Geothermal Potential of Oil and Gas Wells on the Fort Peck Reservation in Northeast Montana

Geothermal Energy and Waste Heat to Power: Utilizing Oil and Gas Plays
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OBJECTIVES

- Identify Suitable Existing Oil Wells for Electrical Power Generation (water flow/temperature/access)
- Identify Geothermal Potential in Undrilled Areas of Fort Peck Reservation
- Conduct Economic Feasibility Study of Power Generation and Greenhouse Heating Options on Targeted Oil Wells
Fort Peck Reservation
WHY IS THIS AREA IMPORTANT?

• COPRODUCED OIL AND GAS WELLS

• HIGH TEMPERATURE WATER – many wells over 200 F

• LARGE EXTENT – and GETTING BIGGER with MORE DRILLING

• EASY ACCESS – Wells completed, on Tribal Lands – more control over geothermal

• MADISON FORMATION – hottest water – is intercepted when drilling through to Bakken
Previous Geothermal Research on the Fort Peck Reservation

- 1979—PRC Toups
  Geothermal Space Heating Applications for the Fort Peck Indian Reservation – a DOE funded grant - relied on 1950’s data

- 2005—Black Mountain Technology
  Geothermal Power Generation Potential: East Poplar Dome Oil Field – before latest oil boom
Data Analysis--2012

• 760 bottom hole temperatures
• Precise location of drill holes
• Flow rates for existing wells
• Reinjection well locations
• Infrastructure near best wells
• Land Status – identify favorable land
• Well intercept stratigraphy
• Formation thickness
• Airborne magnetometer and EM data
• Surface geology and structure map
BOTTOM HOLE TEMPERATURES

POPLAR DOME
ROOSEVELT COUNTY

Lake Fort Peck

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GRADIENT Geophysics Ltd

Google Earth
Airborne magnetics plot with hot temps
Top Water Producing Oil Wells in East Poplar Field with BHT > 200°F

EPU 6: 209°F
Goings 27-3: 218°F
Robbins 22-15: 219°F
Huber 2: 224°F
EPU 110: 227°F
EPU 83: 230°F
EPU 1: 278°F
Highest BHT temperature

Reinjection well and storage facility
ADVANCEMENTS MADE IN OUR PROJECT

- Identified the highest geothermal temperature ever recorded in Montana: 278 F!

- Compiled nearly 90 Bottom Hole Temperatures (BHT) equal or greater than 200 F

- Identified important new areas of geothermal potential

- Evaluated significant amount of new drill hole data available from Bakken exploration
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