



North Dakota Pipeline Authority

Oil & Gas Research Council

January 3, 2013

Crude Oil

Understanding production potential

Understanding current transportation dynamics and potential transportation constraints

Understanding current and future market conditions

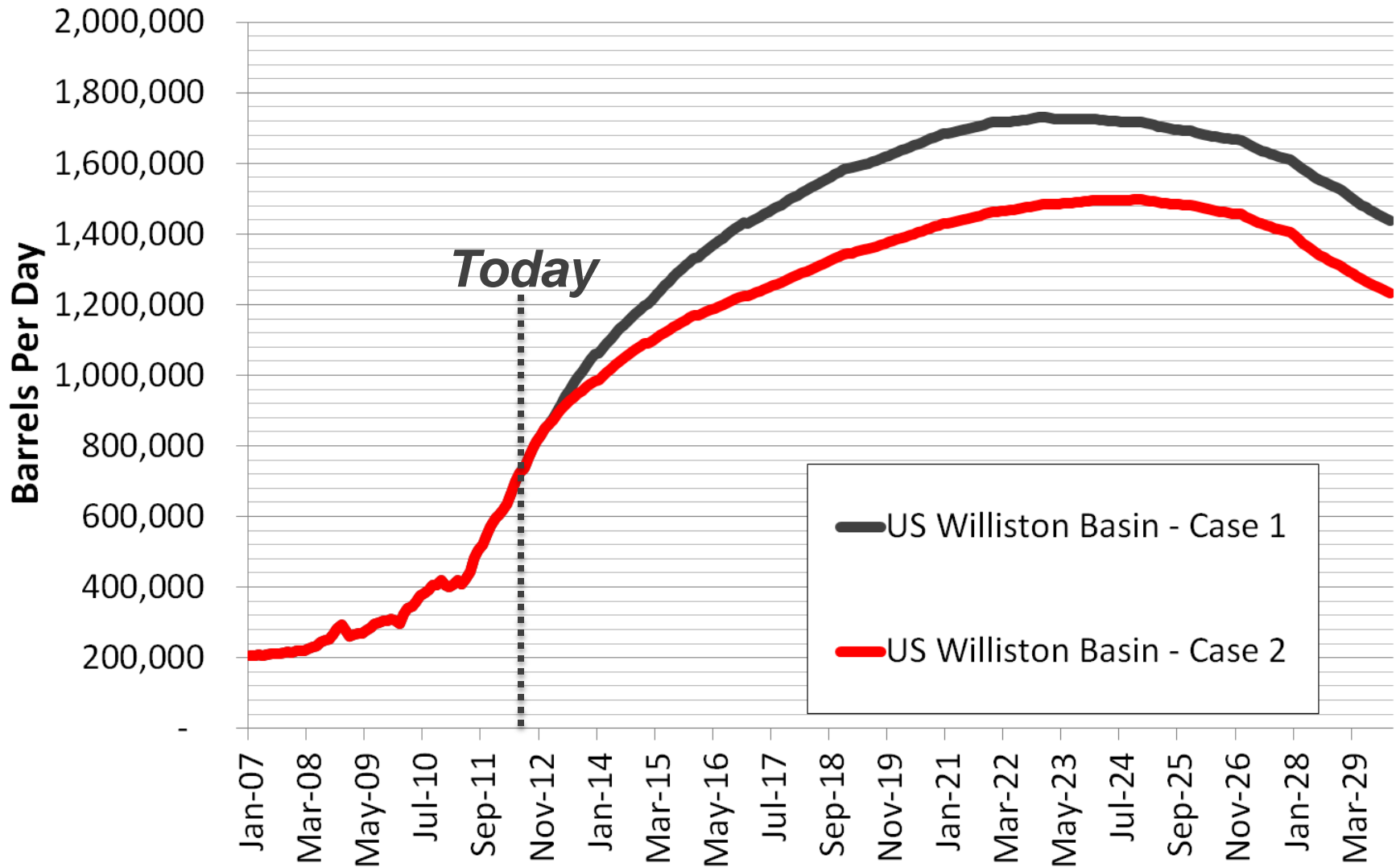
Crude Oil

Understanding production potential

Understanding current transportation dynamics and potential transportation constraints

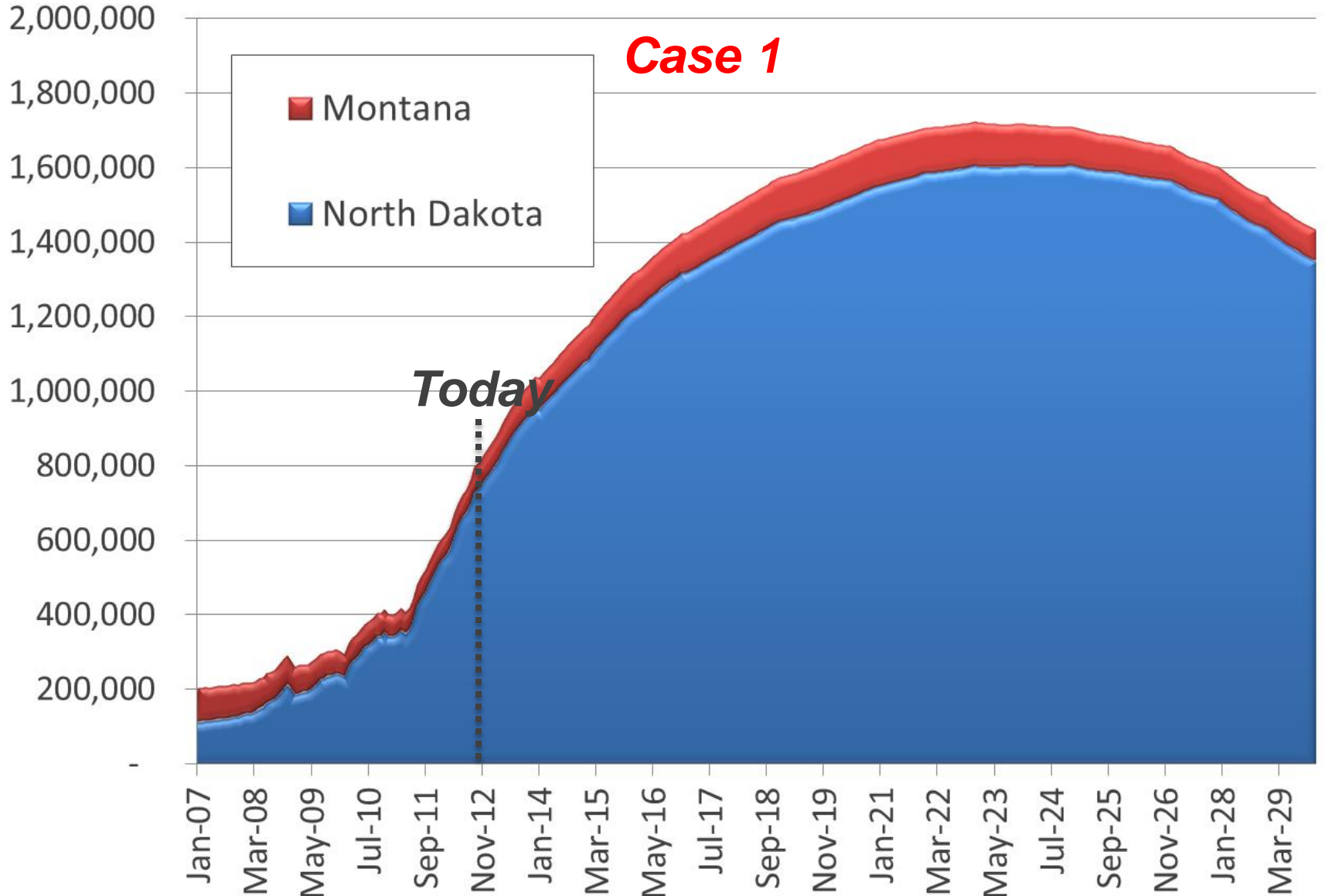
Understanding current and future market conditions

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.

