around and sized appropriately for use by the many small community water supply system throughout the FSM. A site visitation will be made to all community water supply system in Pohnpei, Kosrae, and Chuuk State. Information such as how much flow is being delivered to the systems, daily water demands, and the turbidity levels of the inflow will be measured. From this information, complete drawings of the facilities for three different sizes of slow sand filters will be developed. The three sizes will reflect the smallest, largest, and medium sized community water supply systems. These drawings will show inflow and outflow pipes to the plant, the under drain systems beneath the filter media, and the required flow controls. To estimate the cost of the plants, graphs will be developed that shows the cost of the slow sand

filter plants as a function of the area of the filters. In addition, recommendation will be made on plant operations such as scraping, and back filling the filters.