

PRELIMINARY TEST RESULTS AND GEOLOGY OF THE DOE/SUPERIOR HULIN #1 GEOPRESSURED-GEOTHERMAL WELL, VERMILION PARISH, LOUISIANA

Chacko J. John, Donald A. Stevenson, and Charles G. Groat

ABSTRACT

The DOE/Superior Hulin #1 well is the most recent of the current three geopressured-geothermal prospects being tested by the Department of Energy (DOE) under its geopressured-geothermal program initiated in 1975. The other prospects under evaluation are Gladys McCall #1 (Cameron Parish, Louisiana) and Pleasant Bayou #2 (Brazoria County, Texas). The main objective of this research program is to evaluate the commercial viability of energy production from high temperature (275°F), geopressured, natural-gas-saturated brine sandstone aquifers occurring in the Gulf Coast area.

The DOE/Superior Hulin #1 well is located 7.5 miles (12 km) south of the town of Erath, Louisiana. It was originally drilled and later sidetracked as an exploration well by Superior Oil Company to a depth of 21,549' (6568 m) and completed in 1979. The well produced 0.3 BCF gas in nineteen months from the interval between 21,059'-21,094' (6419-6429 m). Later, due to production problems caused by tubing/casing failure, Superior abandoned production and transferred the well to DOE for testing under the geopressured-geothermal program. The well has recently been cleaned and recompleted by Eaton Operating Company, Houston, Texas and plugged back to 20,725' (6317 m). This well penetrates the deepest known Gulf Coast geopressured-geothermal reservoir and has a maximum recorded temperature of 338°F with a 560' (171 m) thick sandstone. Regional geologic work indicates that the Hulin sandstone represents either a submarine canyon or an unstable shelf delta type of environment. The well is presently perforated at the bottom of the sandstone from 20,610'-20,690' (6282-6306 m) for preliminary short term testing which is now in progress. Initial testing indicates the gas-brine ratio to be 31 SCF/STB. Preliminary log analysis indicated that free gas in addition to solution gas may be present in several zones within the target sandstone. This, if true, will aid production economics through increased gas sales. Present plans are to evaluate each zone within the sandstone by perforating upwards as testing proceeds.