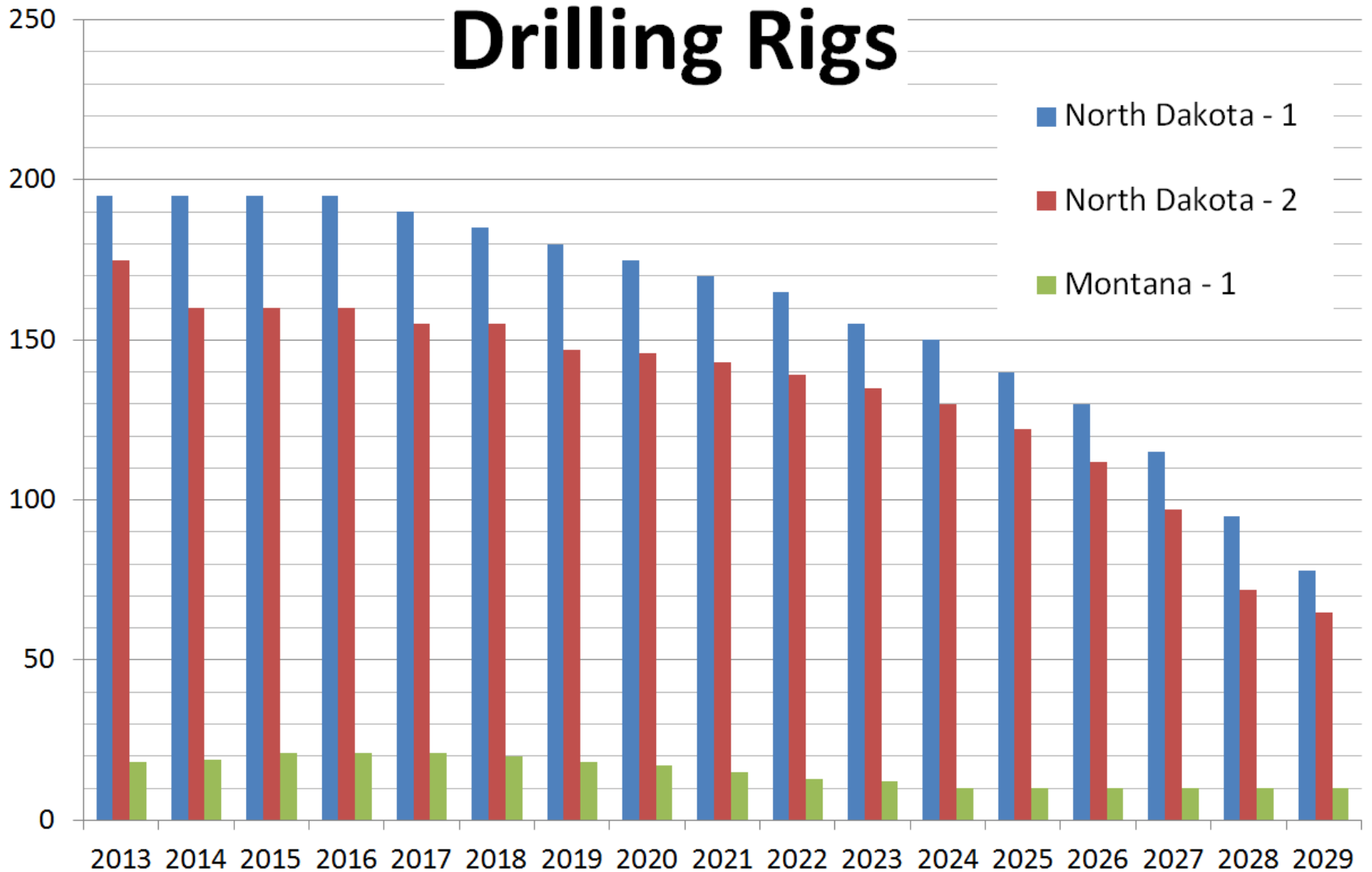
Forecasting Williston Basin Oil Production, BOPD



