

***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

Southern Methodist University

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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**



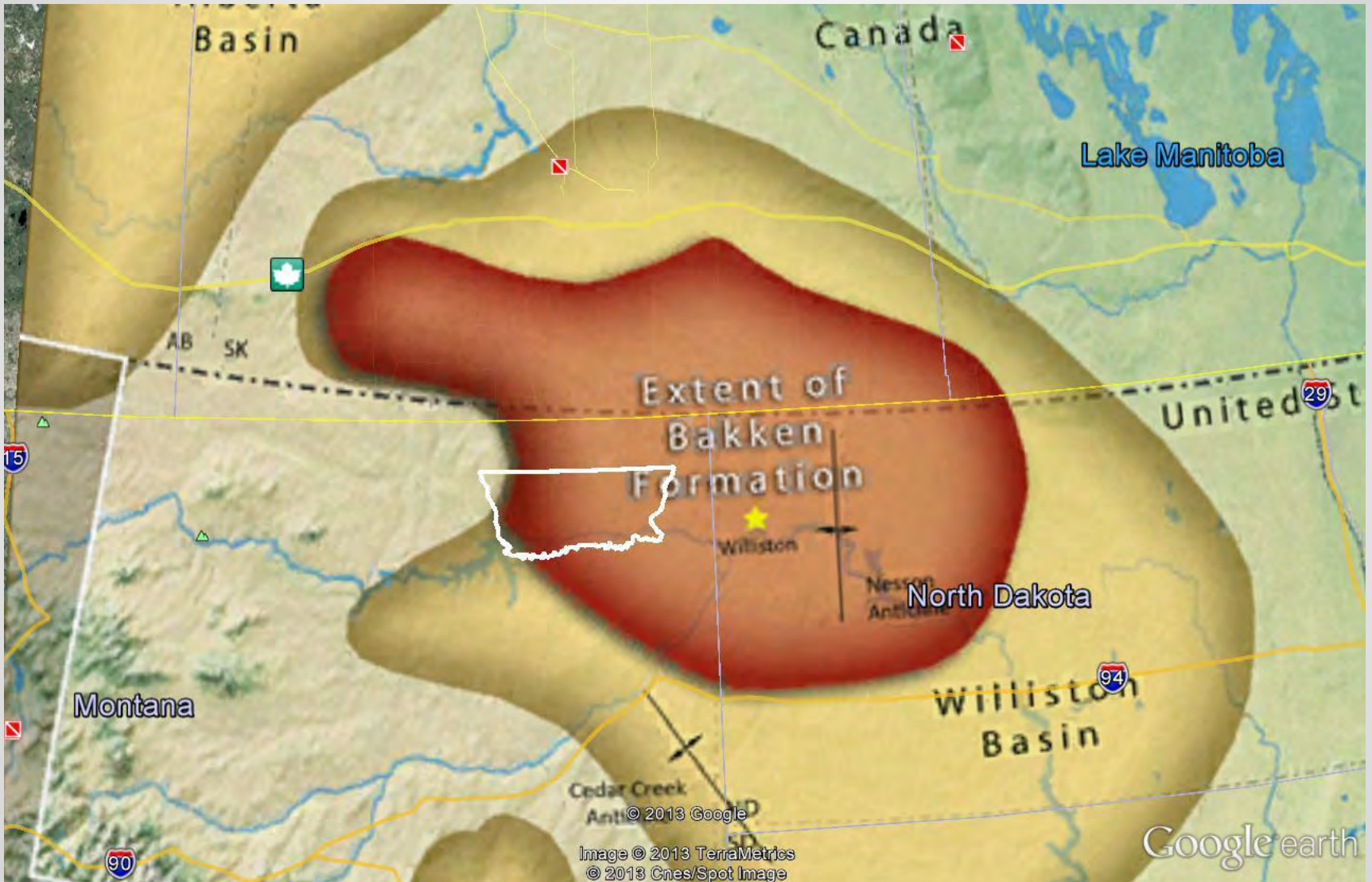
