Regional Stratigraphy of the Trenton-Black River Interval

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Columbus, Ohio

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Stratigraphy Outline

• Regional stratigraphy and its importance to other tasks
• Regional Setting
• Idealized depositional profile and major facies.
• Stratigraphic framework and major lithostratigraphic units being mapped.
• Isopach maps and basin geometry
• Overview of “Sebree Trough”
• Relation of basin geometry to producing trends and other potential exploration areas.
Trenton-Black River fields and dolomitized wells
<table>
<thead>
<tr>
<th>SYSTEM</th>
<th>SERIES</th>
<th>STAGE</th>
<th>LITHOSTRATIGRAPHIC UNIT</th>
<th>CONODONT ZONES</th>
<th>GENERAL (^{13}C) EXCURSION</th>
</tr>
</thead>
<tbody>
<tr>
<td>ORDOVICIAN</td>
<td>CINN.</td>
<td>EDENIAN</td>
<td>MIDCONTINENT</td>
<td>ATL.</td>
<td></td>
</tr>
<tr>
<td>MOHAWKIAN</td>
<td>CHATTEDIAN</td>
<td>UTICA</td>
<td>Belodina confluens</td>
<td>Am. sup.</td>
<td></td>
</tr>
<tr>
<td>TURINIAN</td>
<td>BLACK RIVER</td>
<td>Trenton Limestone</td>
<td>Plectodina tenuis</td>
<td>Amorphogn tvarensis</td>
<td></td>
</tr>
</tbody>
</table>

- Trenton Limestone
- Utica Shale
- Lexington Limestone
- Black River Group
- Millbrig Diecke
Location of positive $^{13}$C excursion within the Late middle Ordovician Successions from various locations globally (from Saltzman et al., 2003)

- Millbrig K-bentonite
- Kinnekulle K-bentonite
Core location map and Middle Ordovician outcrops
Cross section network
Idealized platform to basin model and major facies
Importance of Depositional Setting and Basin Geometry

• Reservoir rocks, i.e. grainstones.
• Seismic signature on Trenton varies depending on depositional setting.
• Relationship to producing trends and potential exploration areas.
• Basin geometry may be influenced by deep-seated faulting and related to HTD.
Platform facies
Williams Co. Core 3256

Lexington Und./Trenton Ls
Logana Mbr
Curdsville Mbr
Black River
Utica

InterPlatform sub basin facies
Warren Co. Core 2627
Utica isopach
Trenton Platform

Trenton

Williams County, Core 3256
Logana Mbr., Sub-basin
Curdsville Mbr, sub-basin
Sub-Basin

2982 TRENTON/CURDSVILLE; UTICA
LITHOSTRATIGRAPHY IN, OH, KY REGION

OVERVIEW OF THE “SEBREE TROUGH ??”
Idealized platform to basin model and major facies
LEXINGTON PLATFORM

TRENTON FACIES EXTENDS TO INTERPLATFORM SUB-BASIN WHERE CURDSVILLE EXTENDS EASTWARD ABOVE THE MILLBRIG

TOPS ARE TIED TO CORE, OPEN FILE REPORTS, AND PUBLISHED REPORTS
TRENTON FACIES EXTENDS TO INTERPLATFORM SUB-BASIN WHERE CURDSVILLE EXTENDS EASTWARD ABOVE THE MILLBRIG
Idealized platform to basin model and major facies
Stratigraphic cross section Dip I-I ' from NW OH to WV
Stratigraphic cross section Dip J-J ' from ON to PA
Stratigraphic cross section Dip K-K ‘ from ON to PA
Trenton Platform

Interplatform Basin

Lexington Platform

Cross section line M-M
Stratigraphic cross section Dip M-M ' from ON to PA
Stratigraphic cross section Strike A-A’ from NW Ohio to NY
Stratigraphic cross section Strike D-D ' from KY to NY
Areas of exploration interest along platform margins

Trenton Platform

Lexington Platform

Areas of exploration interest along platform margins
Stratigraphy tasks and importance to other tasks

• Integrate major stratigraphic facies and sequences with thin section petrography to define reservoir facies.
• Integrate regional stratigraphy with C13 markers and chemically fingerprinted bentonites.
• Integrate regional facies and sequences with production maps to define producing trends.
• Integrate regional stratigraphy with regional structural features to define potential HTD trends.
• Integrate all tasks to better understand the entire petroleum system.