

## Precision Geosteering in the North Duvernay Formation

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### Summary

The Duvernay Formation in the Northern trend is a textbook example of correlation geosteering application. With consistent stratigraphy across large sections of land, it is feasible to target thin layers of rock that satisfy three criteria: highest organic content, lowest Mechanical Specific Energy needed to drill, high frackability, addressing the objective of geologists, drillers and completions teams at the same time. Such thin intervals can be mapped, and drilling is achievable through precision reservoir navigation, using MWD Gamma in traditional correlation geosteering.

### Theory / Method / Workflow

The Northern Duvernay trend is well mapped with horizontal production wells drilled across the extent of the play. Specific Mechanical Energy used is calculated from drilling parameters, and allocated to intervals in the stratigraphic column after executing a geosteering interpretation. Low MSE intervals are identified and mapped. While drilling new wells, precision geosteering allows operator to keep drill bit in tight corridors.

### Results, Observations, Conclusions

By applying precision geosteering in tight windows, drilling time is greatly reduced, lateral sections are longer, fracking is more efficient and production is better, resulting in overall higher ROI.

### Novel/Additive Information

Unconventional shale plays are attractive to operators in part because thick reservoirs provide ample space for large drilling windows, reducing need for slower sliding times. By taking a different approach, and tightening the stratigraphic window instead of opening it up and keeping the bit in brittle organic rich beds, drilling, completion and production are optimized.

