**Geology and Geochemistry**

**Panel II**

**Jefferson State 4-1 Well**

Core graph from portion of Jefferson State 4-1 well (section feet).

Gas-filled porosity and permeability values are on the low end of the shale reservoir quality spectrum.

**Mule 31-K Well**

As-Received Grain Density

**Thin Sections**

***Gothic shale is fairly monotonous but***

Core graph from portion of Jefferson State 4-1 well (section feet).

**Gas-Filled Porosity and Permeability Values**

**Geochemistry**

<table>
<thead>
<tr>
<th>Zone</th>
<th>TOC</th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>Tmax</th>
<th>PI</th>
<th>Calculated PI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hovenweep</td>
<td>0.05</td>
<td>0.03</td>
<td>0.10</td>
<td>0.23</td>
<td>473</td>
<td>193</td>
<td>453/60</td>
</tr>
<tr>
<td>Gothic</td>
<td>0.46</td>
<td>0.79</td>
<td>0.44</td>
<td>0.63</td>
<td>397</td>
<td>95</td>
<td>138/172</td>
</tr>
<tr>
<td>Chimney Rock</td>
<td>1.39</td>
<td>1.49</td>
<td>2.12</td>
<td>0.56</td>
<td>442</td>
<td>152</td>
<td>40/107</td>
</tr>
</tbody>
</table>

**Gas Saturation**

**Rock-Eval Pyrolysis**

- **S1** is the amount of CO2 (in milligrams CO2 per gram of rock) produced during pyrolysis (top of S1 peak).
- **S2** is the amount of CO2 (in milligrams CO2 per gram of rock) produced during pyrolysis (top of S2 peak). **Tmax** is an indication of the stage of maturation from cracking of kerogen occurs during pyrolysis (top of S2 peak). **PI** is the production index (PI = S1/[S1 + S2]).
- **HI** is the hydrogen index (HI = [100 x S2]/TOC).
- **OI** is the oxygen index (OI = [100 x S3]/TOC).