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

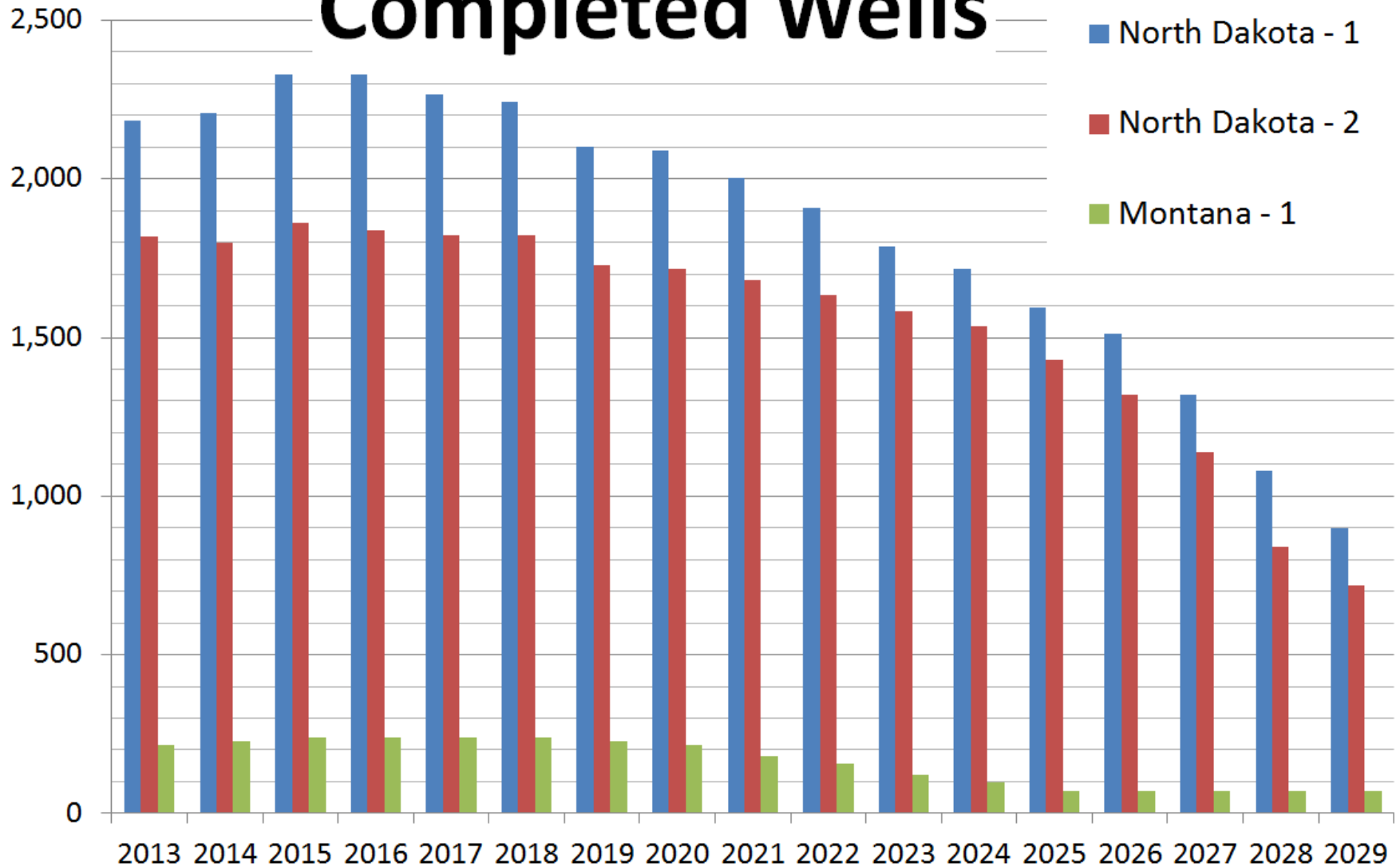
Forecast Assumptions

Drilling Rigs



Forecast Assumptions

Completed Wells



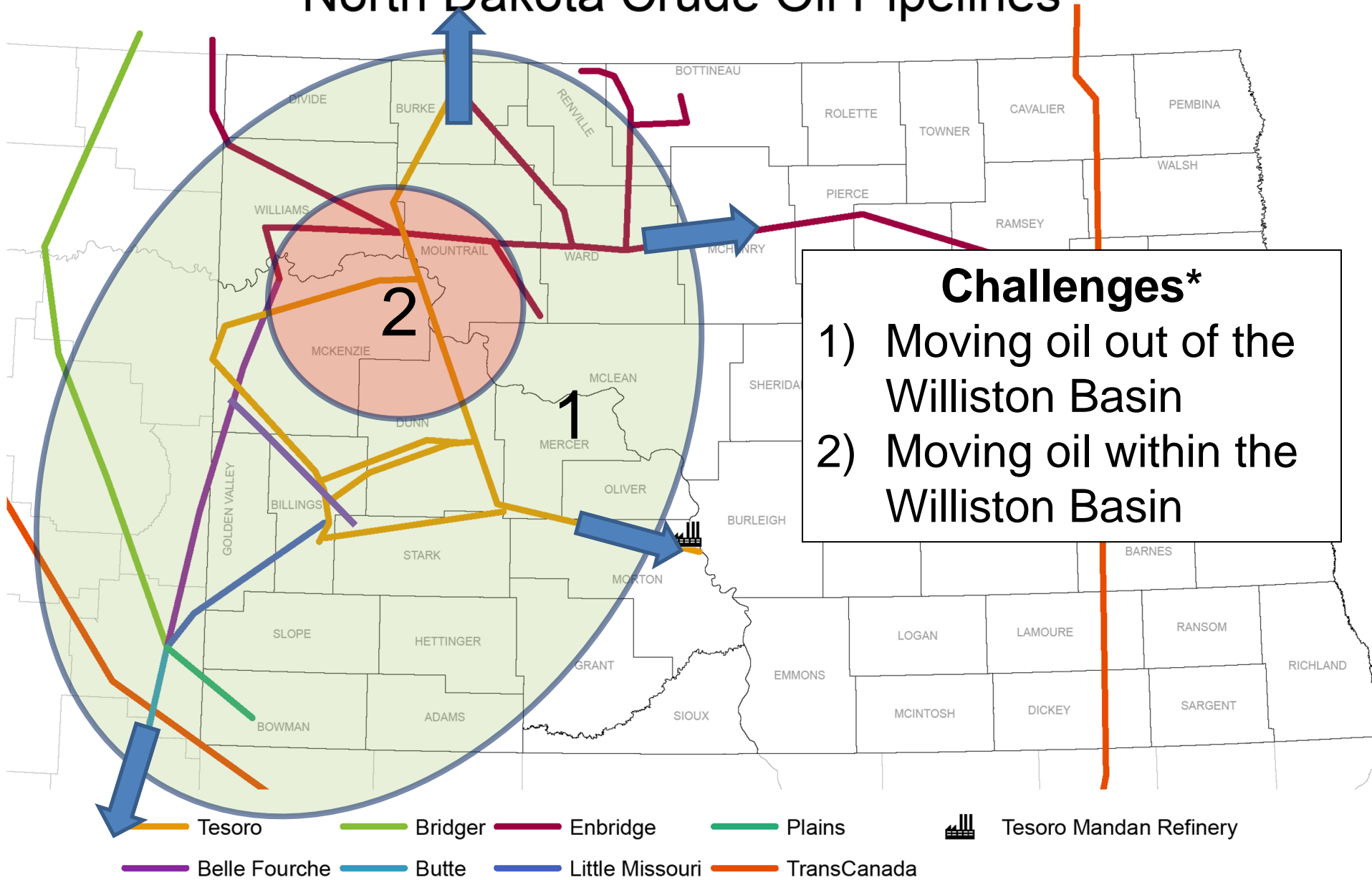
Crude Oil

Understanding production potential

Understanding current transportation dynamics and potential transportation constraints

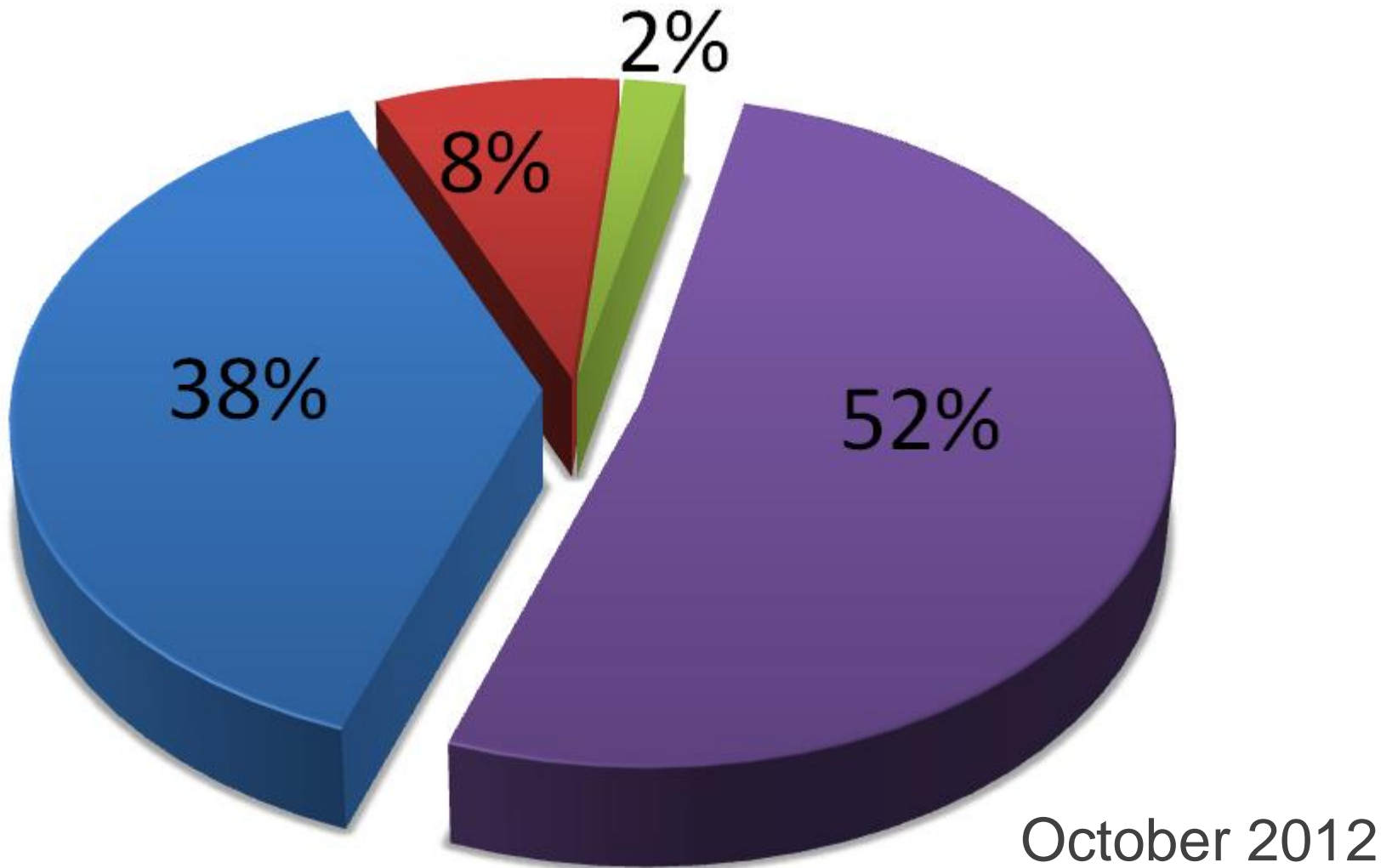
Understanding current and future market conditions

