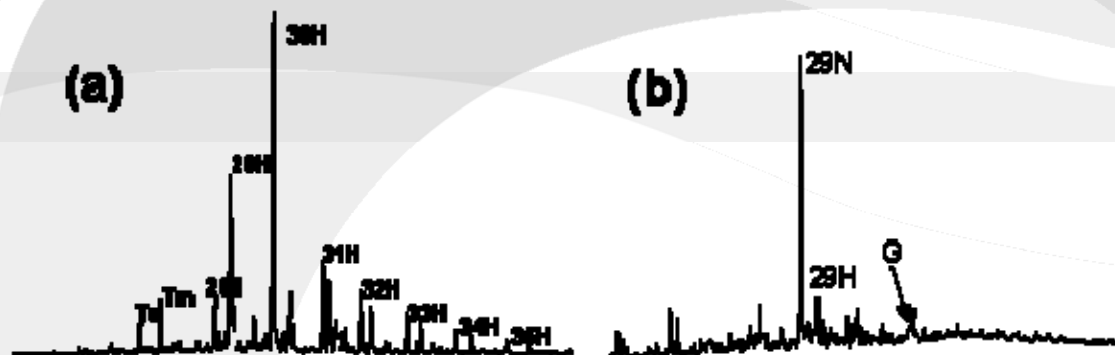




## Bitumen composition reconnaissance for the Grosmont carbonate resources

The platform carbonates of the Upper Devonian Grosmont Formation host significant quantities of bitumen, with estimates of up to 50 billion m<sup>3</sup> of bitumen in place. These petroleum resources are highly biodegraded oils, with extremely high viscosities on the order of several million centipoise, and API gravity ranging from 5 to 9°, which vary across the region. This study characterizes the heterogeneity of the bitumen composition which is a proxy for fluid properties to identify local sweet spots along north-south and east-west transects across the region\*. Based on the literature, the Grosmont bitumen represents a more biodegraded equivalent of the overlying Athabasca oil sands, showing removal of the biodegradation resistant compounds such as the hopanes (Figure 1).



**Figure 1.** Partial reconstructed mass chromatograms (m/z 191) representing (a) a full suite of hopanes and (b) a severely biodegraded hopane distribution in bitumen from the Grosmont Formation. Key: C<sub>29</sub> hopane (29H), C<sub>29</sub> 25-norhopane (29N) and gammacerane (G).

For recovery purposes, viscosity determination on this bitumen is important. Conventional approaches to measuring bitumen physical properties require mechanically extracted oil and prove problematic for carbonate-hosted bitumen due to super high viscosity. Mechanical extraction of these superheavy bitumens from the lithified carbonate reservoir is very difficult. As an alternative, the molecular geochemical composition of the bitumen may be a good indication of oil quality and oil mobility; however, there is a paucity of fluid property and hydrocarbon composition data, for these deposits. Here, we present a critique on the standard practises for recovery bitumen from

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carbonates and subsequent physical property measurements and propose a strategy that considers recently developed methodology that has been exhaustively validated employing strong QC / QA protocols.

\*Some sample locations are nearby the original pilot wells at Maclean and Buffalo Creek, where well production achieved surprising results at 500 to 750 bbls of oil per day.

The methods examined are the following:

- a) Mechanical extraction
- b)  $G_{\text{visc}}$  and  $G_{\text{API}}$
- c) Proxvisc™

Pricing for a paper copy of the Grosmont Gas report is \$25,000 (USD). If interested, please fill the order form found below. Please contact Shadenn Almadani at [reports@gushor.com](mailto:reports@gushor.com) or 709.753.8949 for additional information.

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