OUR US OILPATCH TOMORROW

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LESS MARGIN FOR SUPPLY INTERRUPTIONS

**Little to Spare**
The Organization of the Petroleum Exporting Countries’ ability to respond when oil supplies fall has dwindled in recent years.

**OPEC's spare crude oil-production capacity**
Millions of barrels a day, quarterly data

- 2016 2Q: 1.5 million

**Oil-production outages for May 2016**
Millions of barrels a day

- **OPEC**
  - Nigeria: 0.7
  - Libya: 0.5
  - Neutral zone: 0.5
  - Venezuela: 0.3
  - Iraq: 0.1
  - Iran: 0.1

- **NON-OPEC**
  - Canada: 0.6
  - Syria: 0.1
  - South Sudan: 0.1
  - Other: 0.3

Total: 3.4 million

*Numbers may not add up due to rounding
†Neutral zone: An area between the borders of Saudi Arabia and Kuwait
‡Includes Colombia, Ghana, Italy, North Sea and Yemen
Sources: Energy Information Administration (capacity); Energy Aspects (outages)
HYDROCARBON CONSUMPTION GROWING

Cheap Gasoline = More US Driving in Bigger Vehicles

U.S. Gasoline Consumption

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HOW BIG IS THE DOMESTIC PRIZE?
Eagle Ford Overall Developed Acreage
25% Overall at 80 Acres, 33% Net Economic Barrel at 80 Acres
12.5% at 40 Acres, 16.5% at 40 Acres

<table>
<thead>
<tr>
<th>Variable</th>
<th>Value</th>
<th>Suggested</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lateral Length (ft)</td>
<td>5.626</td>
<td>5.974 79</td>
<td>Sets lateral length for future wells. Lateral length for existing wells is based on actual lateral lengths. Suggested value represents average of all lateral lengths in the play.</td>
</tr>
<tr>
<td>Wellbore Spacing (ft)</td>
<td>660</td>
<td>330, 660, or 1320</td>
<td>Sets wellbore spacing distance for all wells, including existing wells.</td>
</tr>
<tr>
<td>Land Efficiency Factor (%)</td>
<td>90 %</td>
<td>90 %</td>
<td>Total land area is reduced by this percentage to account for unleaseable acreage and bypassed acreage due to wellbore and lease geometry inefficiencies</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Play</th>
<th>Grade</th>
<th>Total Land Area (mi^2)</th>
<th>Proportion of Play (%)</th>
<th>Cum Play (%)</th>
<th>Wells Drilled</th>
<th>Lateral Length (ft)</th>
<th>Land Area Drilled (mi^2)</th>
<th>Land Drilled (%)</th>
<th>Remaining Wells</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gulf Co.</td>
<td>A</td>
<td>354</td>
<td>2</td>
<td>2</td>
<td>2,062</td>
<td>5,360</td>
<td>290.7</td>
<td>82.1 %</td>
<td>1,003</td>
</tr>
<tr>
<td>Gulf Co.</td>
<td>B</td>
<td>433</td>
<td>3</td>
<td>6</td>
<td>1,976</td>
<td>5,476</td>
<td>204.6</td>
<td>65.7 %</td>
<td>1,003</td>
</tr>
<tr>
<td>Gulf Co.</td>
<td>C</td>
<td>545</td>
<td>7</td>
<td>13</td>
<td>2,988</td>
<td>5,938</td>
<td>466.7</td>
<td>49.4 %</td>
<td>1,003</td>
</tr>
<tr>
<td>Gulf Co.</td>
<td>D</td>
<td>1,763</td>
<td>13</td>
<td>27</td>
<td>3,206</td>
<td>6,134</td>
<td>517.3</td>
<td>29.5 %</td>
<td>1,003</td>
</tr>
<tr>
<td>Gulf Co.</td>
<td>E</td>
<td>2,947</td>
<td>22</td>
<td>50</td>
<td>4,950</td>
<td>6,267</td>
<td>816.0</td>
<td>27.7 %</td>
<td>1,003</td>
</tr>
<tr>
<td>Gulf Co.</td>
<td>F</td>
<td>2,472</td>
<td>19</td>
<td>69</td>
<td>1,457</td>
<td>6,342</td>
<td>248.1</td>
<td>10.0 %</td>
<td>1,003</td>
</tr>
<tr>
<td>Gulf Co.</td>
<td>G</td>
<td>1,531</td>
<td>15</td>
<td>84</td>
<td>367</td>
<td>6,287</td>
<td>60.7</td>
<td>3.1 %</td>
<td>1,003</td>
</tr>
<tr>
<td>Gulf Co.</td>
<td>H</td>
<td>966</td>
<td>7</td>
<td>91</td>
<td>72</td>
<td>5,391</td>
<td>10.2</td>
<td>1.1 %</td>
<td>1,003</td>
</tr>
<tr>
<td>Gulf Co.</td>
<td>I</td>
<td>379</td>
<td>2</td>
<td>94</td>
<td>18</td>
<td>5,336</td>
<td>2.6</td>
<td>0.7 %</td>
<td>1,003</td>
</tr>
<tr>
<td>Gulf Co.</td>
<td>J</td>
<td>653</td>
<td>5</td>
<td>99</td>
<td>13</td>
<td>5,150</td>
<td>1.8</td>
<td>0.3 %</td>
<td>1,003</td>
</tr>
</tbody>
</table>
NORMALIZING PRODUCTION MAPPING

