NORTH DAKOTA
DEPARTMENT OF MINERAL RESOURCES:

OIL & GAS 2019

April 2, 2019 | Williston API

Visit Us: www.dmr.nd.gov
### Wells

<table>
<thead>
<tr>
<th>Category</th>
<th>Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Active</strong></td>
<td>33,609</td>
</tr>
<tr>
<td>Conventional</td>
<td>15,397</td>
</tr>
<tr>
<td>Bakken/Three Forks</td>
<td>1,706</td>
</tr>
<tr>
<td><strong>Inactive</strong></td>
<td>1,517</td>
</tr>
<tr>
<td>$&gt;50 for 90 days Jan 2019</td>
<td></td>
</tr>
<tr>
<td><strong>Waiting on Completion</strong></td>
<td>867</td>
</tr>
<tr>
<td>$+$55 for 90 days Feb 2019</td>
<td></td>
</tr>
<tr>
<td><strong>Permitted</strong></td>
<td>1,880</td>
</tr>
<tr>
<td>$+$60 for 90 days</td>
<td></td>
</tr>
<tr>
<td><strong>Increase Density</strong></td>
<td>13,948</td>
</tr>
<tr>
<td>Approved 03/31/19</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>33,609</td>
</tr>
</tbody>
</table>

**Estimated Final**
- $60/BO = 60-70 rigs = 20 Yr
- $80/BO = 70-80 rigs = 70 Yr

**Total Estimated Wells**
- 40,000 wells
- 85,000 wells
PRODUCING WELLS
DRILLING RIGS
PRODUCTION
INNOVATION
PRICE-RIGS-WELLS-JOBS PROJECTION
2019 LEGISLATURE - REGULATORY
DMR RULE CHANGES
PRODUCING WELLS
DRILLING RIGS
PRODUCTION
INNOVATION
PRICE-RIGS-WELLS-JOBS PROJECTION
2019 LEGISLATURE - REGULATORY
DMR RULE CHANGES
North Dakota Daily Oil Produced and Price

All-time high
1,402,741 barrels/day
December 2018
North Dakota Oil Production Forecast
Assumes Current Technology – Enhanced Oil Recovery Not Included

Williston Basin Oil Production & Export Capacity, BOPD
Assumes Current Technology – Enhanced Oil Recovery Not Included

Production forecast is for illustrative demonstration purposes only and should not be considered accurate for any near or long term planning.
**NDPA North Dakota Gas Production Forecast**

Assumes Current Technology – Enhanced Oil Recovery Not Included

![Graph showing NDPA North Dakota Gas Production Forecast](image)

**Simplified Example NB Calculations**

Conclusion: If no other gas export options open and all other deliveries on other pipelines stay static, ND gas production could increase 1.15-1.46 BCFD (from Nov-18) before Northern Border is 100% Bakken production. RTU management becomes increasingly important for Bakken residue gas.

![Graph showing Simplified Example NB Calculations](image)

**Solving the Flaring Challenge**

Assumes Current Technology – Enhanced Oil Recovery Not Included

![Graph showing Solving the Flaring Challenge](image)
North Dakota Captured* NGL’s

### All Natural Gas Liquids
- **2017**: 1,163,274 BPD
- **2022**: 1,659,000 BPD
- **2027**: 1,867,500 BPD
- **2032**: 2,051,000 BPD
- **2037**: 2,230,500 BPD
- **2042**: 2,400,000 BPD

### Ethane
- **2017**: 611,700 BPD
- **2022**: 687,300 BPD
- **2027**: 763,000 BPD
- **2032**: 839,000 BPD
- **2037**: 915,000 BPD
- **2042**: 991,000 BPD

### Propane
- **2017**: 587,736 BPD
- **2022**: 690,917 BPD
- **2027**: 834,000 BPD
- **2032**: 978,000 BPD
- **2037**: 1,122,000 BPD
- **2042**: 1,266,000 BPD

### Butane
- **2017**: 102,564 BPD
- **2022**: 152,510 BPD
- **2027**: 202,456 BPD
- **2032**: 252,402 BPD
- **2037**: 302,348 BPD
- **2042**: 352,294 BPD

### Isobutane
- **2017**: 61,137 BPD
- **2022**: 75,062 BPD
- **2027**: 90,986 BPD
- **2032**: 106,911 BPD
- **2037**: 122,836 BPD
- **2042**: 138,761 BPD

### Natural Gasoline
- **2017**: 57,396 BPD
- **2022**: 67,391 BPD
- **2027**: 77,386 BPD
- **2032**: 87,381 BPD
- **2037**: 97,376 BPD
- **2042**: 107,371 BPD

*Non-flared NGL’s & Assumes 10 GPM*

---

NGL Pipeline Takeaway Options

- Northern Border (ND Prod.)
- WBI Transmission
- Aux Sable Prairie Rose
- Alliance Tioga Lateral
- ONEOK Bakken NGL
- Vantage
- ONEOK Elk Creek
- Elk Creek Expansion (Proposed)
- Case 1: All Captured NGLs
- Case 2: All Captured NGLs
PRODUCING WELLS
DRILLING RIGS
PRODUCTION
INNOVATION
PRICE-RIGS-WELLS-JOBS PROJECTION
2019 LEGISLATURE - REGULATORY
DMR RULE CHANGES
North Dakota Average Monthly Rig Count

Record High: 218 Rigs May 2012

Current: 66 Rigs Well/rig/Mo 3X
Statewide Oil Performance

Cumulative Oil Production, BBL

Production Month

~12% Improvement Over 2017

IP Year
- 2018
- 2017
- 2016
- 2015
- 2014
- 2013
- 2012
- 2011
- 2010
- 2009

Statewide Initial Oil Production Rates – 24hr

Avg. 24hr Initial Production (IP) Oil - BOPD

2014 - 2019
Statewide Gas Performance

Statewide Initial Gas Production Rate: 24hr
HB 1383 & SB 2261 Mitigation
HB 1480 Flared Gas Solutions - failed 13:33
HCR 3013 Spacing and Pooling = Eminent Domain - failed 8:33
SB 2211 Trust Lands OHWM Ownership Determination
SB 2332 Increased Flaring Restrictions - failed 15:32
SCR 4010 Royalty Deductions Study - passed

HB 1014 DMR Budget
HB 1290 Prohibit Entry & Search of Buildings and Land – failed 4:43
HB 1439 Extraction Tax Incentive for Captured CO2
SB 2037 High Level Radioactive Waste – conference committee
SB 2123 DMR Confiscation Authority - enacted
SB 2344 Pore Space - conference committee
PRODUCING WELLS
DRILLING RIGS
PRODUCTION
INNOVATION
PRICE-RIGS-WELLS-JOBS PROJECTION
2019 LEGISLATURE - REGULATORY
DMR RULE CHANGES
Royalty Statement Changes Effective 7/1/2019

Public Hearings August 2019
Effective April 2020
Bonding
Idle Wells
Slurry Injection
Ownership Interest Information Statements
Produced Gas Storage