# Fort Peck Reservation



# ***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**

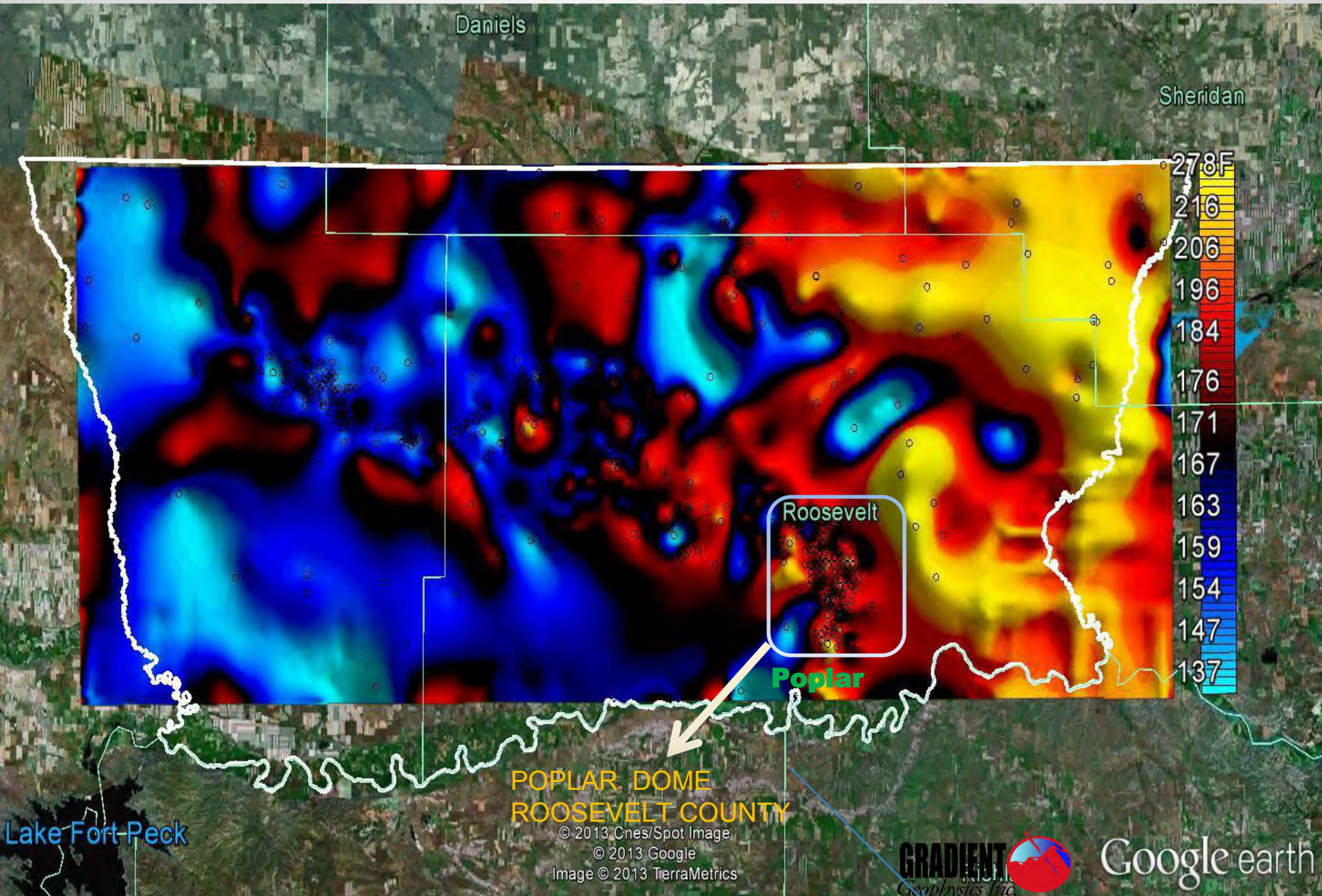
***Geothermal Power Generation Potential:  
East Poplar Dome Oil Field – before latest oil  
boom***

