North Dakota Pipeline Authority
Great Plains & EmPower ND Energy Expo
November 19, 2012 – Bismarck, ND
Natural Gas Study
Commodity Price Disparities Are Shifting Producer Behavior

- Low Natural Gas Prices Are Forcing Producers to Reevaluate Economics and Investment in Conventional and Even Unconventional Lean Gas Assets.

AND

- Higher Relative Oil and NGL Prices Incentivize Producers to Redirect Resources Toward Assets With a Higher BTU Content.

ARE

- Driving Capital into the Williston Basin and Reducing Competition For Space on Existing Infrastructure Moving Gas Out of the Area.

Source: ICE, EIA
Bakken Earns Above Average Returns

Price Assumptions: Gas = 12 month forward average curve for each regional pricing point as of June, 2012 (price range $2.45-$2.86/Mcf)
Oil = 6 month average WTI +/- differential as of June, 2012 (price range $84.40-$100.43/barrel)
NGLs = weighted average $/barrel based on current Mt. Belvieu prices and the typical composition in each region (range $23.79-$45.22/barrel)
Plays With High Returns Attract Drilling Rigs

Source: Rig Data, BENTEK, June 2012

Active rig count: June 15, 2012 / Change in rig count from Jan. 1, 2010
Other counties with active rigs that see reduced activity include: Bowman, Roosevelt, Richland, Golden Valley, Burke.
Bubble Point

- **High Reservoir Pressure**
  - Only Liquid Present
  - Bubble Point Pressure
  - Liquid & Gas Present

- **Low Reservoir Pressure**
Gas – Oil Ratio (GOR) Increasing Over Time

Horizontal Well Completed in Target Reservoir
Gas – Oil Ratio (GOR) Increasing Over Time

Youngest - Original Reservoir Pressure

Oldest – Entire Reservoir Below Bubble Point

High Reservoir Pressure

Bubble Point Pressure

Low Reservoir Pressure
Production curve for the Bakken and Three Forks, US Williston Basin.
Source: BENTEK Energy July 2012 Report
Only horizontal wells shown on map
1980’s-90’s Bakken Development

GOR 1,000 CUFT/BBL

GOR 3,000 CUFT/BBL

GOR 1,000 CUFT/BBL
North Dakota Type Curves*

*Based on the July 2012 BENETEK Natural Gas Study
September 2012 Forecast Assumptions

Drilling Rigs

- North Dakota - 1
- North Dakota - 2
- Montana
September 2012 Forecast Assumptions

**Completed Wells**

- **North Dakota - 1**
- **North Dakota - 2**
- **Montana - 1**
Forecasting Williston Basin Oil Production, BOPD

Production forecast is for visual demonstration purposes only and should not be considered accurate for any near or long term planning.
Williston Basin Gas Production

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North Dakota NGL Potential

Assumptions

- No Flaring
- 8 Gal/MCF
- All liquids extracted
Oil Transportation
Challenges*
1) Moving oil out of the Williston Basin
2) Moving oil within the Williston Basin

*Modified from Bridger and Belle Fourche Pipelines
BNSF Crude Rail Locations

⭐ Existing
1) Dore – Musket - Unit
2) Trenton – Savage – Manifest/Unit
3) Williston – Red River Supply - Manifest
4) Tioga – Hess - Unit
5) Manitou – Plains - Unit
6) Ross – Bakken Transload - Manifest
7) Stanley – EOG - Unit
8) Minot – ND Port Services- Manifest
9) Zap/Republic – Basin Transload - Unit
10) Eland – BOE - Unit
11) Dickinson – Centennial - Manifest
12) Gascoyne – Enserco – Manifest/Unit
13) Epping – Rangeland – Unit
14) Berthold – Enbridge – Unit (Full Serv Q1/13)

⭐ Planned
1) Fryburg – Great Northern - Unit
CP Crude Rail Locations

1) Stampede – US Development
2) Donnybrook - Centennial
3) New Town – Dakota Plains
4) Van Hook– US Development
Estimated ND Rail Export Volumes

Through September 2012
Source: Jodi Quinnell, BENTEK Energy - Sept 12, 2012 “Crude Awakening”
Williston Basin Oil Production & Export Capacity, BOPD

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Natural Gas Study
Transmission Future
Open Capacity Leaving N. Dakota Is Tight

- Northern Border and Alliance Serve As the Primary Routes to Transport Gas From the Region.
- Each Have Limited Open Mainline Capacity to Carry Additional Williston Supply.
ND Natural Gas Pipelines
ND Gas Plant Capacity

Six New/Expanded Plants in Next 12-24 months
First Time Gas Sales Per Month
ND Gas Gathering Statistics

- Wells With Gas Sales or Lease Use
- Wells Without Gas Sales
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