

Catskill Aqueduct Waterline Installation

GPR and EM
Subsurface Mapping



BACKGROUND

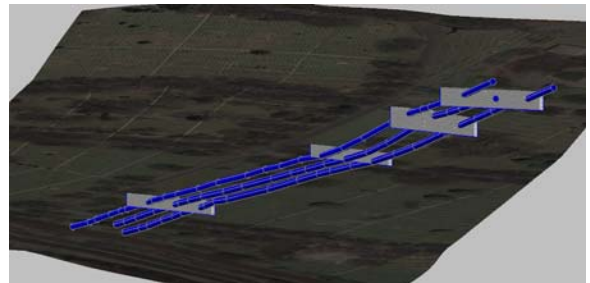
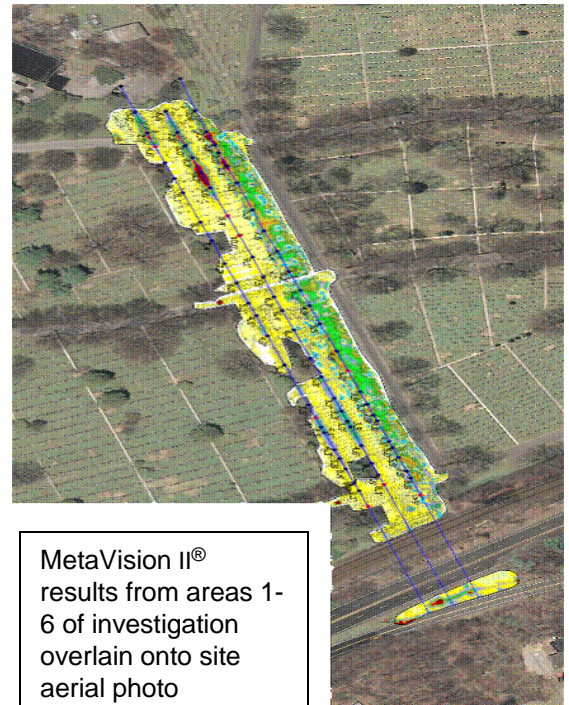
Malcolm Pirnie, a design engineering firm, contracted Underground Imaging Technologies Inc. (UIT) to perform a geophysical subsurface survey for the installation of a 16-inch water line. The line was to be installed along the path of the existing Catskill Aqueduct in Westchester County, NY which supplies water to NYC. The precise location of the three Catskill Aqueduct pipes was poorly constrained throughout the project area. Malcolm Pirnie required accurate 3D positions of the pipes and other underground utilities, in order to design the alignment to avoid conflicts during installation of the new waterline, pumping station, and related facilities, and to conduct geotechnical sampling.

SCOPE & RESULTS

The survey was performed over a 182,700 ft² area broken down into 7 separate investigation areas. In particular the 9' 5" diameter aqueduct pipes were confidently located at varying depths throughout the area of investigation. Additionally, numerous other utilities were located and mapped. Three dimensional locations were successfully determined through the implementation of both single channel and multi-channel GPR units as well as the DualEM-4 and multi-sensor EM systems.

METHODOLOGY

The UIT 14-channel TerraVision II[®] GPR unit, and MetaVision II[®] multi-sensor EM devices in addition to a 200 MHz single channel GPR and a DualEM-4 ground conductivity meter were used to conduct the survey. The geophysical tools were coupled to an RTK GPS receiver and a laser robotic total station for collection of high-precision geo-referenced location information. Later these data were loaded into proprietary interpretation software – SPADE and final results were plotted on CAD maps provided to the client.



3D rendering of the three existing aqueduct pipes with the site terrain for background.