# ***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***

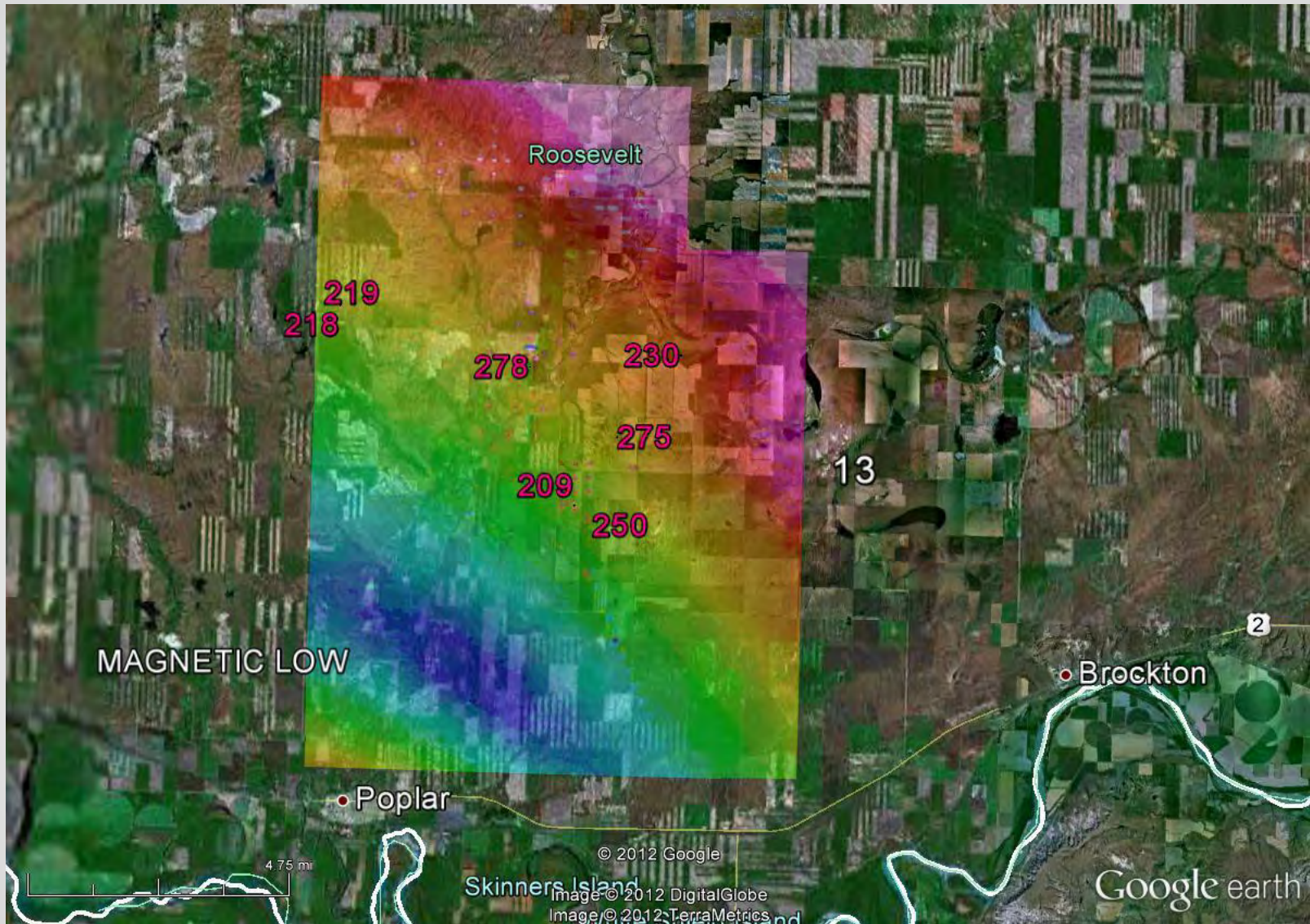


# BOTTOM HOLE TEMPERATURES

