

## Formation Water and Gas Geochemistry of the Sverdrup Basin

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### Summary

While formation water geochemistry in the Sverdrup Basin is highly variable, background salinities and geochemistry are consistent with a seawater origin. Local anomalies of very high salinity waters are associated with salt piercement structures. Dissolution of halite in the diapirs forms localized brines with over an order of magnitude higher concentration than average for the basin. In contrast, fresh water influx lowers salinities along the basin margins. This fresh water influx also appears to have initiated generation of biogenic gas by lowering TDS and concentrations of  $\text{SO}_4$  below levels and depressing local temperature field that would normally inhibit methanogenesis. This suggests the potential for biogenic gas plays along the basin margin, where gas may have been generated late in the basin history, similar to the Antrim shale gas play. This is consistent with regional gas geochemistry that shows stable isotope values consistent with thermogenic origin in the basin centre and more biogenic signatures on the basin margin.