

The University of Texas Engineers Without Borders Mexico Project: Jaboncillos Chico, Coahuila Project Status & Implementation Trip Plans

The start of the academic year 2006-2007 was a busy one for the Engineers Without Borders Mexico Project Team. The assessment trip had just been completed. As such, all the data and information necessary to begin the design of the water distribution system had been gathered. The entire semester was spent designing a comprehensive water system for the town, primarily through an independent study class that met twice a week.



The project was divided into two groups; distribution and purification. The distribution group was focused on the development of a piping system to physically distribute the water to houses, a solar-powered pumping system, and an agricultural storage tank. The other group worked on the design for a drinking water purification system.

Through the use of the piping/hydraulics program PIPE2000, the distribution group developed a town-wide piping system beginning at the source and extending all throughout the town with a faucet at every occupied house as well as several other public locations. The elevation data obtained from surveying on the assessment trip was vital information in developing this design. Many different cases were simulated in PIPE2000 and the most efficient set-up with ample flow rates was found. The pipeline will consist of a local plastic piping material, called *manguera negra*. A *Grundfos* submersible pump powered by three solar panels manufactured by *BP Solar* will supply water to the system.



During spring semester 2007, a plan for the agricultural storage tank was developed. A pre-fabricated tank, approximately 5000 L in volume, will supply water for agricultural development in adjacent fields. The tank, as well as most of the piping system supplies, will be purchased in a nearby city, Muzquiz.

The purification group began the academic year researching various purification methods that could possibly be used for the water supply in this small town, namely ultra-violet purification, chlorination, biosand filtration, and solar distillation. Biosand filtration was chosen as the most suitable form of disinfection but it was soon discovered that the purification plans were unnecessary as the results from the

assessment trip water tests were examined. All tests performed but one (Total Dissolved Solids) met EPA standards for drinking water so disinfection was determined to be unnecessary. These results were confirmed through further water testing during the pre-implementation trip in January, 2007.

A third trip to Jaboncillos Chico was undertaken in January 2007. The design was brought to the community for their approval and corrections. Once approved, the entire pipeline was marked out with stakes will be dug out prior to the team's return in March for implementation. Further surveying points and distance measurements were taken, allowing for exact pipeline lengths to be determined once returning to school. During spring break of 2007, the Mexico project team will along with two students from the Northern Arizona Chapter of EWB will travel the Jaboncillios Chico to build this water system.

