Blatchford Deep Geothermal District Heating

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Deep Geothermal District Heating



Geothermal Gradients of Western Canada



From: Majorowicz, 2016

Temperatures at 1 km Depth



Existing Deep Canadian Geothermal Projects

- Mt. Meagher Project, BC, worked 1971-2019, Alterra Power, Several wells drilled, fluids of 260 C, 110 MW
- DEEP, 5 MW power, Saskatchewan, Cost \$51 million, Federal funding \$26.6 million, 3550 m deep vertical well drilled
- Alberta #1, 5 MW power, Grande Prairie, Federal funding \$25.4 million for cost of \$50 million
- Razor Energy, hybrid power project in Swan Hills, combines geothermal, waste heat and natural gas for total 5 MW, cost \$15-20M, Federal funding \$5 million, Provincial \$2 million
- Eavor, closed loop, Drayton Valley, cost \$10 million, \$6.7 million Federal funding

Devonian Carbonate Platforms



Lithostratigraphy



Cross Section Through Leduc Oil Field at Devon



From Godfrey and Langenberg, 1993

Temperatures at Depth in Devon area (only good data is from Garland & Lennox, 1961)



Two Well Open Loop (Doublet)



Leduc D3A, 2 suspended wells, injection 100 m below production, high permeability, could be economic

Estimate of Well Cost - \$2 million



Conclusions

- Devonian reservoirs have favorable porosity, permeability and thermal conductivity for geothermal exploitation
- Devonian reservoirs are at 1600 m depth at Blatchford
- Blatchford is well-suited for deep geothermal district heating
- In district heating, deep geothermal is more economic than a Geo-Exchange Field
- A doublet could be drilled for \$4 million
- Preliminary assessment indicates that the project could be financed by \$40 million