

PROJECT BRIEF

GEOPHYSICAL INVESTIGATION HENDERSON, NEVADA

Project Description

A geophysical investigation was conducted at a large site in Henderson Nevada to map paleochannels. Subsurface geology at the site consisted of 10 to 100 foot thick sequence of sands and gravels overlying a massive clay unit. Concerns that paleochannels cut into the clay layer may affect the flow of groundwater through the site prompted a geophysical survey to map the top of the clay unit. Several geophysical techniques, including time and frequency domain electromagnetic (TDEM and FDEM), 2D resistivity imaging and seismic refraction were evaluated during a feasibility study. Ultimately TDEM and FDEM techniques were selected to characterize the site.

Work Performed

Geophysical Instruments used during this investigation included the Geonics EM-31 and EM-34 terrain conductivity meters, Geonics EM-47 TDEM system and Mount Sopris MGX II digital logging system with a Geonics EM-39 EM induction probe.



GEONICS EM-34 TERRAIN CONDUCTIVITY METER



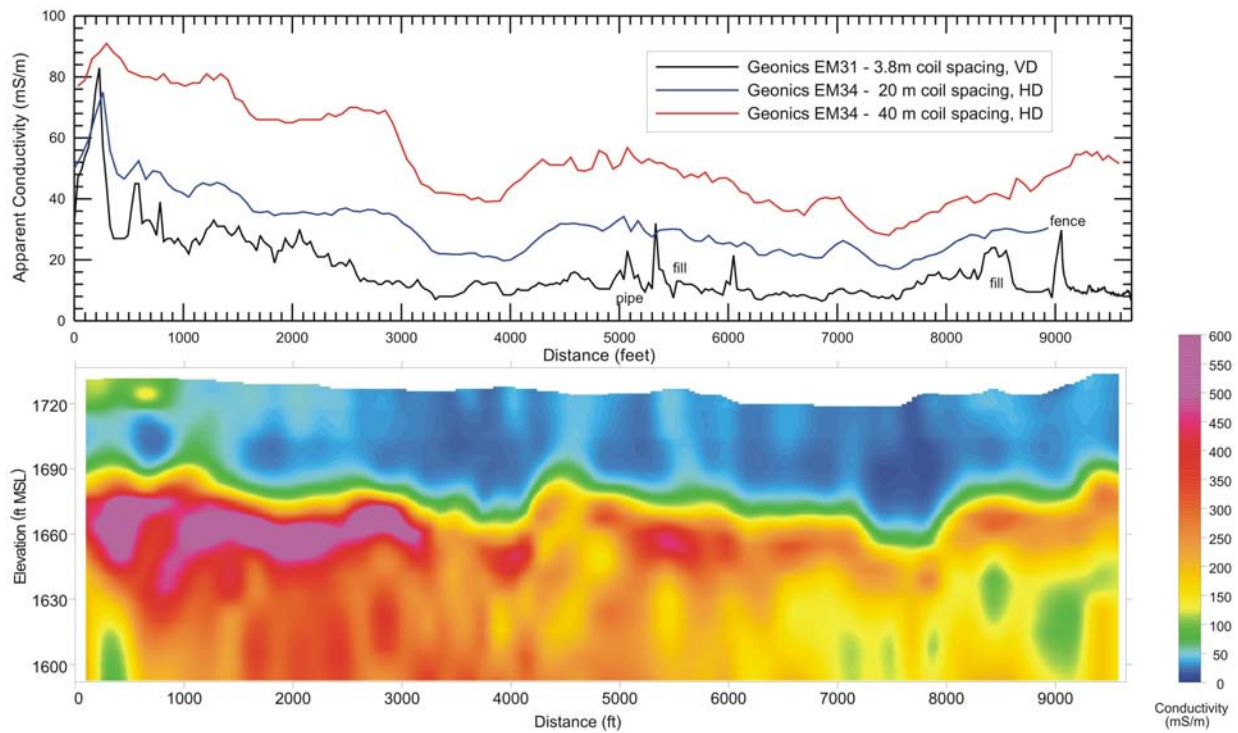
GEONICS EM-47 TDEM SYSTEM

The scope of work included the following:

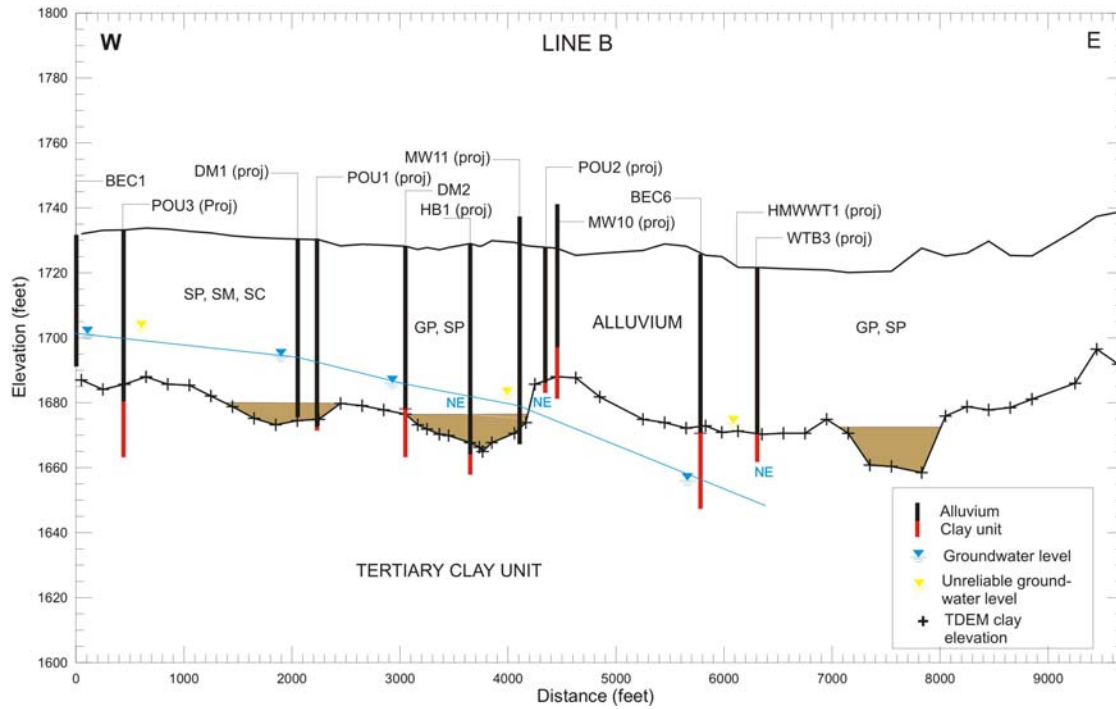
- EM Induction Logging of 16 groundwater monitoring wells at the site
- A total of 14 miles of EM-31 and EM-34 data acquired along 10 profiles
- A total of 380 TDEM soundings conducted along 10 profiles

The EM Induction logs were presented as plots of electrical resistivity/conductivity versus depth and correlated to EM-31, EM-34 and TDEM data. EM-31 and EM-34 data were presented as plots of apparent electrical conductivity versus distance along each profile. TDEM data were inverted to obtain both 1-D layered and smooth models of resistivity versus depth. The 1-D layered models were used along with borehole data to generate geologic cross-sections along the profiles. The 1-D smooth models were used to generate color images of the profiles.

The geophysical investigation successfully located several large paleochannels bisecting the site and results of the investigation were used to guide future drilling investigations.



GEONICS EM-31 AND EM-34 PROFILE (TOP) AND ASSOCIATED 2D TDEM IMAGE (BOTTOM)



GEOLOGIC CROSS SECTION GENERATED FROM 1D LAYERED TDEM MODELS AND BOREHOLE DATA