North Dakota Crude Oil Pipelines



*Modified from Bridger and Belle Fourche Pipelines

Williston Basin Oil Transportation



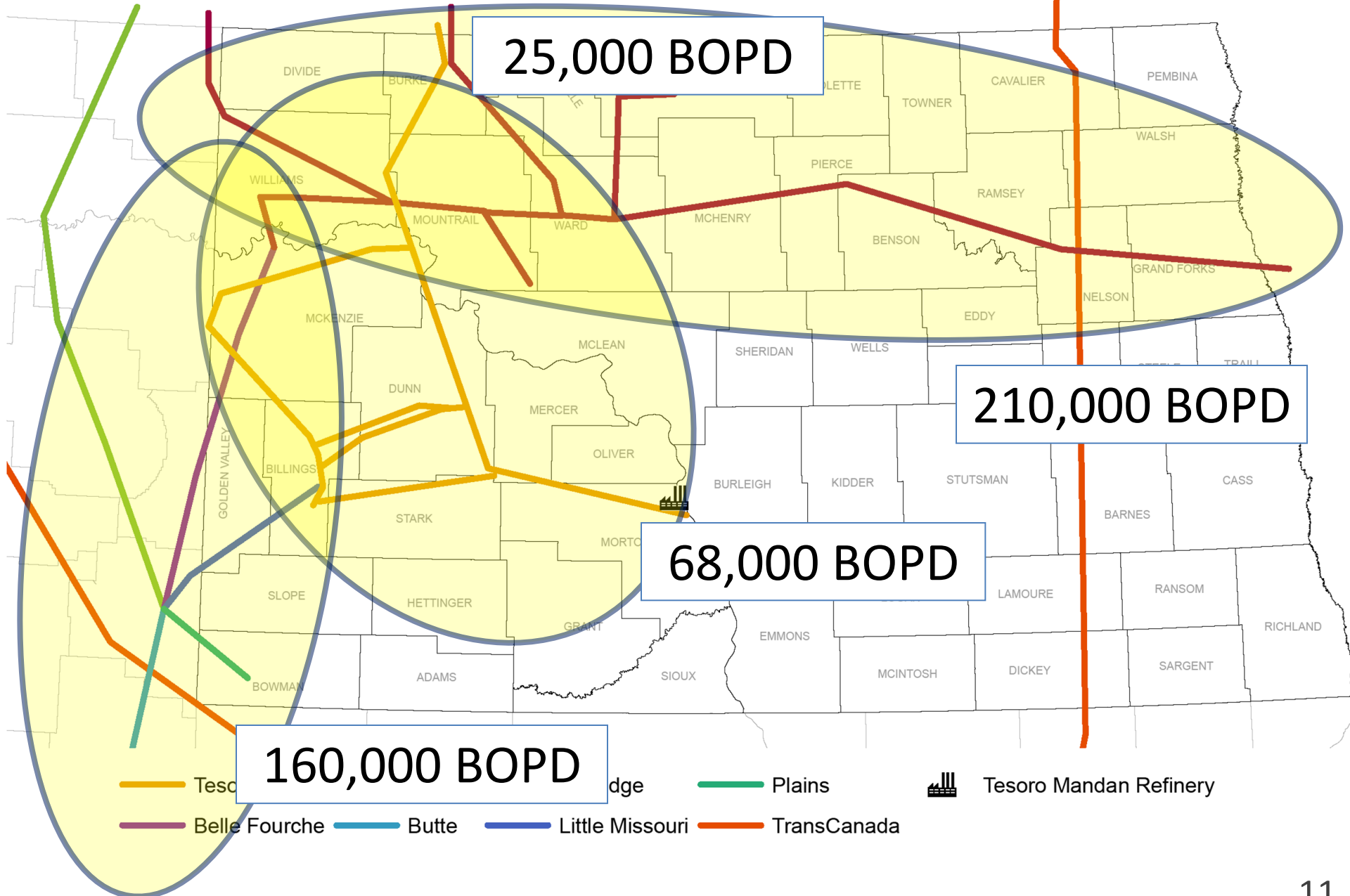
■ Pipeline Export

■ Tesoro Refinery

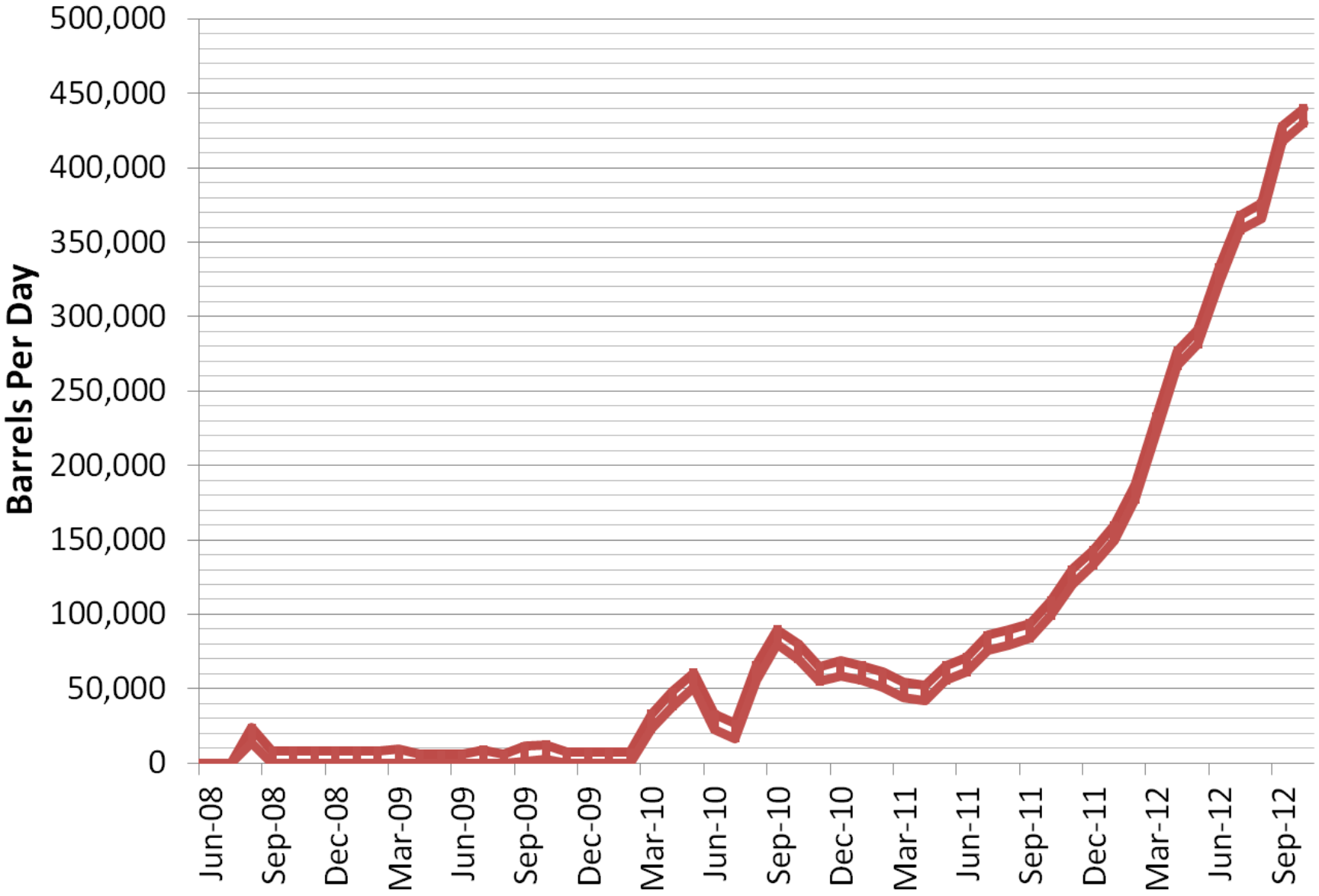
■ Truck to Canadian Pipelines

■ Estimated Rail

North Dakota Crude Oil Pipelines

