Alethia Environmental

water quality analysis in the
developing and developed worlds

# Executive Summary

## Investigation of the Potters for Peace Colloidal Silver Impregnated Ceramic Filter
## Report 2: Field Investigations

In September 2001, Jubilee House Community contracted with USAID to provide intrinsic and field investigations of the Potters for Peace colloidal silver impregnated ceramic filter. Daniele Lantagne, MIT Lecturer in Civil and Environmental Engineering and Principal of Alethia Environmental, was hired to complete the work. Ms. Lantagne spent three weeks investigating the use of the PFP filter in homes across Nicaragua in October 2001. The results of the survey conducted with families using the filter, and the water quality analysis of pre- and post-filtered water are presented in Report 2: Field Investigations. Report 1: Intrinsic Effectiveness will be completed in December of 2001.

Potters for Peace manufactures filters which are sold to NGOs that implement a water filtration program in the communities they work within. Working with three partner NGOs, a total of 33 homes in seven communities were visited during the three-week field trip. Twenty-four of the 33 homes (73 percent) were using the filter at the time of the unannounced visit.

The results of the survey conducting in these 24 homes were:

- NGO follow-up with families increased continued usage rates.
- The most common problem seen was breakage of the filter or receptacle.
- There is a lack of education about safe water practices, as well as correct usage and maintenance (including cleanliness) of the filter.
- The flow rate in 14 of 24 of the homes did not meet basic requirements for drinking water. This is due to the accumulation of turbidity on the filter itself. Scrubbing the filter with a brush can regenerate the flow rate.
- The PFP filter is well liked by families because of ease-of-use and taste of the water.

The results of the water quality monitoring in these 24 homes were:

- Silver concentration in the finished water does not pose a human health risk.
- Water quality parameters measured were not outside normal values.
- Only 4% of the filters removed total coliform, 25% removed $H_2S$-producing bacteria, and 53% removed *E. coli* when it was present. This is due to contamination of the receptacle and inadequate storage of water.
- Latrine ownership, household cleanliness, and plastic receptacles were correlated with microbial removal.
- No household with a filter that removed microbial contaminants had a child with diarrhea in the last month.

Based on these results, the following recommendations are presented:

- Partner NGOs should be educated on factors that affect the success and failure of the filter. They should also be encouraged to regularly follow-up with and provide education to the families with the filter. A manual providing information and projects tips should be developed and distributed to NGOs with a filter program.
- A cleaning kit that can be used to scrub the filter to regenerate the flow rate and to disinfect the receptacle to prevent recontamination should be developed and sold with each filter. In addition, families need to be educated about correct filter cleaning methods.
- Plastic receptacles should be encouraged over ceramic, despite the traditional benefits.

Lastly, three rural point-of-use water filtration programs were compared. The Potters for Peace filter compared equally with the Center for Disease Control's Safe Water System and the Gift of Water, Incorporated two-bucket purifier. Recommendations for improvement of the PFP filter include changing the methodology to include a residual in the finished water and obtaining government accreditation of the program.

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