• Desire to create a predictive production map as though every well was drilled and completed the same
• How do we do this in a robust and repeatable way?

*Actual 12 month Cum Oil*

*Predicted 12 month Cum Oil*
We know it is improvable... so what is the component ROI of doing so?

PREDICTED PRODUCTION MAPS BASED ON TIER 2 DUNN & MCKENZIE NON-LINEAR REGRESSION MODEL

This shows the revenue difference between the 700 lbs/ft model and the 400 lbs/ft model

Assuming:
- 10,000 ft laterals
- $0.20/lb of proppant
- $40/bbl return for oil

Red: ~$2MM+ gain
Cyan: ~$50k gain
Dark blue & purple: revenue loss
50% Better?
PROVEN: THESE IMPROVEMENTS ARE ACHIEVABLE

EAGLE FORD-
USGS: 5.1 BBOE Economically Recoverable Reserves
PRODUCED TO DATE: 2.1 BBOE
EUR of WELLS DRILLED TO DATE: 3.1 BBOE
PERCENT DRILLED: CASE 1. 33%= 9.3 BBOE; CASE 2. 16.5%= 18.6 BBOE
OPERATOR IMPROVEMENT: CASE 1. 12.4 BBOE; CASE 2. 25.35 BBOE
BOE/SQ MI: 4-11 MMBOE; 43.3 BBOE – 119 BBOE (20-28% Recovery)

PERMIAN BASIN-
12x thicker source, 7x larger surface area (12x7=84)
BOE/SQ MI: 50-180 MMBOE; so inline with more measured source

12.4 BBOE x 84 = 1,041 TBOE RECOVERABLE
25.35 BBOE x 84 = 2,129 TBOE RECOVERABLE

SAUDI ARABIA- 268 BBOE
VENEZUELA- 297 BBOE
WHAT IS UPSTREAM OIL & GAS ACTIVITY AND HOW WILL IT EFFECT SUPPLY?
23-24% Better

Oil and Gas 20:1

Oil and Gas 6:1

Oil

Gas
2000 FORWARD US PRODUCTION DETAILS

End 2010: 3,648,915 BOPD
End 2011: 4,224,195 BOPD
End 2012: 5,325,444 BOPD
End 2013: 6,278,764 BOPD
End 2014: 7,922,419 BOPD
End 2015: 7,260,184 BOPD

Delta ~600k BOPD
US New Drilling Gross Productivity

Contributed to 2015
Contributor to 2016

June 2016

~20% decrease in new productivity
along w/ DUCs yielded flat to slightly negative 2016 production

1st 7 months of wells that contribute to new 2016 production indicate an additional ~18% decrease in new productivity ...

Expect a "stairstep" decline of an additional 25% in Aug/Sept as Feb/March wells are cycled in...

Data derived from www.diindex.com
Drilling Rigs, Last 12 Months.

Midland and Delaware Gravitational Pull
For every company dropping rigs, there are 3.5 adding…

+39
SEPD (Best Fit)
30-39k BO
30% variation…
Next Best - ARPS
98K-111K
14% variation...
3rd Choice - DUONG 80K-104K

30% variation...
THANK YOU