

Case Study

Texas Earthen Dam Seepage Flow Path Study

Texas, USA

Willowstick characterizes seepage flow paths through the dam

Background

An engineering company was set to build a new outlet structure for a reservoir. They had been monitoring the dam for seepage and wanted to gain a better understanding of where seepage was occurring. Of significant importance to the client was the

desire to characterize any preferential seepage flow paths along the embankment's full length. An accurate understanding of the seepage conditions would allow for targeting monitoring and remediation efforts to suspect areas. A Willowstick geophysical investigation was employed to help identify and characterize groundwater flow.



The problem

Traditional methods for characterizing seepage flow can be both expensive and time consuming.

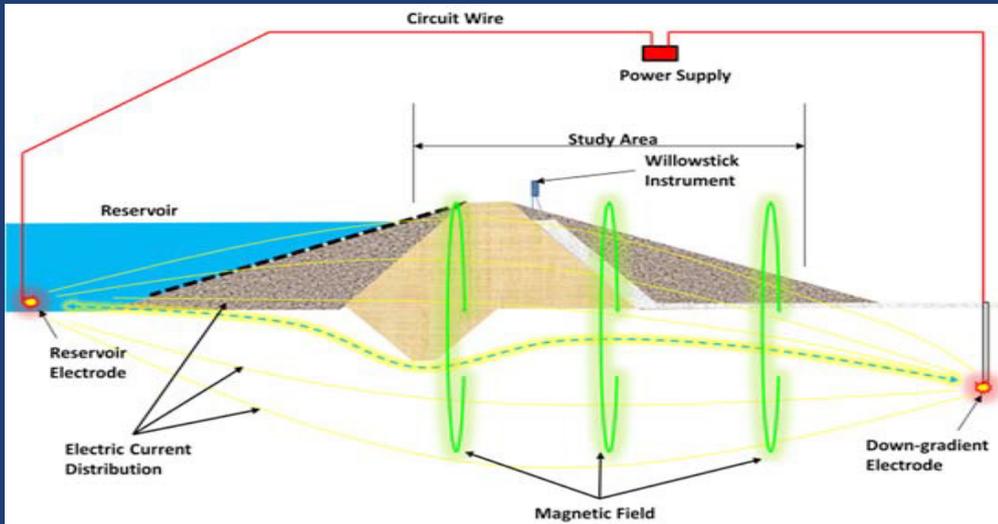
Willowstick Technologies was contracted to help the client identify the seepage flow paths. The plan was to survey the whole embankment and characterize all seepage flow paths through the dam. Priority was given to the area between the main outlet structures.



How the technique works

The Willowstick method provides industry-changing accuracy and value. The technique energizes the groundwater of interest directly with an alternating electric current. Groundwater tends to be far more electrically conductive than the surrounding rock or earthen materials.

This causes the electric current to gather in and flow through any subsurface water bearing features, generating a magnetic field that is measured in a grid-like pattern at the earth's surface using a highly sensitive magnetometer. This magnetic field data is then used to generate maps and 3D models of the subsurface groundwater conditions, including any preferential flow paths.



The Results

The Willowstick investigation identified one wide seep zone along the embankment. The surveys identified both the location and the depth of seepage flow. From the start of fieldwork to delivery of the report was about six weeks. This represents a substantial time and cost savings when compared to drilling.