### Illustrations



Fig 1: 1.5m thick window

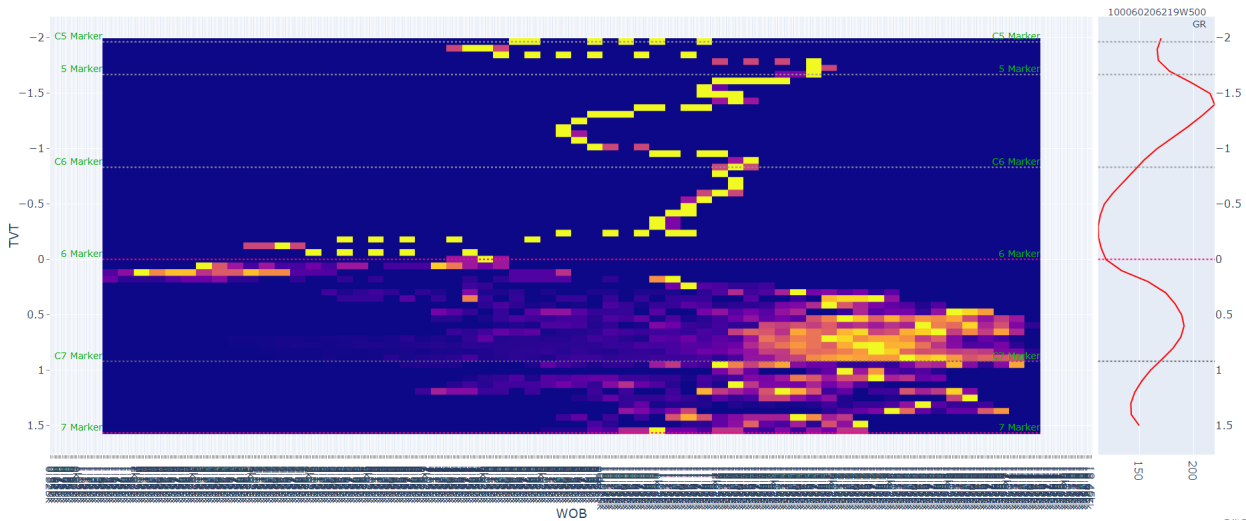


Fig 2: MSE heatmap

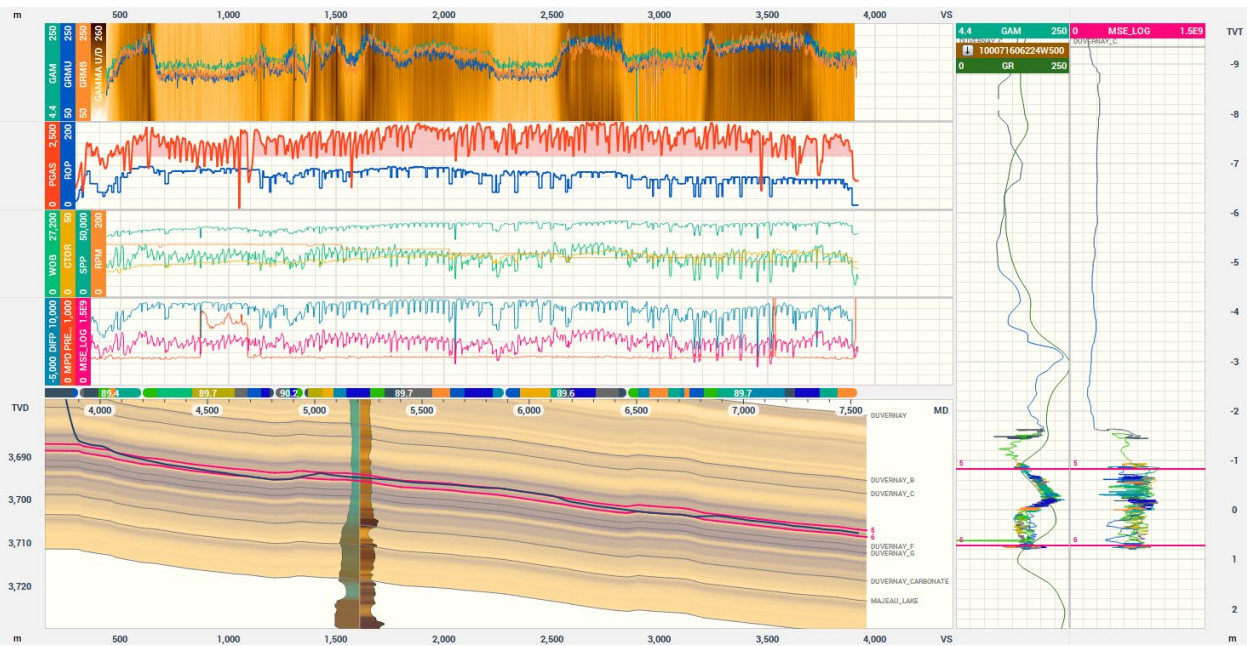


Fig 3: 2m thick window

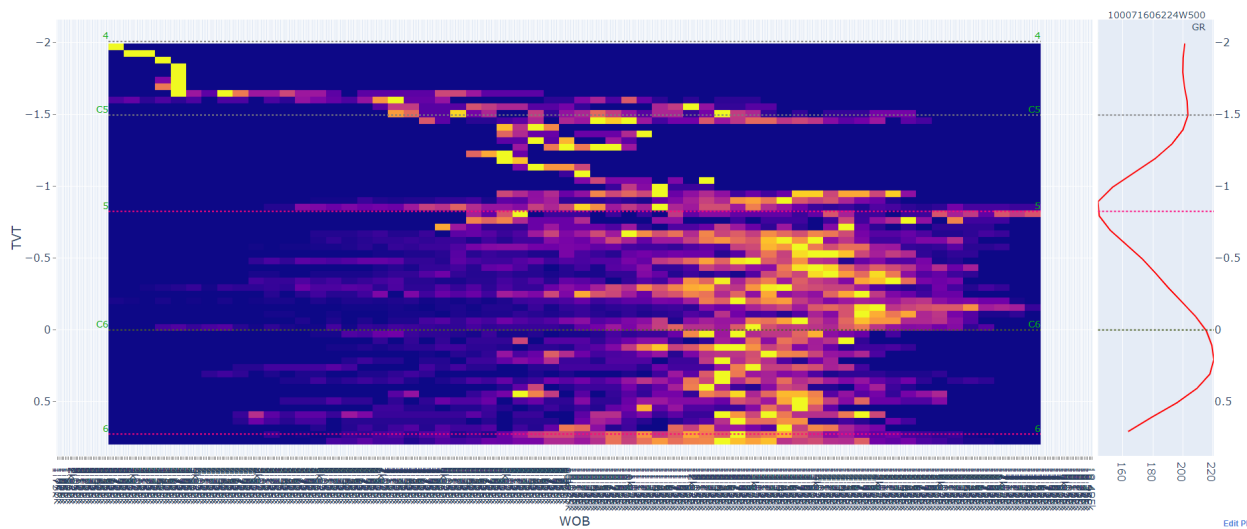


Fig 4: MSE Heatmap

## Acknowledgements

### References

MSE mapping script developed by Rogii Inc.  
Well data from B-32 Exploration