

Case Study

Teapot Dome Oil Field

Map Subsurface Flooding

Wyoming, USA

Willowstick maps preferential flow paths in operations subjected to steam or water flooding

Study conducted in cooperation with Rocky Mountain Oilfield Testing Center (RMOTC)

In August of 2005, Willowstick Technologies, LLC performed a study at the Teapot Dome oil field near Casper, Wyoming. The project was performed with the Rocky Mountain Oilfield Testing Center

(RMOTC), a unit of the United States Department of Energy. The purpose of the project was to demonstrate how the Willowstick technology can be applied to subsurface oil reservoirs that are subjected to water or steam flooding, and to map the subsurface water paths.



Shannon formation 400 feet below surface was targeted

For this pilot study, Willowstick chose to target the Shannon formation, which lies approximately 400 feet below the surface of the ground. This formation has been the target of numerous different EOR activities, including fire floods, water floods and steam floods.



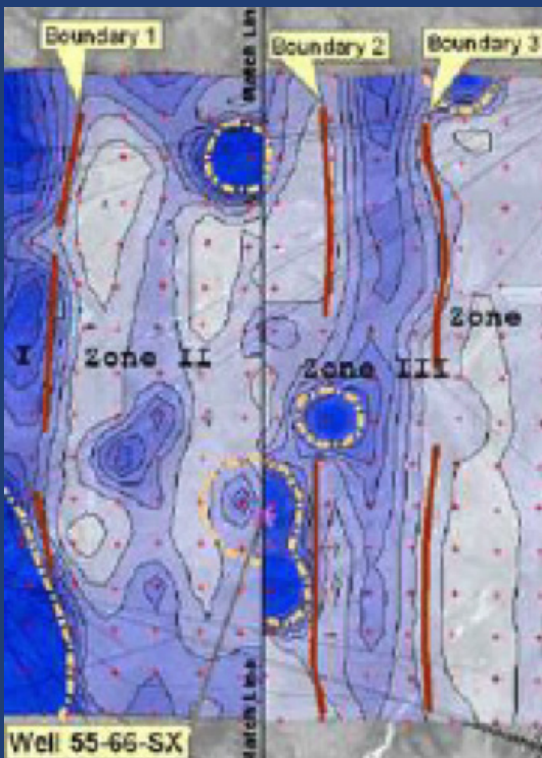
Electrodes placed in five existing wells

The survey encompassed about 48 acres of land and used five existing wells in which to place electrodes. Data was collected over a period of two weeks.

Measurements collected from two different perspectives

The groundwater in the Shannon formation was energized from two different perspectives, using well 55-66-SX (an injection well) for electrode placement and using a pair of wells (producer wells) to the west and east of the main survey area as return electrode placements. A 100 ft X 100ft grid was set up along the surface of the ground, above the oil reservoir.

The two survey perspectives showed similar anomalies suggesting the existence of three major hydrogeologic barriers, which indicate the presence of four distinct saturated zones trending north to south.



Confirmation of the study results

Analysis of historical production data, along with reservoir studies of the Shannon Sandstone, confirm that the hydrologic boundaries detected by the Willowstick technology likely exist.

These boundaries or zones are probably due to geologic changes affecting permeability across the formation. The information obtained from this survey can facilitate the understanding of how water flood practices are likely to influence oil production within the area of investigation.