



Proposal for Student Design Work and Prototyping Navajo Home Water Systems

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Nearly 40% of Navajo families don't have clean, running water at home. DIGDEEP is a non-profit organization working on the Navajo Nation in rural New Mexico, where families living below the poverty line haul dirty or expensive water from open ponds, livestock troughs or bottling stations up to 50 miles away.

We're digging a new well in the middle of this remote community and delivering clean water to local homes by truck. We need help designing a PV-powered system that can safely store, pump, filter and heat this water for use in the home. More than half of the families in the area do not have electricity.

We have already begun installing conventionally-powered home water systems. An overview of those systems is attached to this proposal. We would like your help modifying these systems to run on photovoltaic power. Our goal is to develop an inexpensive prototype system together that DIGDEEP can then replicate and install. To be successful, the system needs to be easy to understand, maintain and repair.

As currently installed, our Home Water Systems include a 1200-gallon tank, a Grundfos Scala pump, a tankless water heater, a particulate filter, a sink and a gravel drainage field. Right now the pump is drawing water from the tank into the dwelling through about 20 feet of 2" hose, up a vertical distance of about 8 feet. The pump (1/2hp, 100vac) has a starting inrush load at 3150 watts. Pump specs can be accessed [here](#). The water heater has a resistance load and requires 12A / 120V power as installed. Heater specs can be accessed [here](#).

Ideally this system would service the need for running water both day and night.

Your work will have an incredible impact on the families we serve. Running water [changes these families' lives forever](#). Thanks for your consideration.