

Comparing Temperature Data from Oil and Gas and Geothermal Logs – An AB No.1 Case Study

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ABSTRACT

Alberta No.1 (ABNo1) is developing the province's first conventional geothermal project in Alberta, Canada, near the city of Grande Prairie. The drilling area was chosen from regional studies based on Oil & Gas (O&G) Borehole Temperature (BHT) measurements and other commercial considerations such as distance to a heating load for direct-use applications and power transmission. Within this local drilling area, BHTs were found to be significantly lower than temperatures reported from other O&G sources such as Drill Stem Tests (DST). Given this large uncertainty in the temperature data, ABNo1 conducted a detailed temperature log in an existing cased and perforated disposal well owned by SECURE ENERGY. This well was the perfect candidate for temperature logging since it was drilled in March 2018 but had never been used as a disposal well. The logging was carried out by Voltage Wireline in February 2021 more than two years since the last entry into the well. The logging was carried out at the same constant speed going down and up, with 30–60-minute stops at the top and bottom of the well. Our analysis compared the geothermal temperature log with other O&G logs for this well. The O&G and geothermal logs show identical macro trends in terms of reservoir temperature (118C at 4000m) and thermal gradient (29C/km). Based on this analysis, ABNo1 has gained more confidence in the published temperature data from O&G sources other than BHTs as well as justification for the various corrections often applied to BHTs taken under O&G conditions.