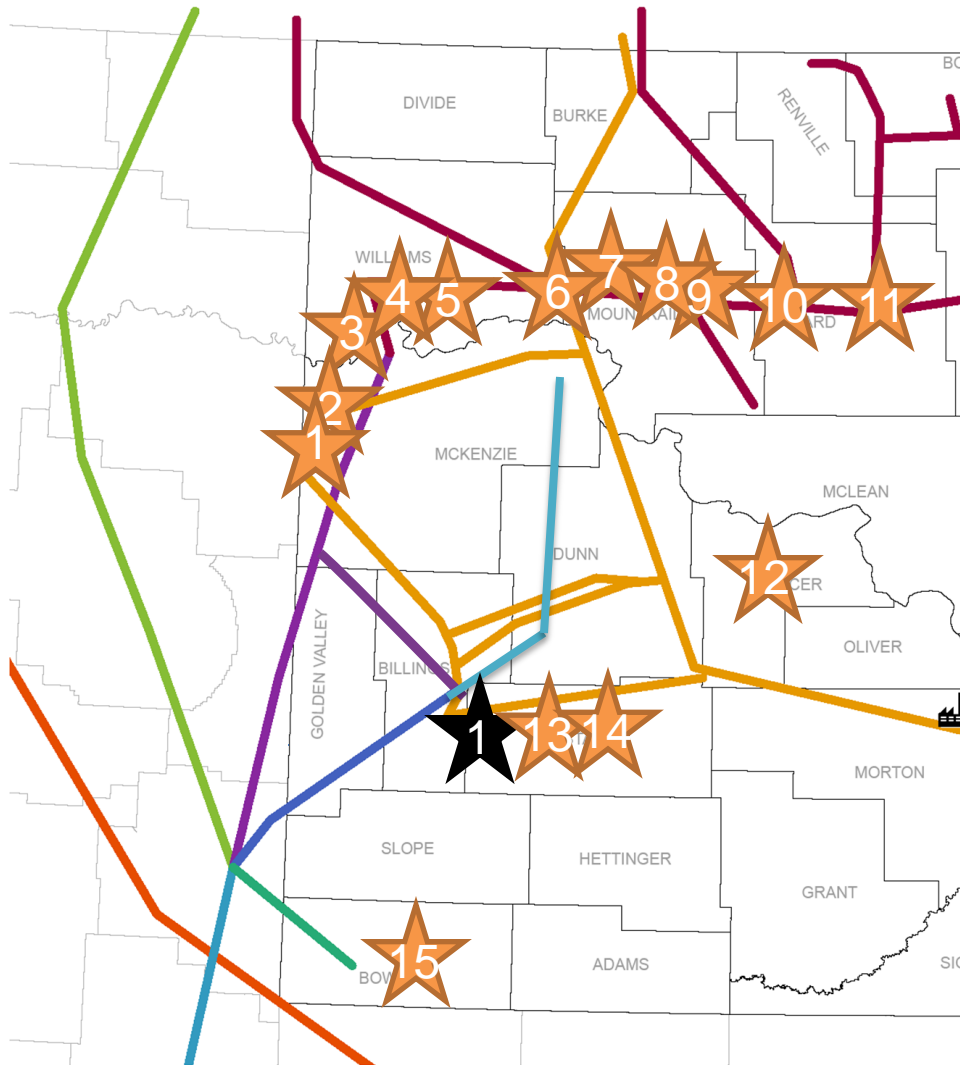


Estimated ND Rail Export Volumes



Through October 2012

BNSF Crude Rail Locations



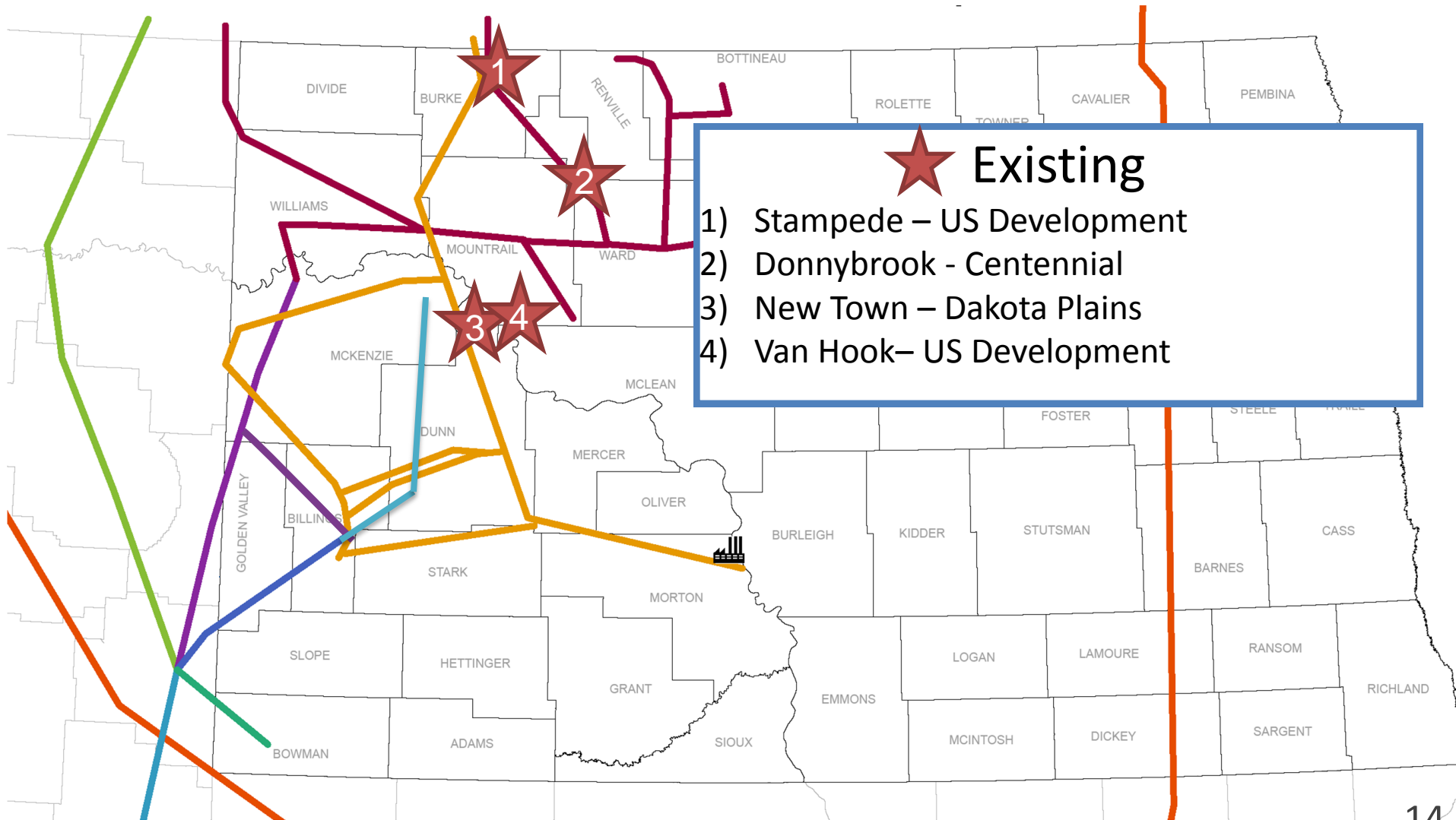
★ Existing

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

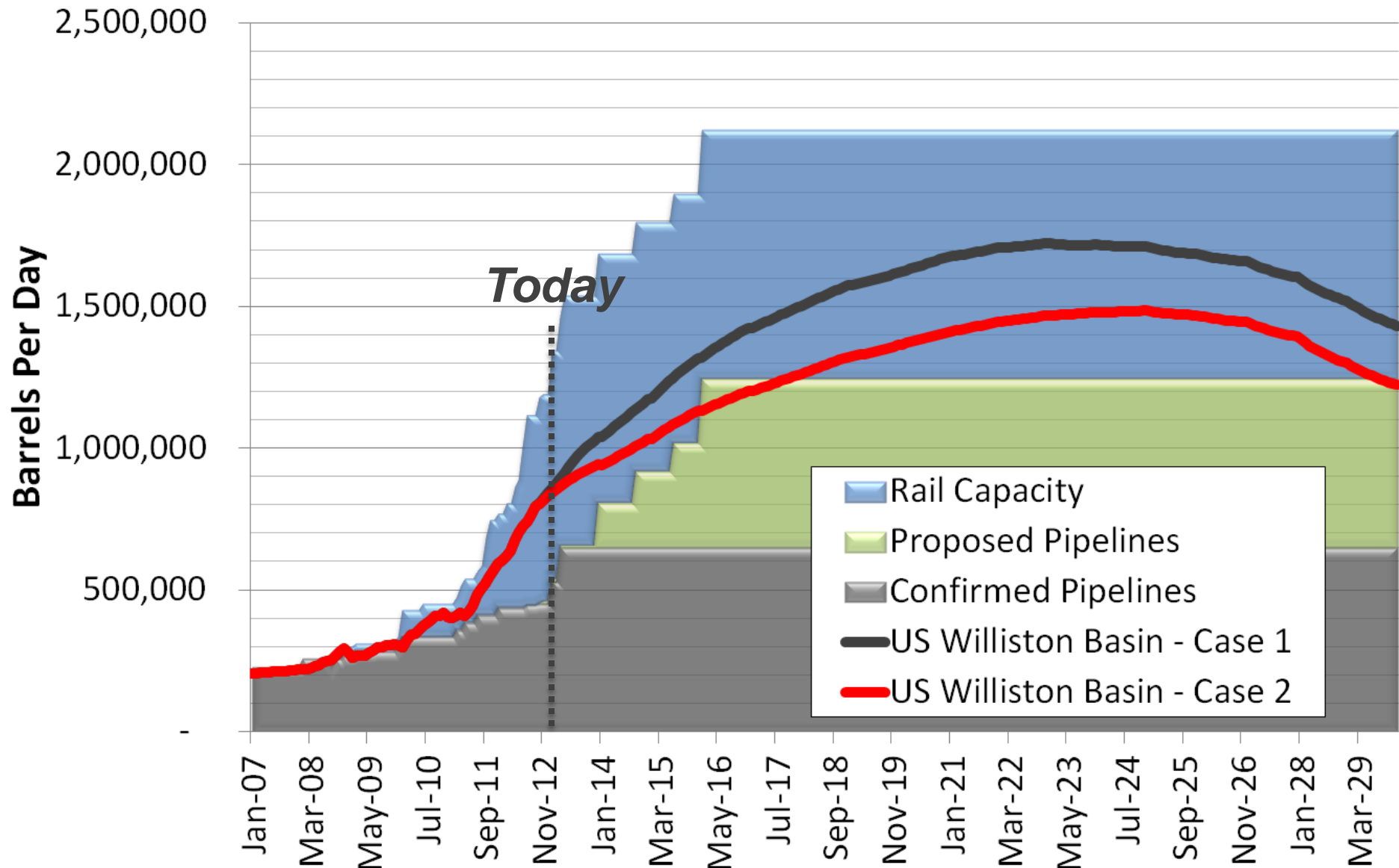
★ Planned

- 1) Fryburg – Great Northern - Unit

