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Application Note (071521-1)

Shale Prospectivity Tool Utilizing Classical Pyrolysis and HAWK-PAM data

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Wildcat Technologies has developed the Shale Prospectivity Tool (SPT) which, utilizes Six Pyrolysis Attributes to Predict the Occurrence of Producing Hydrocarbons and map structures. The six pyrolysis attributes are determined through conversion of two Classical Pyrolysis rock measurements and four HAWK-PAM rock measurement's mg HC/g rock (milligram hydrocarbons per gram rock) values to their respective organic carbon using the assumption that 85% of hydrocarbons content is organic carbon.

These values are then normalized to either their respective TOC (Total Organic Carbon) or Extractable Organic Carbon (EOM) measurements (Maende et. al., 2020).

The Six Pyrolysis Attributes of the Shale Prospectivity Tool are defined as shown below:

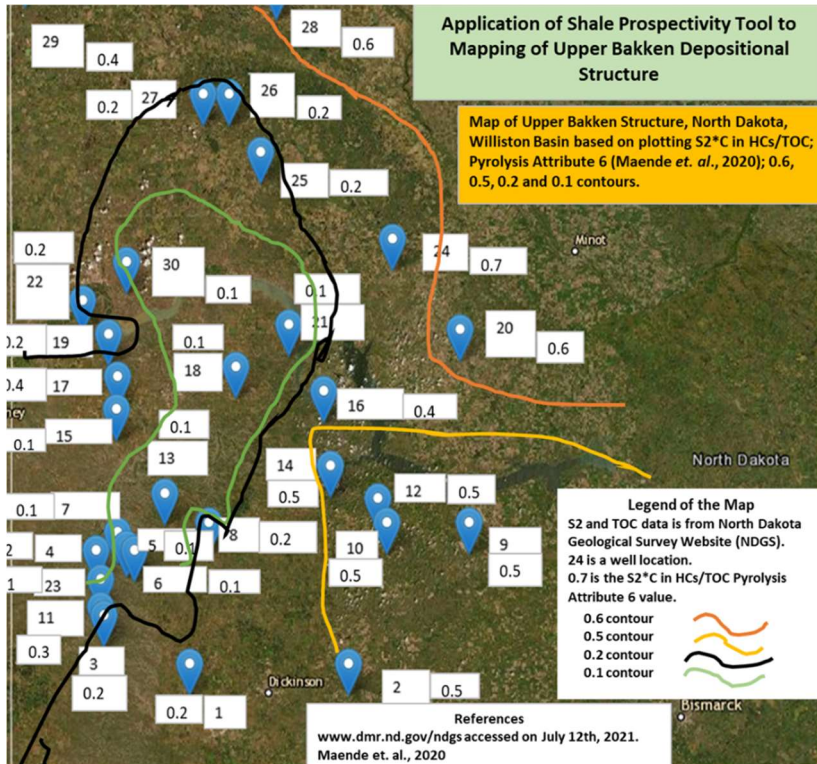
From Classical Pyrolysis:

- Pyrolysis Attribute 1: - Classical Pyrolysis' S1 organic carbon content in hydrocarbons normalized to either EOM or TOC. i.e., S1*C in HCs/EOM or TOC
- Pyrolysis Attribute 6: - Classical Pyrolysis' S2 kerogen pyrolyzed hydrocarbons normalized to either EOM or TOC. i.e., S2*C in HCs/EOM or TOC

From HAWK-PAM:

- Pyrolysis Attribute 2: Oil4 ($C_{20}-C_{36}$)*C in HCs /EOM or TOC
- Pyrolysis Attribute 3: Sum of Oil1, Oil2, & Oil3 (C_4-C_{19})*C in HCs/EOM or TOC
- Pyrolysis Attribute 4: Sum of Oil1, Oil2, Oil3 & Oil4 (C_4-C_{36})*C in HCs/ EOM or TOC
- Pyrolysis Attribute 5: Mobility Index: - Sum(Oil1, Oil2 & Oil3)/Sum(Oil1, Oil2, Oil3 & Oil4)
($C_4 - C_{19}/C_4 - C_{36}$)

Map Structures:



Reference:

Maende, A., B. Horsfield, S. Kuske, B. Jarvie, D. Jarvie and W. D. Weldon, 2020, Investigation and Identification of Pyrolysis Attributes that Can Assist in Predicting Producing Hydrocarbon in the Unconventional Eagle Ford Formation, Search and Discovery Article #80733 (2020), AAPG.

https://www.searchanddiscovery.com/documents/2020/80733maende/ndx_maende.pdf

Accessed on July 12th, 2021.