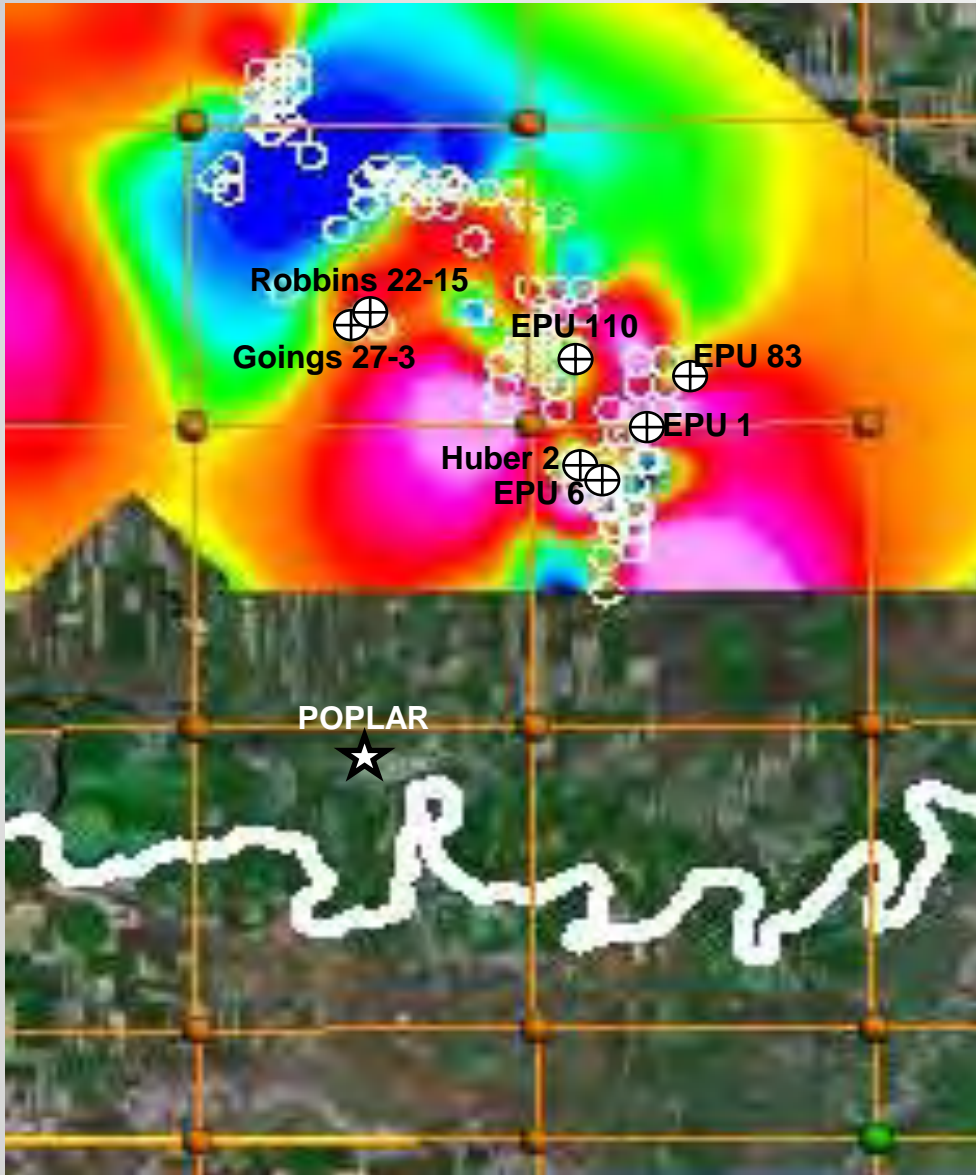




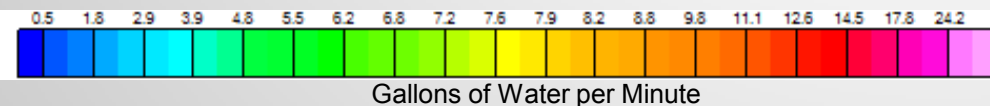
# Airborne magnetics plot with hot temps



