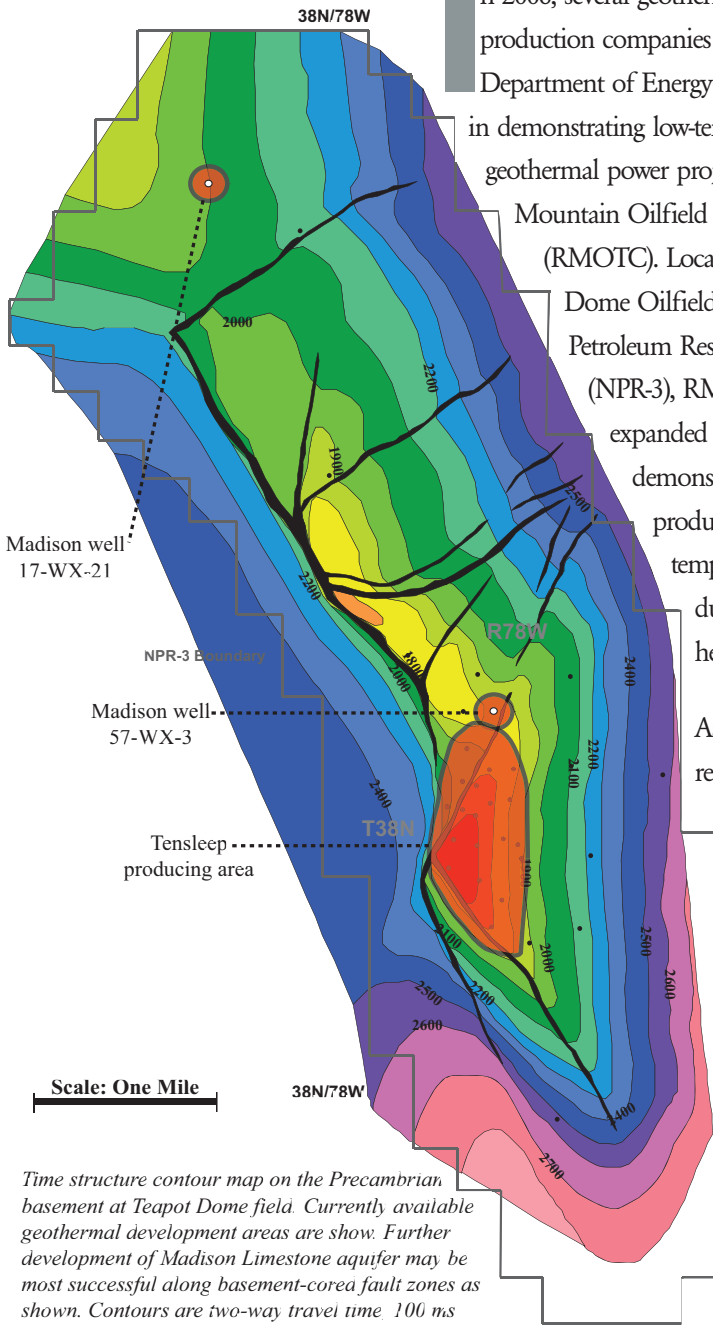




GEOHERMAL TESTING



Time structure contour map on the Precambrian basement at Teapot Dome field. Currently available geothermal development areas are shown. Further development of Madison Limestone aquifer may be most successful along basement-corea fault zones as shown. Contours are two-way travel time 100 ms contour interval.

In 2006, several geothermal power production companies and the Department of Energy expressed interest in demonstrating low-temperature geothermal power projects at the Rocky Mountain Oilfield Testing Center (RMOTC). Located at Teapot Dome Oilfield in Naval Petroleum Reserve No. 3 (NPR-3), RMOTC recently expanded its testing and demonstration of power production from low-temperature co-produced oilfield geothermal waste water.

As old oil fields reach late-stage decline, the main cost affecting the economics of continuing production is the cost of electricity to power the pumps. Yet there is latent heat energy contained in the

associated produced water that is lost by injection or discharge.

Initially, RMOTC's new projects will use 190° F water co-produced with oil, primarily from the Tensleep Formation, at depths of about 5,200 feet. Currently, like all oil fields in Wyoming, when NPR-3's produced water is disposed of, all heat energy value is lost.

An abundance of relatively fresh, hot water (180°-200°) is produced in association with the Pennsylvanian Tensleep oil. Prior to surface discharge, the water is cooled to about 60°. Water supply wells drilled to the underlying Mississippian Madison Limestone Formation have yielded rates exceeding 20,000 BWP on flow at formation temperatures projected to be about 230°. Artesian flow of the NPR-3 geothermal system is caused by forced convection of hot water at great depth recharged in the Big Horn Range located 90 miles to the northwest. The Big Horn recharge area represents a hydraulic head of about 8,000 vertical feet above the NPR-3 surface.

Pumping in the Madison Formation could increase water production rates by a factor of two to four. Fractured Precambrian basement granitic rocks at depths of 7,000 feet and more may yield substantially larger volumes of water at temperatures exceeding 250°.

Further development of the geothermal resource may result in production of deeper and hotter aquifer rocks below the oil-producing zones. The geothermal gradient of 25° per 1,000 feet of depth at NPR-3 is 9 percent higher than the average for the nearby Southern Powder River Basin.

Teapot Dome's geological structure is a typical north-west-trending Laramide asymmetrical drape fold, bounded on the west by a basement-involved blind thrust fault. Commercial oil production occurred in the early 1920s for a brief period, followed by a long shut-in period. NPR-3 was opened to full field development in 1976.

Contact

For more information about these opportunities or to discuss your testing needs, contact RMOTC toll-free at 888.599.2200, or visit the website at www.rmotc.doe.gov.

