

CLEAN RESOURCES

CLEAN TECHNOLOGY

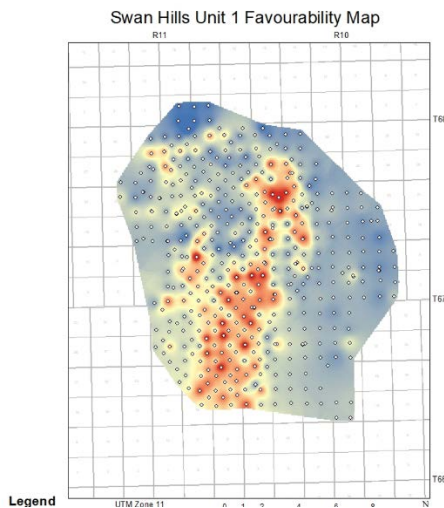
ELECTRICITY GENERATION

FUNDING DETAILS

Geothermal Power from co-produced fluids and hydrocarbon reservoirs throughout the Western Canadian Sedimentary Basin

Conventional oil processes produce a mix of oil and hot water. The hot water is typically reinjected back into the oil reservoir, however, if some of the heat was extracted before reinjection, that heat could be used for electricity production or direct heating applications. This process is called geothermal co-production.

This project will use computational methods, laboratory experiments, pilot-scale field tests, and economic assessments to de-risk geothermal co-production opportunities within Alberta. Experiments will be performed to determine the properties of geothermal fluids, test the responses of reservoir rocks to flow of varying temperature, and predict the geochemical hazards associated with various co-produced fluid geothermal scenarios. Results from this project’s experiments will significantly reduce the technical uncertainty of deploying geothermal co-production power on a commercial scale.



RECIPIENT:

University of Alberta – Dr. Jonathan Banks



PARTNERS:

**Razor Energy
Alberta Geological Survey**



TOTAL BUDGET:

\$2,126,000



AI FUNDING:

\$950,000



PROJECT DATES:

**DEC 2018 –
DEC 2021**



PROJECT TRL:

**Start: 3
End: 3**

APPLICATION

This project aims to understand the geothermal potential within existing oil and gas production throughout the Western Canadian Sedimentary Basin. We are mapping these opportunities across the basin and determining geothermal potentials based on both reservoir models and individual wellhead production capabilities. Together with Razor Energy, we are also exploring optimal methods of refurbishing oil and gas fields for geothermal energy production. The models and database developed through this project will help industry, government, and researchers quantify the opportunity for geothermal co-produced power in Alberta.



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PROJECT GOALS

- To identify all oil and gas fields in the Western Canadian Sedimentary Basin with geothermal co-production potential.
- To quantify the geothermal power potential of these fields based on reservoir volume and individual wellhead production models.
- To analyze the geochemistry of geothermal brines throughout the Western Canadian Sedimentary Basin.
- To understand the geochemical risks associated with brine circulation in a geothermal setting.
- To optimize various geothermal well designs.
- To estimate the economic costs and benefits of refurbishing oil and gas fields for geothermal energy production.
- To produce the first edition of the Geothermal Atlas of the Western Canadian Sedimentary Basin.

BENEFITS TO ALBERTA

- Providing low-carbon emission heat and electricity to Albertan homes, businesses, and industry.
- Reducing the environmental impacts of oil and gas production.
- Decreasing costs associated with oil and gas production.
- Prolonging the operating lifetime of existing oil and gas infrastructure.
- Extending of useful lifespan of existing hydrocarbon production infrastructure
- Creating diversified business opportunities for Albertan oil-field service providers.
- Developing homegrown Albertan global export technologies.
- Reducing the overall technical and economic risks of geothermal energy production throughout the Western Canadian Sedimentary Basin.



15 Publications



18 Students Trained



4-8 Project Jobs



75-100 Future Jobs



2 Patents Under Development



Enabler of Future GHG Reductions

CURRENT STATUS

OCT 2020

We have completed our localized research with Razor Energy in the Swan Hills region. We are now working full time on creating the Geothermal Atlas of the Western Canadian Sedimentary Basin, which will include a map of every oil and gas field in the basin, along with estimates of the geothermal power potential. Concurrently, we are analyzing the geochemical risks associated with circulating geothermal brines throughout the basin.