# Top Water Producing Oil Wells in East Poplar Field with BHT > 200 F

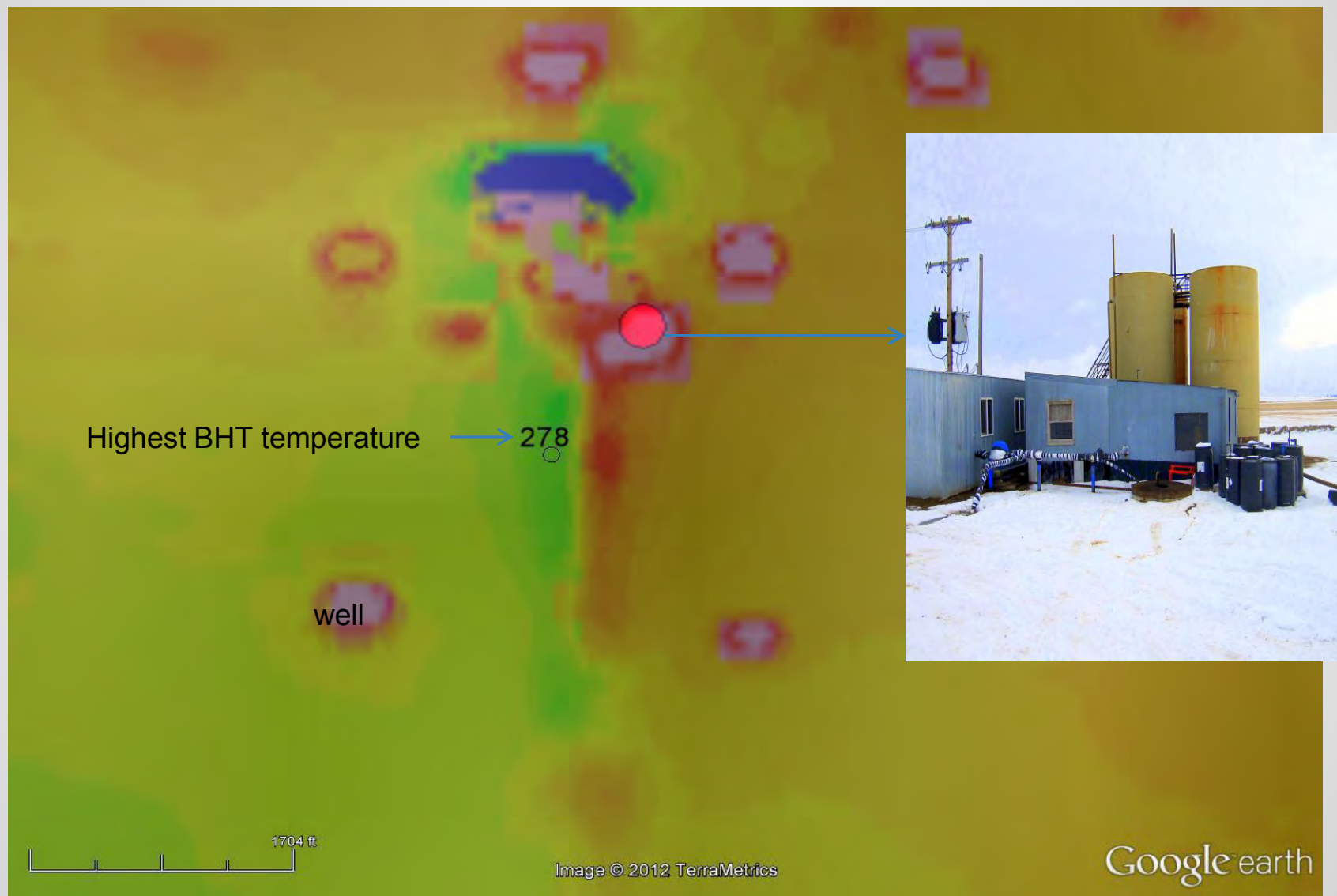


EPU 6 :	<b>209 F</b>
Goings 27-3 :	<b>218 F</b>
Robbins 22-15:	<b>219 F</b>
Huber 2 :	<b>224 F</b>
EPU 110 :	<b>227 F</b>
EPU 83 :	<b>230 F</b>
EPU 1 :	<b>278 F</b>





# PLOT OF MAGNETICS OF POPLAR DOME WELLS AND INFRASTRUCTURE (2005)



● 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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