

Utilizing Geophysical Methods to Optimize Pipeline Routing and Horizontal Directional Drilling

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Summary

The varying geology and topography of planned and existing pipeline right of ways (ROW) requires advanced subsurface knowledge to optimize pipeline planning, design and construction. The ROW setting can determine whether a pipeline needs to be buried, the type of drilling rig needed to route a subsurface installment, the drilling method required, as well as the optimal drill path. Geophysical techniques can be used, in conjunction with geotechnical drilling methods, to provide cost effective, continuous subsurface information along the ROW. Depending on the environment, one or a combination of seismic refraction, multichannel analysis of surface waves (MASW), electrical resistivity tomography (ERT), waterborne seismic refraction, waterborne ERT, and unmanned aerial vehicle (UAV) photogrammetry can provide continuous subsurface and aerial vantages of a pipeline ROW. This presentation will outline two projects in which land and waterborne seismic refraction, in combination with ERT and UAV aerial photogrammetry, were leveraged to optimize pipeline routing design and construction.