Understanding production potential

Understanding current transportation dynamics and potential transportation constraints

Understanding current and future market conditions
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Understanding current and future market conditions
Production forecast is for visual demonstration purposes only and should not be considered accurate for any near or long term planning.

JJ Kringstad - North Dakota Pipeline Authority
Crude Oil

Understanding production potential

Understanding current transportation dynamics and potential transportation constraints

Understanding current and future market conditions
North Dakota Crude Oil Pipelines

Challenges*
1) Moving oil out of the Williston Basin
2) Moving oil within the Williston Basin

*Modified from Bridger and Belle Fourche Pipelines
North Dakota Crude Oil Pipelines

145,000 BOPD

210,000 BOPD

68,000 BOPD

160,000 BOPD
Oil Loading Rail Facilities
Estimated Williston Basin Oil Transportation

- 72% Estimated Pipeline Export
- 21% Truck to Canadian Pipelines
- 6% Tesoro Refinery
- 1% Estimated Rail

January 2014
Estimated Williston Basin Oil Transportation

- Estimated Rail
- Estimated Pipeline Export
- Tesoro Refinery
- Truck to Canadian Pipelines
- Brent - WTI Spread (EIA)

 JJ Kringstad - North Dakota Pipeline Authority
Estimated ND Rail Export Volumes

Barrels Per Day

May-08, Sep-08, Jan-09, May-09, Sep-09, Jan-10, May-10, Sep-10, Jan-11, May-11, Sep-11, Jan-12, May-12, Sep-12, Jan-13, May-13, Sep-13, Jan-14
Crude Oil Gathering
Challenges*
1) Moving oil out of the Williston Basin
2) Moving oil within the Williston Basin

*Modified from Bridger and Belle Fourche Pipelines
ND Crude Oil Gathering

**Red** – Trucked
**Blue** – Pipeline

64% Red
36% Blue

All ND Production

Sep 2012 Estimates – Some data incomplete or unavailable
ND Oil Gathering

Red – Trucked
Blue – Pipeline

All ND Production

Sep 2013 Estimates
Some data incomplete or unavailable

Oil Gathering
- %Piped (Sum)
- %Trucked (Sum)

Oil Production

Produced (Sum)

3.738.00
8,350,326.00
ND Oil Gathering

Red – Trucked
Blue – Pipeline

All ND Production

Sep 2013 Estimates
Some data incomplete or unavailable

Oil Gathering

- %Piped (Sum)
- %Trucked (Sum)

Oil Production

Produced (Sum)

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3.738.00
8.350.326.00

JJ Kringstad - North Dakota Pipeline Authority
Year-Over-Year Oil Gathering Changes*

*Best available estimate. Some data incomplete or missing

~250 Additional Truckloads Per Day

Barrels per Day

Sep-12
Trucked Volume
Piped Volume

Sep-13
Estimated YOY Daily Truckload Change

Sep 2012 to Sep 2013
Assumes - 225 bbls/truck
Closer Look at Gathering Type

Gathering (After CTB)
Green = Pipeline
Red = Truck
Yellow = Both
Blue = Confidential
Sep 2013 Data
Closer Look at Gathering Type

Gathering (After CTB)
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Crude Oil

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US Refining Infrastructure

EIA Dec 2013 Refinery Acquisition Cost

PADD IV
$84.53

PADD III
$95.99

PADD V
$78.98

PADD II
$100.76

PADD I
$106.38

JJ Kringstad - North Dakota Pipeline Authority
Major Rail Lines and Refineries

EIA Dec 2013 Refinery Acquisition Cost

PADD IV

$100.76

PADD V

$78.98

PADD II

$84.53

PADD III

$95.99

PADD I

$106.38

 JJ Kringstad - North Dakota Pipeline Authority
Williston Basin Oil Production & Export Capacity, BOPD

Production forecast is for visual demonstration purposes only and should not be considered accurate for any near or long term planning.
Solving the Flaring Challenge

Statewide

- **GREEN** – % of gas captured and sold
- **Blue** – % flared from zero sales wells
- **Orange** – % flared from wells with at least one mcf sold.

**Simple Terms**

- **Blue** – Lack of pipelines
- **Orange** – Challenges on existing infrastructure

January 2014 Data – Non-Confidential Wells

*Hess Tioga Gas Plant shut-in for 140 MMCFD expansion starting in November
Capturing the 18% Faster Well Connections

- New Wells Selling Gas
- New Producing Wells

*Weather Related & Gas Plant Shutdown
ND Gas Gathering Statistics

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

Weather Related & Gas Plant Shutdown
North Dakota Natural Gas Production Forecast

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

North Dakota Natural Gas, MMCFD

JJ Kringstad - North Dakota Pipeline Authority
ND Gas Transmission and Processing
Rich Natural Gas

Raw Natural Gas (1500+ BTU) → Processing Plant → Consumer Quality Dry Natural Gas

Methane

Ethane 41.64%

Propane 28.33%

Butane 16.53%

Natural Gasoline 13.51%

NGL’S (8-12 gpm) Y-Grade or Fractionated

*Using NGL breakdown from the July 2012 BENTEK Natural Gas Study*
ND Gas Plant NGL Production

Barrels Per Day

- Other (Ethane/Y-Grade)
- Natural Gasoline
- Butane
- Propane

Dates:
- 11/1/2005
- 4/1/2006
- 9/1/2006
- 2/1/2007
- 7/1/2007
- 12/1/2007
- 5/1/2008
- 10/1/2008
- 3/1/2009
- 8/1/2009
- 1/1/2010
- 6/1/2010
- 11/1/2010
- 4/1/2011
- 9/1/2011
- 2/1/2012
- 7/1/2012
- 12/1/2012
- 5/1/2013

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North Dakota NGL Potential

Assumptions

- No Flaring
- 8 Gal/MCF
- All liquids extracted
Case 1: ND NGL Potential*

*Using NGL breakdown from the July 2012 BENTEK Natural Gas Study

Barrels Per Day

- Nat Gasoline: 13.51%
- Isobutane: 9.55%
- Butane: 6.98%
- Propane: 28.33%
- Ethane: 41.64%

*Using NGL breakdown from the July 2012 BENTEK Natural Gas Study
Moving Future NGL Volumes

Transportation Options

- Trucking Regionally
- Rail Transportation
- Vantage Pipeline (Ethane)
- ONEOK Bakken Pipeline (Y-Grade)
- Alliance Pipeline (Rich Gas)
- New Pipeline Infrastructure??
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