Where to Drill in Western Kentucky

February 7. 2008
Assumptions to Date and Questions

• Drill no more than 8,000 feet
• Drill multi-horizons (at least 2 major horizons)
• Do we want to test the Mt. Simon?
  – Will greatly control where we drill
  – Often have a thick Eau Claire section separating the Knox from the Mt. Simon
• Do we want to absolutely restrict ourselves to the Pennsylvanian limit?
• What about the earthquake limit?
Base Maps and Restriction Areas
Pennsylvanian at Surface

(Excludes contiguous areas covered by Quaternary deposits)

Western Kentucky Coal Field
Earthquake Hazard Area

Peak acceleration of 30%g or more with 2% probability of exceedance in 50 years based on USGS Seismic Hazard Mapping Project
Distribution and Drilling Depths
Drilling Depth to Top Precambrian

Calculated using DEM - Structure

Legend

Drill Depth to Top Feet

Deep: >29,000 ft
Shallow: <3000 ft

Preliminary, subject to change
Basement Depth 8,000 ft or Less

Preliminary, subject to change
Drilling Depth to Top Mt. Simon

Legend
MTSM Drill Depth
Feet
High : >14,000
Low : <3,000

Drilling Depth to Mt Simon = 8,000'

Preliminary, subject to change
Drilling Depth to Top Knox

Legend
KNOX Drill Depth Value
- Deep: >9,000
- Shallow: <1,000

Drilling Depth to Knox = 2,500’
Drilling Depth to Top St. Peter

Legend
STPR Drill Depth
Feet
High : >9,000
Low : <500

Drilling Depth to St Peter = 2,500’
Western Kentucky Stratigraphic Units with CO₂ Storage Potential

- **Potential CO₂ sinks/reservoirs**
- **Caprock containment interval**
- **Unconformity**
- **Sink or seal**
  - (depends on location)
- **Basement Metamorphic and igneous rocks**
  - (mostly seal)
Drilling Depth Estimates in Nine Counties in Western Kentucky
Updated* Seismic Interpretation of Formation Depths

• Raw data shown: does not imply precision
• Accurate as reasonably possible based on seismic velocities
• Surface elevation based on seismic datum
• Middle Run is a known drilled Precambrian sedimentary unit in eastern Kentucky; not drilled in western Kentucky

* Updated as of Feb. 2008
Location of Potential Wells

Based on updated interpretation of proprietary seismic data

Follow along on spreadsheet
Union County (U)

Depth of Top (t) and Thickness (th) in feet

<table>
<thead>
<tr>
<th>t Kn</th>
<th>th Kn</th>
<th>t EC</th>
<th>t MS</th>
<th>th MS</th>
<th>t B</th>
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<tbody>
<tr>
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Henderson County (H)

Depth of Top (t) and Thickness (th) in feet

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Based on proprietary seismic data
Daviess County (D)

Depth of Top (t) and Thickness (th) in feet

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Based on proprietary seismic data
Hancock County (H1)

Depth of Top (t) and Thickness (th) in feet

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Based on proprietary seismic data
Breckinridge (B)

Depth of Top (t) and Thickness (th) in feet

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Based on proprietary seismic data
Based on proprietary seismic data

Ohio County (O)

Depth of Top (t) and Thickness (th) in feet

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Based on proprietary seismic data
Based on proprietary seismic data
Based on proprietary seismic data
Butler County 2 (B-2)

Depth of Top (t) and Thickness (th) in feet:

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Based on proprietary seismic data.
Logan County (L)

Depth of Top (t) and Thickness (th) in feet

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Based on proprietary seismic data
Where

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