

Not all Montney is Created Equal: Characterising Montney Unconventional Resource Potential using Common Risk Segment Mapping

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Summary

Carnaby Energy has been using a Common Risk Segment (CRS) mapping workflow for new venture evaluation and land acquisition in the Montney Unconventional Resource Play, Western Canada. The resource potential of the play has been characterised by using calibrated reservoir characteristics and production performance from key wells, facies modelling using multi-attribute cross-plots, and CRS mapping for the considered key geological drivers. This characterisation has identified sweet-spots for land acquisition in the area of interest.

Introduction

Understanding regional context and having disciplined calibration is paramount in any new venture exploration project. The exceptional open-file database of British Columbia and Alberta provides an excellent example of how CRS mapping can help characterise and quantify the potential of pervasive Unconventional Resource Plays. CRS mapping is a technique often used in international new venture exploration where data and calibration points are often sparse and hydrocarbon systems are most commonly non-pervasive. We consider the CRS mapping approach to be well suited for the characterisation of Unconventional Petroleum Systems such as that found in the Lower Triassic Montney Formation of Western Canada. The approach can be applied in the exploration and characterisation of Unconventional Petroleum Systems elsewhere in Western Canada and worldwide.

Method

Carnaby Energy has focused on identifying exploration 'sweet-spots' in the emerging liquids-rich areas of the Montney Unconventional Resource Play in NE British Columbia. Over 10,000 wells with digital logs have been interpreted throughout the Montney play fairway. A sequence stratigraphic interpretation of the Montney formation was developed to isolate zones of proven and potential pay. Play element component maps, examples of which include Net Sand, Average Porosity, Net Pay, Pressure, and Condensate-Gas Ratio Yield, have been created for each zone. Each component map has been broken down into risk segments, with each segment given a perceived risk value based on its quality as calibrated to proven areas of the hydrocarbon system. The technique is applied to each identified zone within the formation. The multiplication of each component map produces a resultant CRS (sweet-spot) map. Commercial considerations such as land, infrastructure, terrain, and sensitive areas, are also kept in spatial layers and overlain over CRS maps to aid in the new venture evaluation process.

Conclusions

The availability of open-file digital well log data, and a disciplined approach of using facies and CRS mapping, has allowed a very small exploration team to characterise the Montney Unconventional Resource Play and acquire a technically driven land position in a rapidly emerging play and competitive market for land access.