CP Crude Rail Locations

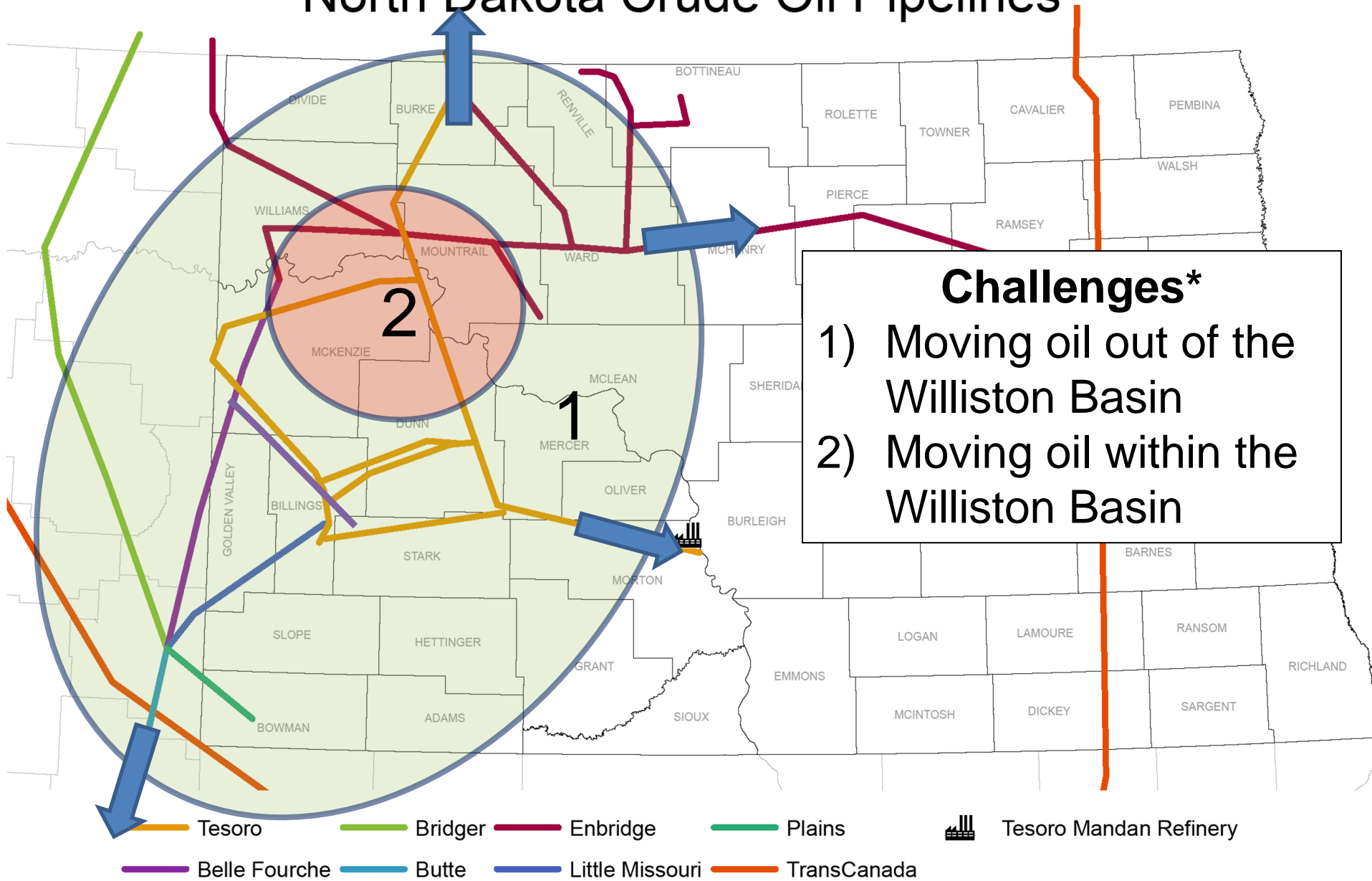


Williston Basin Oil Production & Export Capacity, BOPD



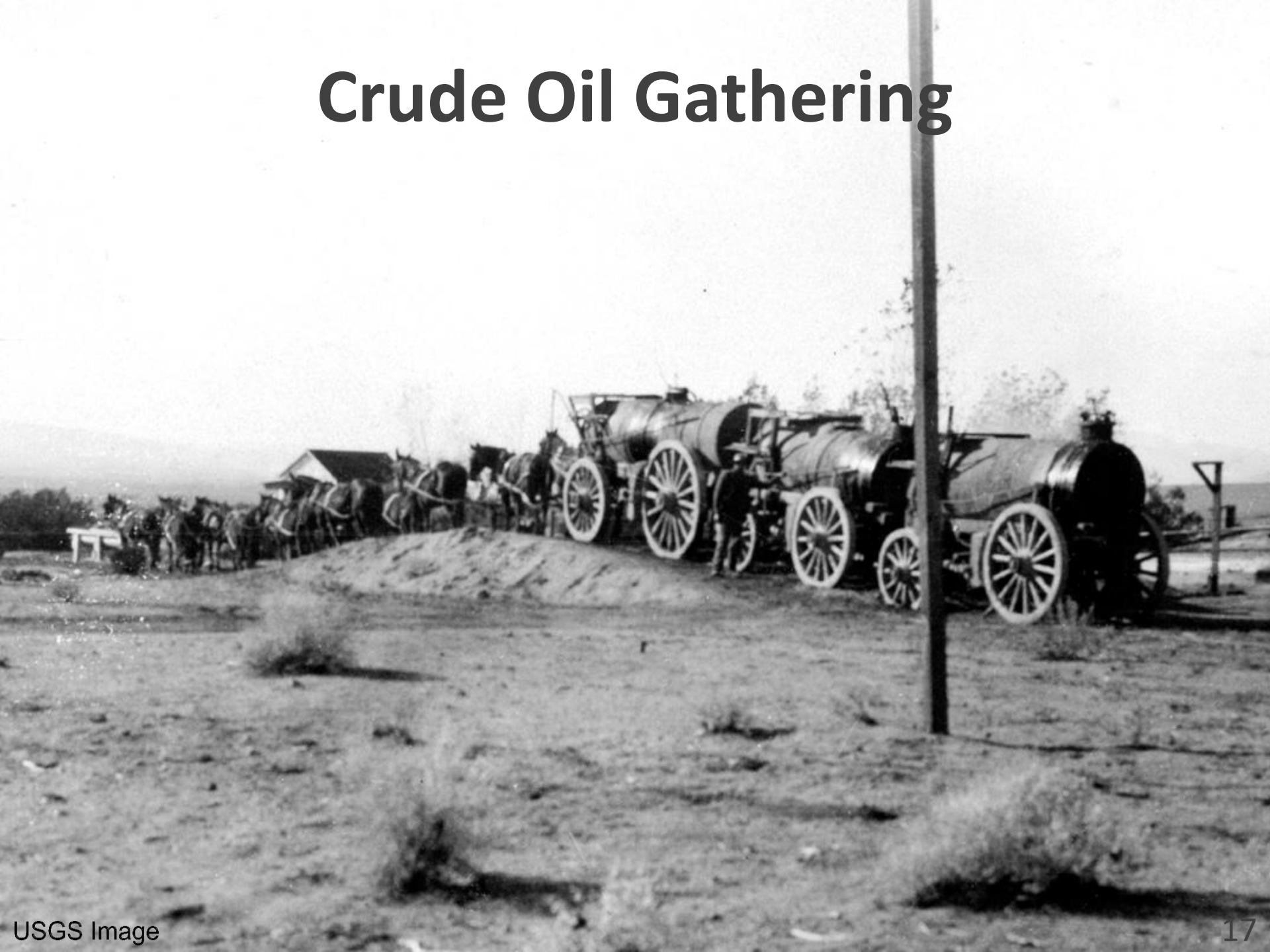
Production forecast is for visual demonstration purposes only and should not be considered accurate for any near or long term planning.

