

## Introducing the Greater Kaybob Duvernay Basin: A paleogeographic to well correlation mapping project.

*Bradley T Culver P.Geoph  
B-32 Exploration Ltd.*

### Summary

The Duvernay Source rocks are considered to accrete in a restricted marine environment associated with the Waterways sub basin of the Middle Devonian (Campbell et al. 1992). During Duvernay accretion, Devonian-Frasnian time, four major cycles of high TOC have been identified and have strong ties to Photic Zone Euxinic (PZE) conditions (Kabanov et al. 2020).

Two of these cycles occur within the lower Duvernay, and two are present in the Upper Duvernay. A mapping project was initiated in 2018 for the entire Duvernay play fairway utilizing 5300 petrophysical logs over a 40,000 square mile area (Figure 1). Fault lineaments were interpreted from third order residual maps of the Cretaceous Base Fish Scales. The results of mapping the Upper Duvernay isopachs show a relationship between tectonism and thickness throughout the fairway. This relationship compartmentalizes the Duvernay into 3 distinct basins: the East Shale Basin (ESB) the West Shale Basin (WSB), and the Greater Kaybob Basin (GKB). The mapping of the Greater Kaybob Basin has received little attention in literature and requires a more complete set of stratigraphic divisions for proper interpretation of significant economic opportunities.

A detailed novel stratigraphic framework and naming convention was used using 2390 Duvernay penetrations over 16,000 square miles within the GKB. The resultant isopach maps show the direct relationships of tectonic activity within the area to accretion thickness.

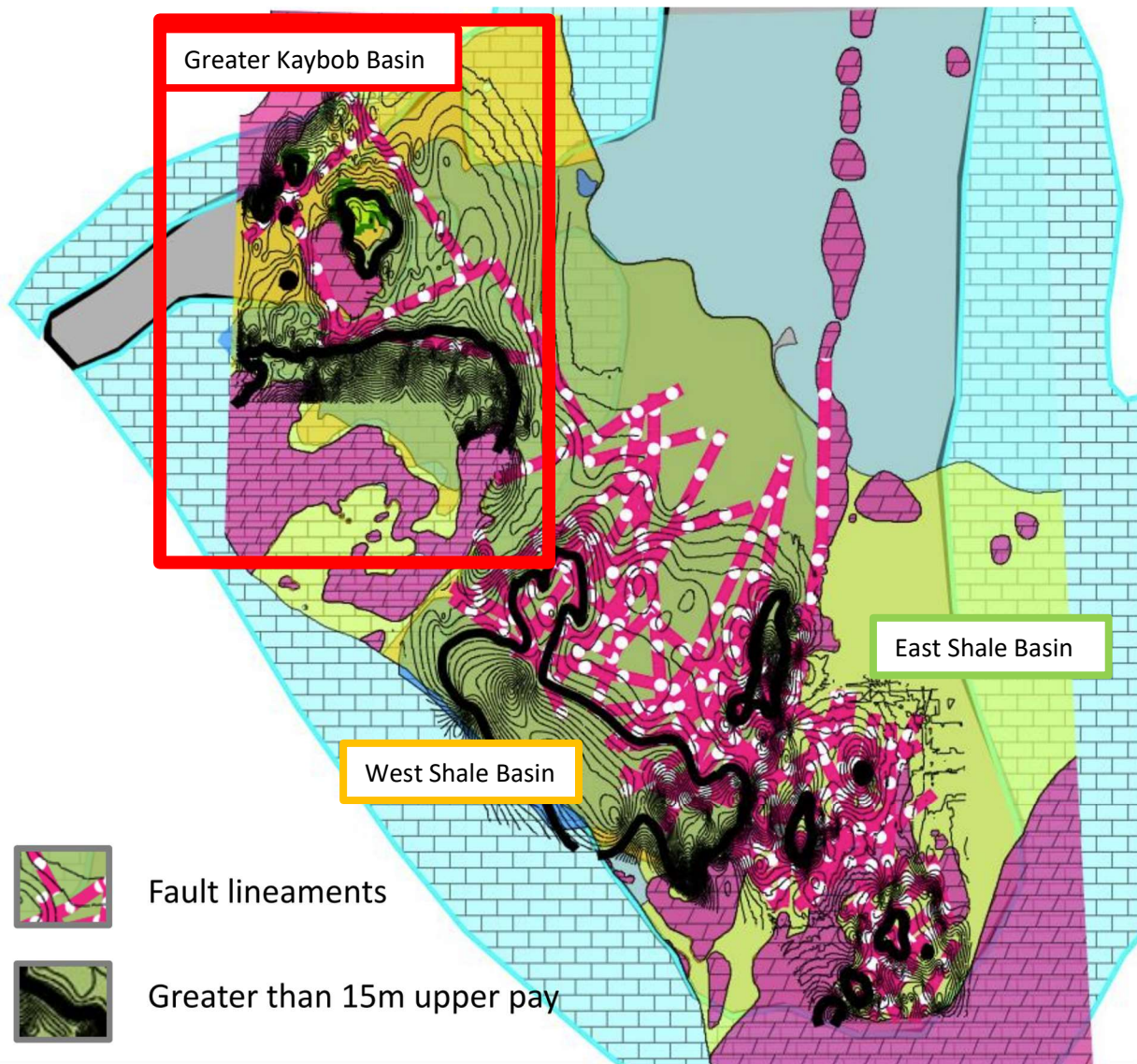


Figure 1 Upper Duvernay Reservoir extent in yellow overlying the Waterways Restricted Basin (from Campbell et al 1992 and AER/AGS Model 2018-02). Hashed pink lines are interpreted fault lineaments. Leduc dolomite reef systems are colored purple and show the relationship of faulting and Upper Duvernay pay thickness contoured in meters. Area of this presentation's interest, the Greater Kaybob Basin, lies within the red square overlay.

## References

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