Figure 1 – Area of interest and wells used in the study

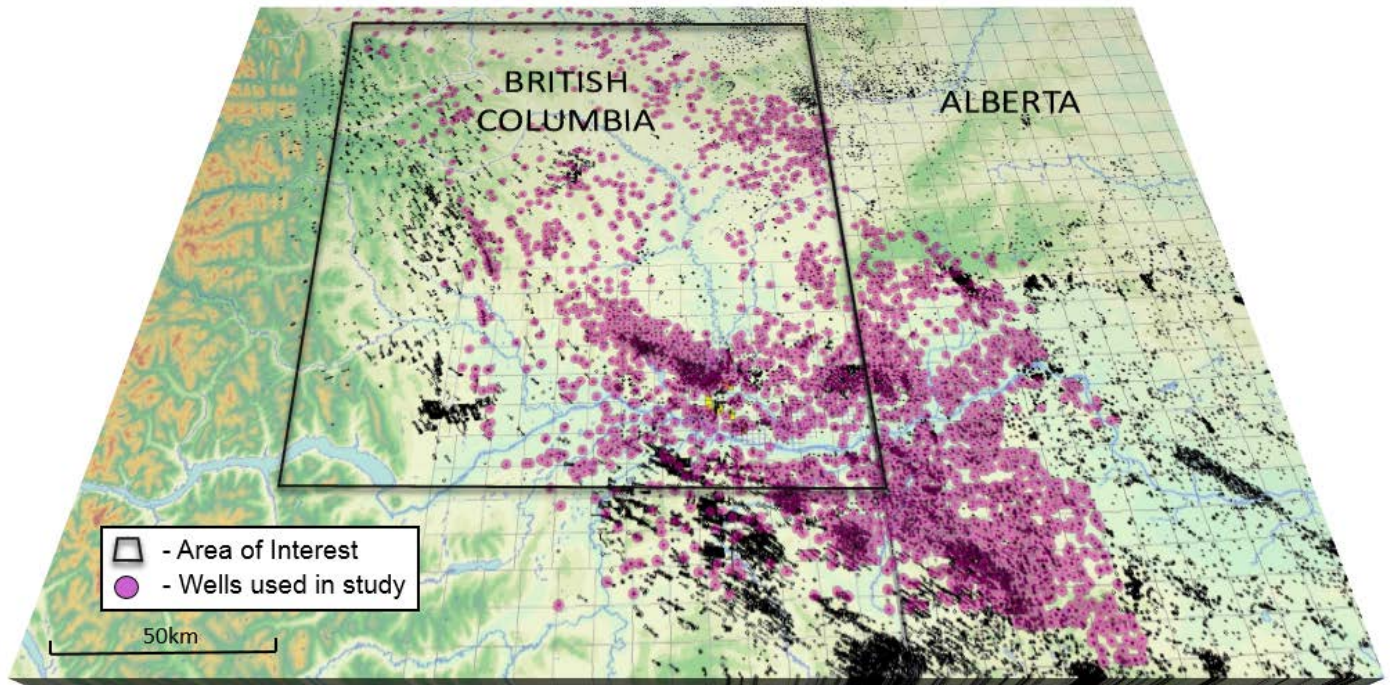
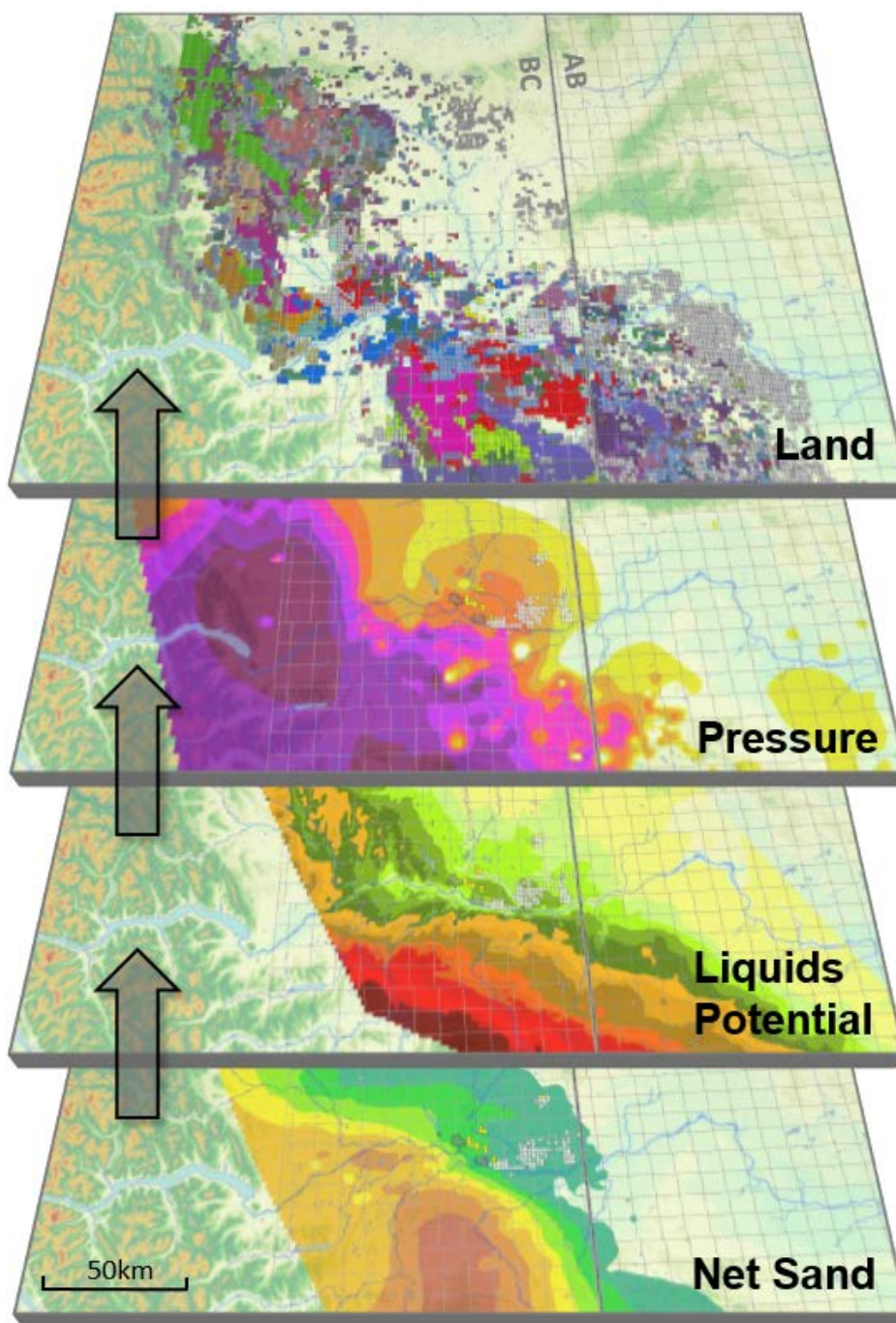


Figure 2 - Examples of play elements and spatial data used in Common Risk Segment mapping, Play Quantification, and New Venture Evaluation



Acknowledgements

Carnaby Energy is a Joint Venture between Transerv Energy (ASX) and Tamaska Oil and Gas (ASX). The author thanks the support of both companies in this work and is grateful to them for permission to present this paper.