geoconvention
Virtual Event
September 21-23
2020
CSPG • CSEG • CWLS • GAC • MAC • IAH

Identifying “Like” Rock for Future Upside

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Summary

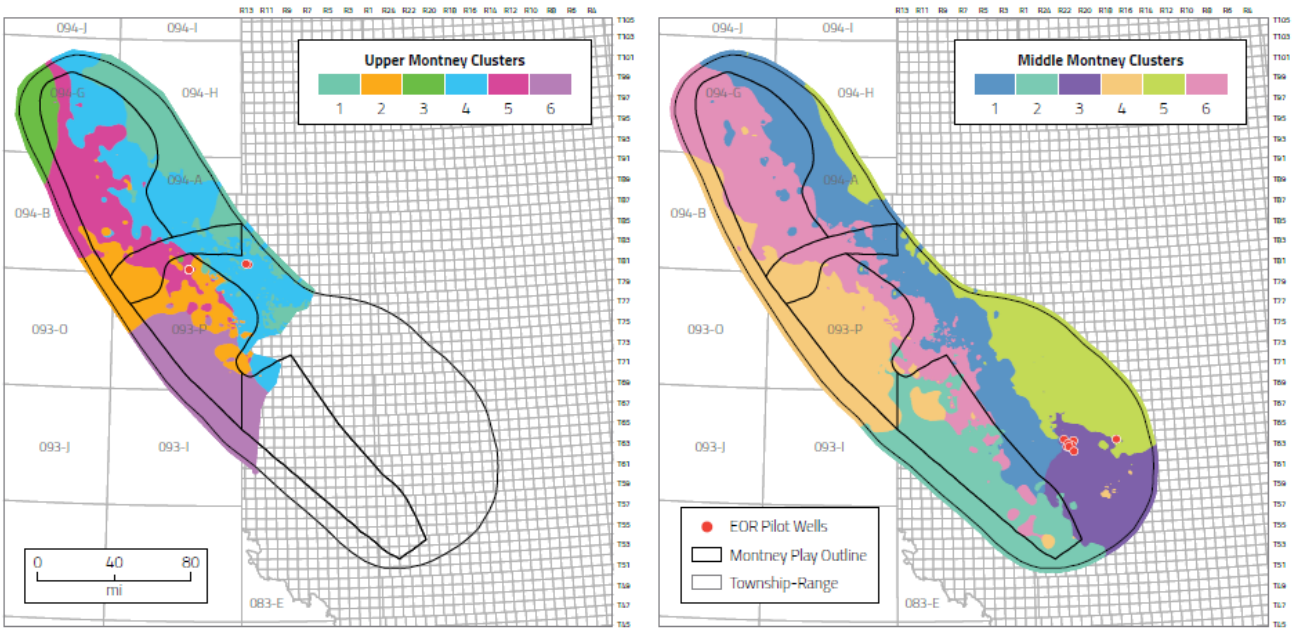
The Montney Formation is a large and prolific hydrocarbon play spanning much of British Columbia and Alberta. As operators concentrate on delivering returns to investors, they must further increase the efficiency of their operations, turning their focus to spacing, completions and new technologies. With a massive areal extent of 130,000 km^2 and reaching thicknesses of 300 m, the deposits of the Montney Formation grade from marine and distal turbidites to shorefaces (Kendall, 1999). The variability in lithology, sedimentology and the hydrocarbon window require the Montney to be broken into different reservoir regions or areas of “like” rock.

Method

This study analyzes a multidisciplinary dataset including digital logs from ~8,000 wells. As the rock itself is a vital component of operational efficiency, a cluster analysis was performed to mathematically identify similar reservoir regions. Ten geological properties averaged over the Upper and Middle Montney were incorporated into the study. Using K-means clustering and a silhouette analysis, six clusters representing regions of “like” rock were identified.

In addition to the identification of similar reservoir zones, this study compared EOR (enhanced oil recovery) licenses in the Montney. As the pilots are in the early stages, much of the data remains confidential. RS Energy Group was able to identify the four proposed EOR projects through production profiles and well license applications. The cluster analysis highlights additional operators with exposure to the geological regions with EOR pilots, identifying potential areas with similar EOR upside.

Figure 1 | Cluster Maps of the Upper and Middle Montney



Source | RSEG

Conclusions

This study utilizes cluster analysis to identify zones of similar reservoir properties, allowing operators to apply learnings such as spacing, completion or successful innovations of peers to their respective acreage.

Innovations such as EOR, historically applied to conventional reservoirs, have shown promise in unconventional reservoirs like the Eagle Ford. RS Energy Group identified four operators trialing gas EOR in the Montney. These EOR pilots fall within two of the six clusters identified in our analysis. Although too early for results, assuming the EOR pilots result in oil EUR uplift, there is potential upside for operators with offsetting acreage in these reservoir regions.

References

Kendall, D.R.(1999). *Sedimentology and Stratigraphy of the Lower Triassic Montney Formation, Peace River Basin, subsurface of northwest Alberta.* Calgary: The University of Calgary.