North Dakota Crude Oil Pipelines

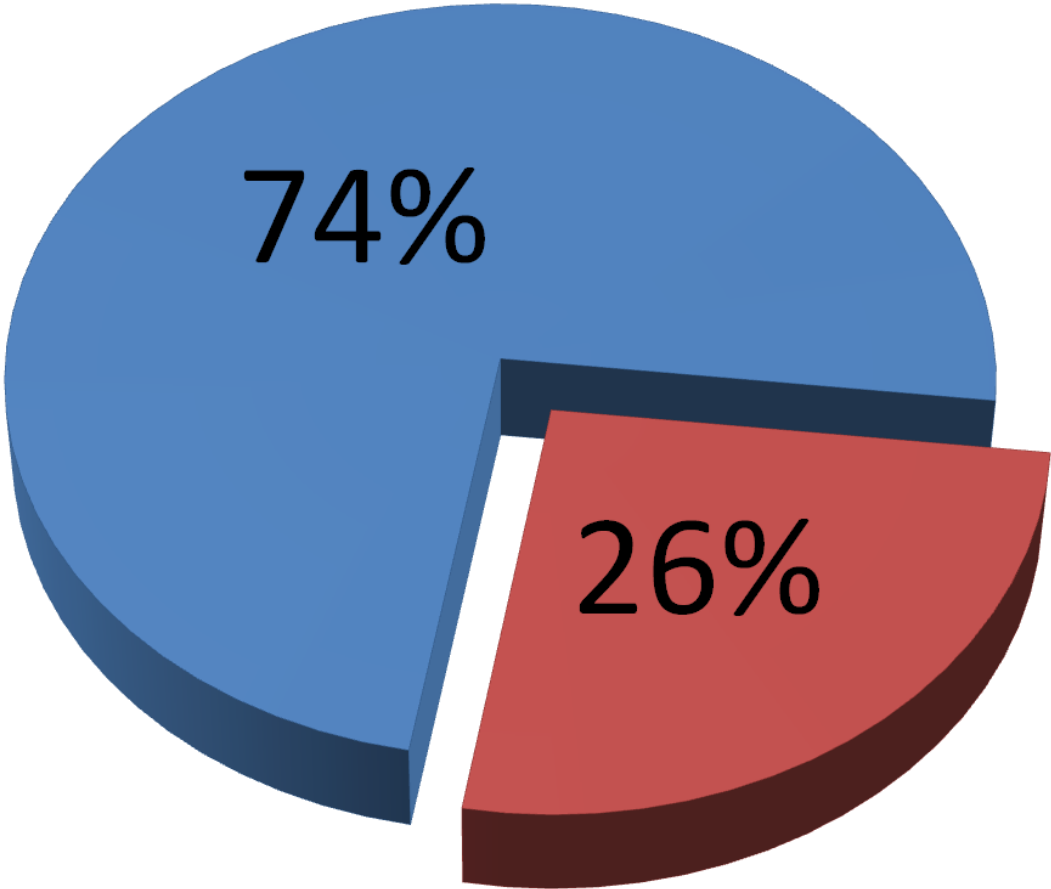


*Modified from Bridger and Belle Fourche Pipelines

Crude Oil Gathering

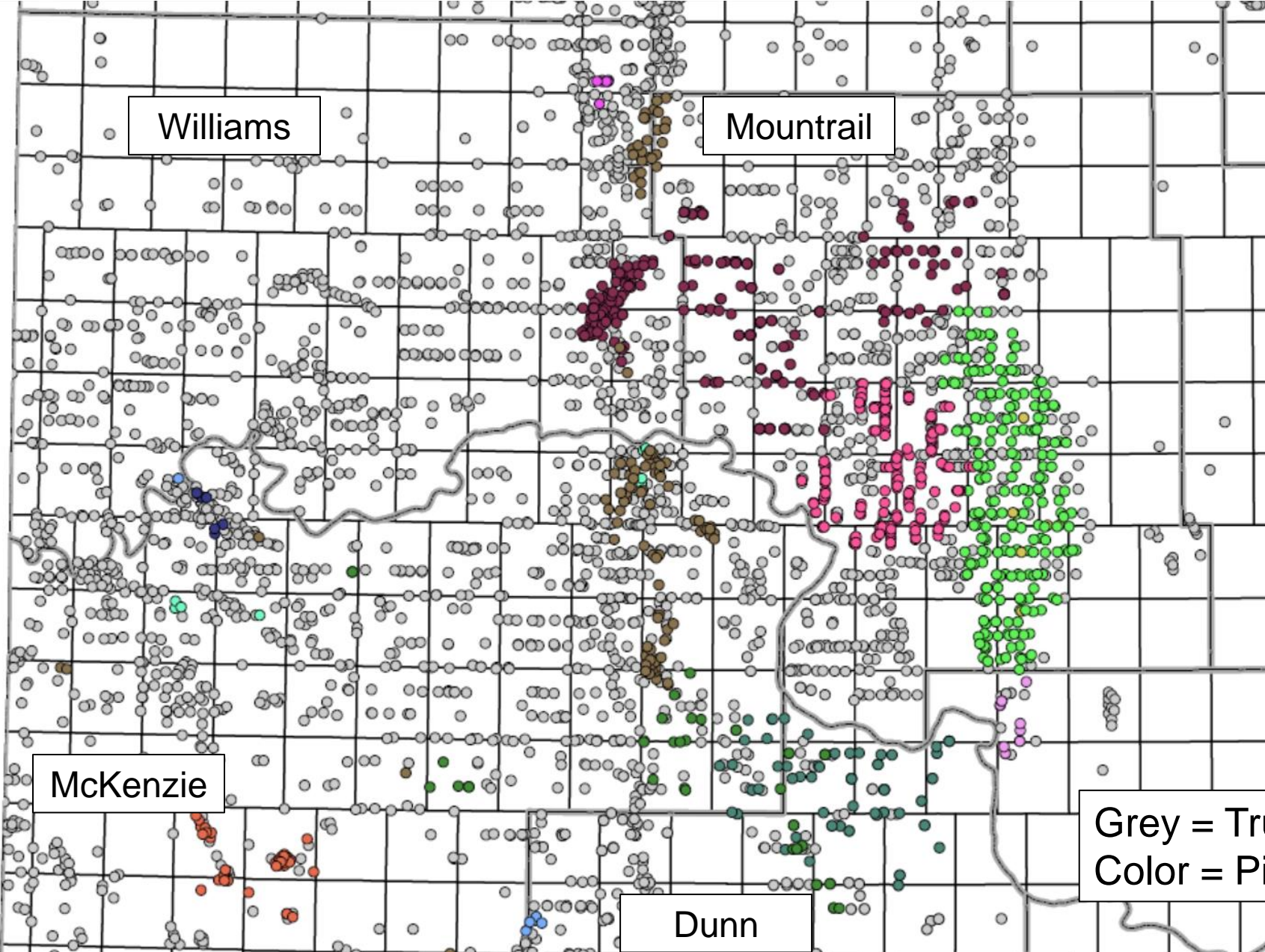


North Dakota Crude Gathering

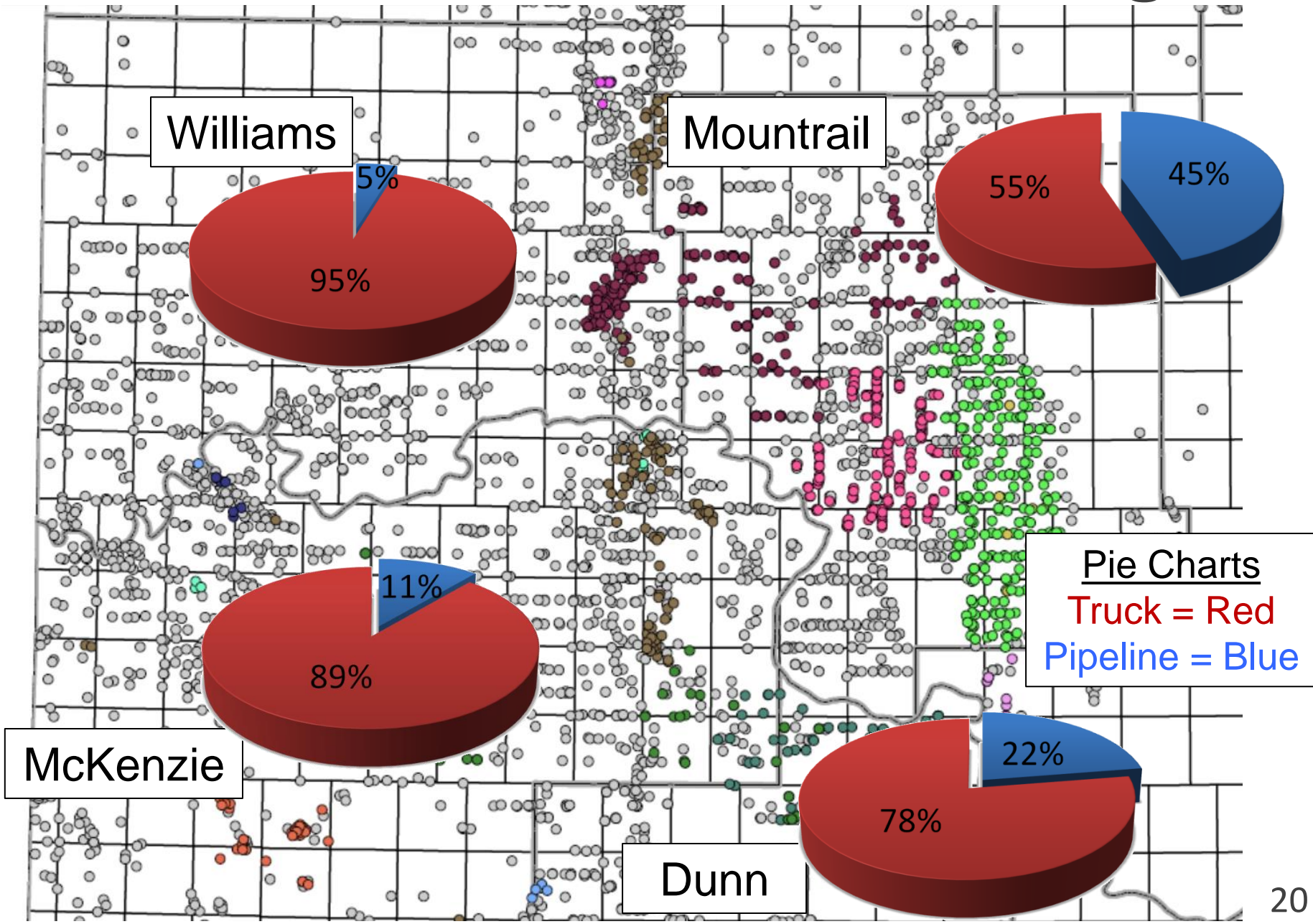


■ Truck ■ Pipeline

North Dakota Crude Gathering



North Dakota Crude Gathering



