

Geomechanics of the Duvernay

Highlights from the Duvernay Project: Gas Liquids and Geomechanics

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Data | Intelligence | Expertise

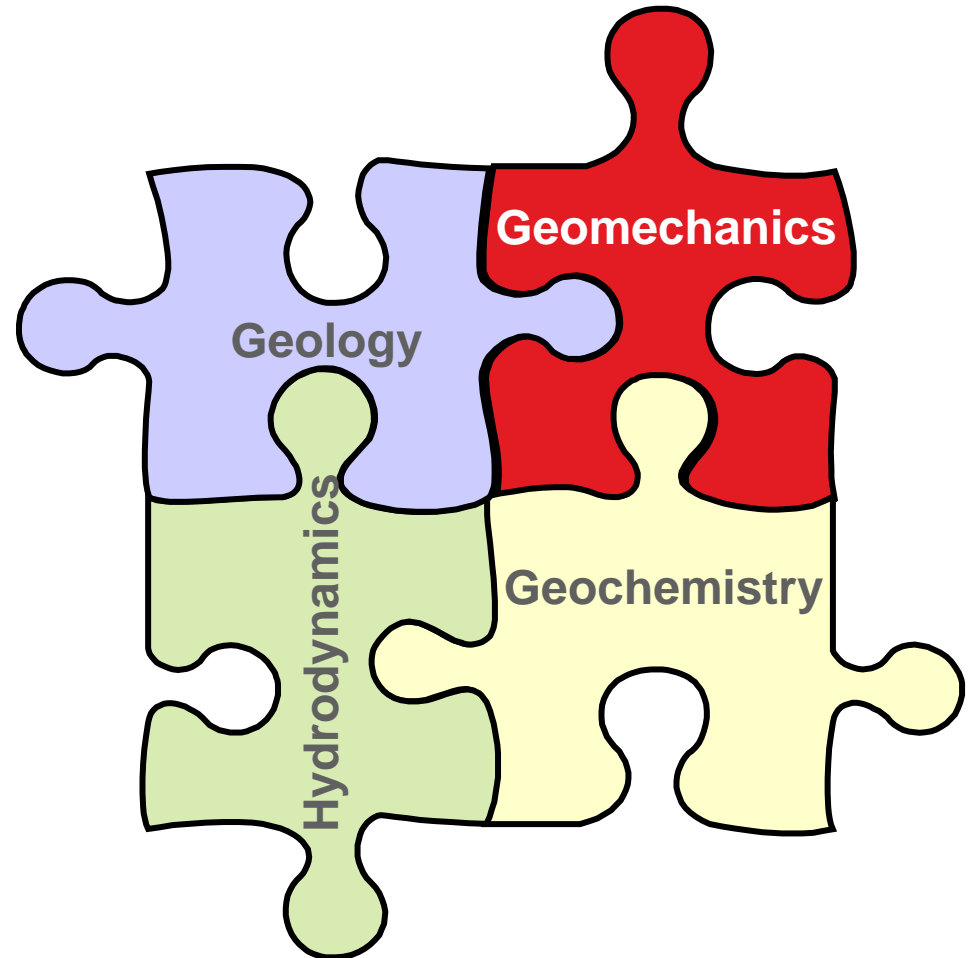
With billions of dollars invested in land purchases and capital programs, the Devonian Duvernay formation has quickly become one of North America's' hottest liquids-rich shale gas plays, with the potential for 2-5 BBLs of liquids and 150 TCF of gas* over an area exceeding 32,000m².

Drilling results to date show a wide variance in drilling & completions experience, liquids yield and gas deliverability demonstrating the complexity of this play.

Canadian Discovery's Duvernay Gas Liquids and Geomechanics studies delivers basin to wellbore scale insights on one of the most complex reservoirs in the Western Canada Sedimentary Basin.

- Geomechanics =
 - ◉ stress
 - ◉ pressure
 - ◉ rock properties
- Geomechanics affects
 - ◉ resource potential
 - ◉ drilling
 - ◉ completions
 - ◉ production

An Important Piece of the Resource Play Puzzle



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DATA

INTELLIGENCE

EXPERTISE



- The Duvernay is very heterogeneous and contains dozens of depositional parasequences as revealed by extensive geochemical work and analysis of whole core
- There is a strong correlation between geochemistry, porosity and permeability
- Fracture fabrics are extremely important and are closely tied to organic content and specific combinations of rock properties
- The play is hydrodynamically complex and influenced significantly by the Leduc reefs as well as thermal history of the basin
- In-situ stress is different in different sub-regions of the play and has a very large effect on drilling and production
- In-situ stress can be directly tied to the presence or absence of certain fracture fabrics

The Duvernay study is

- A ground-breaking regional integration of geology, hydrodynamics and geomechanics – the first of its kind in Western Canada
- A practical and rigorous review of all available data (mostly public) to explain drilling experience and production trends
- The culmination of 6,500 hours and \$1,000,000 of scientific research and development, completed in 8 months
- Delivered as
 - ◉ 8 databases
 - ◉ 29 described cores
 - ◉ 44 geomechanical drilling analysis Fawkesplots
 - ◉ 64 enclosures (maps, graphs and cross sections)
 - ◉ 34 poster montages

- Posters
 - ◉ Rock Properties
 - ◉ Image Logs
 - ◉ Drilling Experience
 - ◉ Stress Characterization
 - ◉ Wellbore Stability and SHmax Modeling
 - ◉ Two Key Wells
 - ◉ Geomechanics Summary

- Maps
 - ◉ Vertical Stress
 - ◉ Minimum Principal Stress
 - ◉ Pore Pressure
 - ◉ Effective Stress

- Appendices
 - ◉ Database of Rock Properties from Core Tests (11 wells – 10 public, 1 proprietary)
 - ◉ Logs of Calculated Rock Properties (26 wells)
 - ◉ Drilling Experience Plots (43 wells)
 - ◉ Image Log Interpretation Results (26 wells)

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