

## Hopi Utilities Corporation Arsenic Mitigation Project

### Hopi Villages at First and Second Mesa, Arizona

#### CLIENT

Hopi Utilities Corporation

#### HIGHLIGHTS

- Final design of regional water system
- Design of 40 miles of transmission pipeline

Daniel B. Stephens & Associates, Inc. (DBS&A), a wholly owned subsidiary of Geo-Logic Associates, designed and provided construction services for the regional water system known as the Hopi Arsenic Mitigation Project (HAMP) that provided a new water supply to Hopi Villages at First and Second Mesa. The intent of the project was to provide water that meets the U.S. Environmental Protection Agency and Hopi water quality standards for arsenic by developing a new water supply and designing a new transmission system to bring the water to the Villages. Almost every water system in the First and Second Mesa areas of the Hopi Reservation was non-compliant with the standards, due to naturally occurring arsenic concentrations of approximately 15 to 40 micrograms per liter.

The scope of the project included:

- Approximately 40 miles of water transmission piping, primarily high-density polyethylene, ranging in size from 8-inch to 12-inch diameter
- Four at-grade welded steel water storage tanks
- Equipping and site development for two wells, including concrete masonry unit (CMU) block wellhouse buildings
- Three skid-mounted booster stations, including CMU block buildings
- Altitude, pressure reducing, and flow meter valve vaults
- System-wide supervisory control and data acquisition system
- Associated electrical improvements

Preliminary engineering and planning included a technical evaluation of specific alternatives for achieving compliance with the arsenic standards and evaluating opportunities for source water blending, importation, and treatment or new source water development using detailed sets of evaluation criteria. That study recommended a regional water system be implemented.



Construction of the regional water system for the Hopi Utilities Corporation

Two wells previously drilled under contract with Indian Health Service (IHS) now supply the water system. One of these encountered water quality problems. The firm designed and oversaw drilling and construction of one additional well, which is connected to the water system. The new wells supply water that meets the arsenic standards to the villages at First and Second Mesa. We evaluated alternatives proposed by IHS for the regional HAMP system and recommended an improved alternative that would lower overall operating pressures and reduce electrical costs. Our evaluation included hydraulic analysis using a water model in InfoWater.