



## Expansion of Baseline Data for the Northern Guam Lens Aquifer and Evaluation of Innovative Treatments to Reduce Contaminant Input to the Aquifer



**Funded by:**  
**US Geological Survey, Water Institute Program**

**Principal Investigators:**  
**Joe Rouse, Nathan Habana, & John Jenson**

The Northern Guam Lens Aquifer (NGLA) is Guam's primary source of freshwater for potable use. This porous limestone formation currently provides approximately 80% of the island's municipal water supply. Aggressive production of groundwater has grown to 40 million gallons per day (mgd). With water demand rising and concerns over water quality increasing, proper management of this freshwater source has become critical to the welfare of the island's increasing population of residents and tourists. Preliminary inquiries have suggested that contaminants from anthropogenic sources are showing up in the NGLA. Much more baseline data of contaminant concentrations well-water samples is needed to determine if the problem is greater in zones with sewer collection lines, or in zones that rely on household septic tanks; furthermore, it is not known if contaminant levels are increasing, or not. It is essential that these issues be studied before actions are taken to extend sewer collection lines or even build new wastewater plants in Northern Guam. In addition, the effectiveness of septic tanks is also an issue of concern. As an alternative to traditional septic tanks, consideration is increasingly given to use of single-family prefabricated, packaged treatment units. It is considered that these units could serve to reduce the potential of contamination reaching the water table, though insufficient testing has been done to evaluate their potential.

Accordingly, we intend to conduct a study that will offer further enlightenment as to the transport and fate of contaminants of anthropogenic sources in the NGLA, and will evaluate methods for reducing contaminant input to the sub-surface. These results will strengthen modeling capabilities addressing the water quality, thus being of importance to human safety. The project will include fieldwork distributed over several months, consisting of setting up testing probes at well heads for onsite data collection and of transporting samples to the

lab for further testing and data assessment. The result of the proposed study would be an improved body of knowledge concerning the current state of water quality in the NGLA. In addition, treatment capabilities of packaged treatment units will be determined. Such information would be advantageous for a range of applications, including the development of planning strategies for installation of single-family package treatment units. It would also allow for more informed decision making regarding extension of collection networks. Results of this study would be presented at environmental conferences and published in a WERI Technical Report to be made available to authorized stakeholders.



**Installation of multiprobe meter at GWA well F-13.**