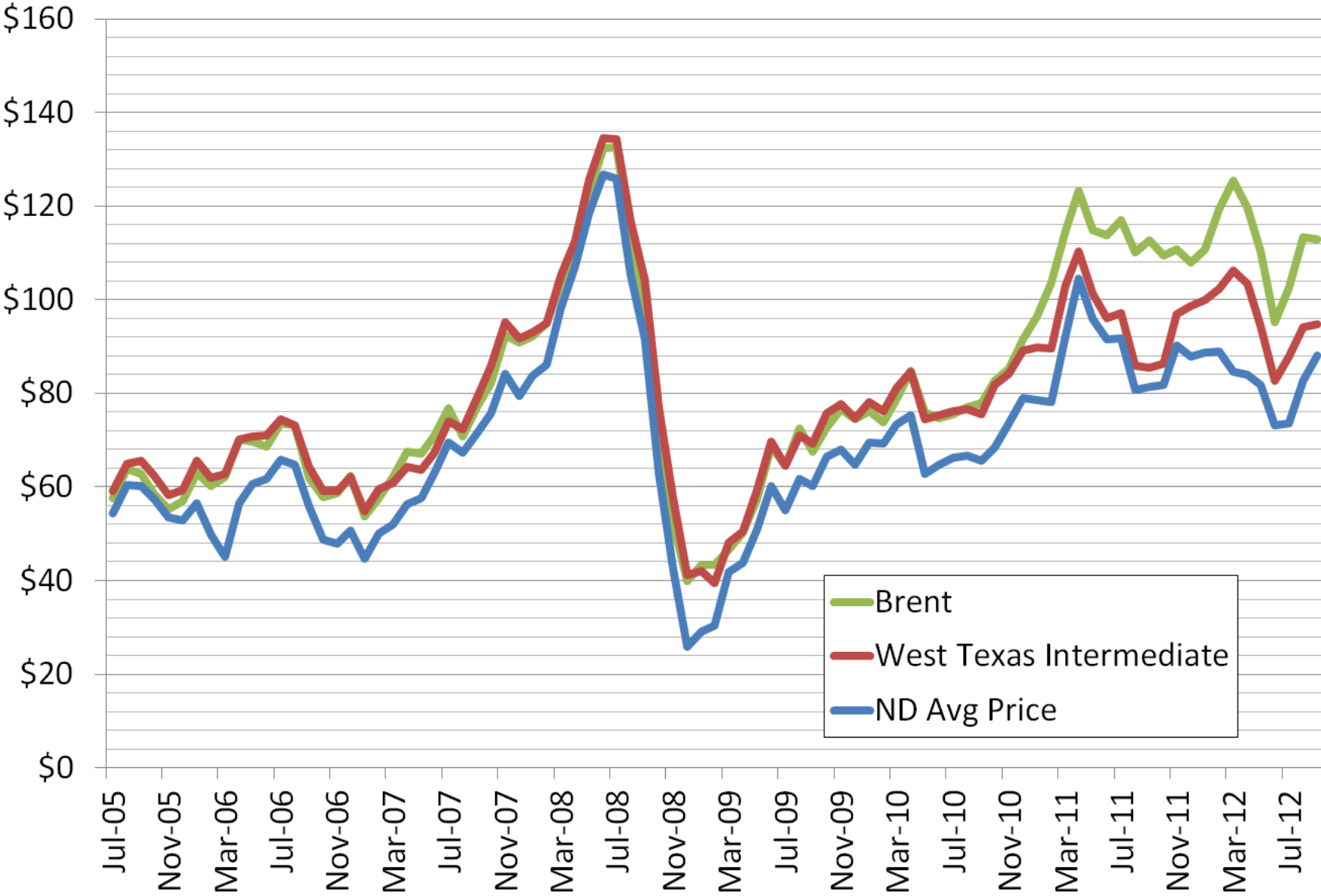
Crude Oil

Understanding production potential

Understanding current transportation dynamics and potential transportation constraints

Understanding current and future market conditions

Crude Oil Prices

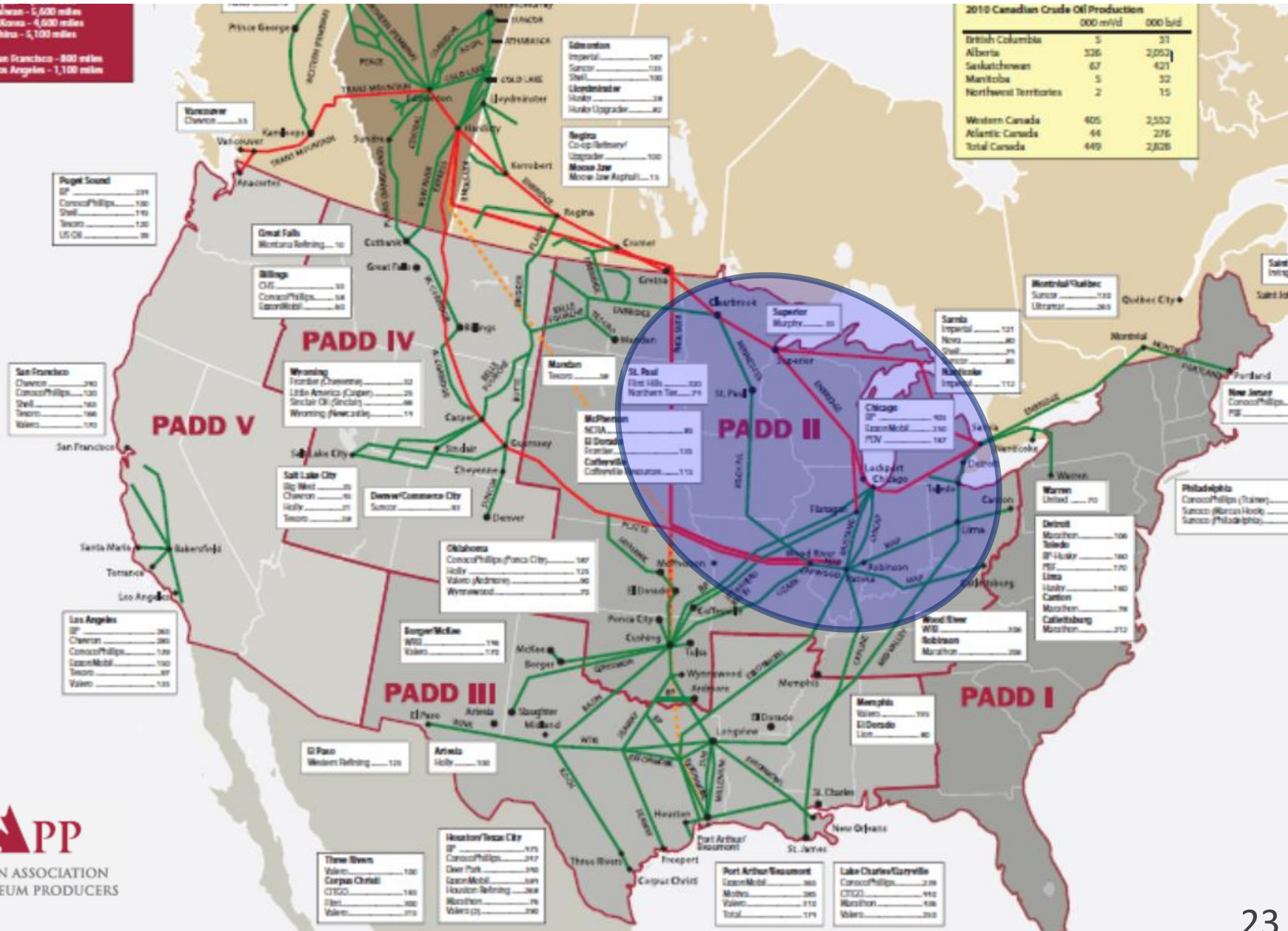


Pipeline Challenges Outside ND

Talwan - 5,600 miles
 S. Korea - 4,600 miles
 China - 5,100 miles

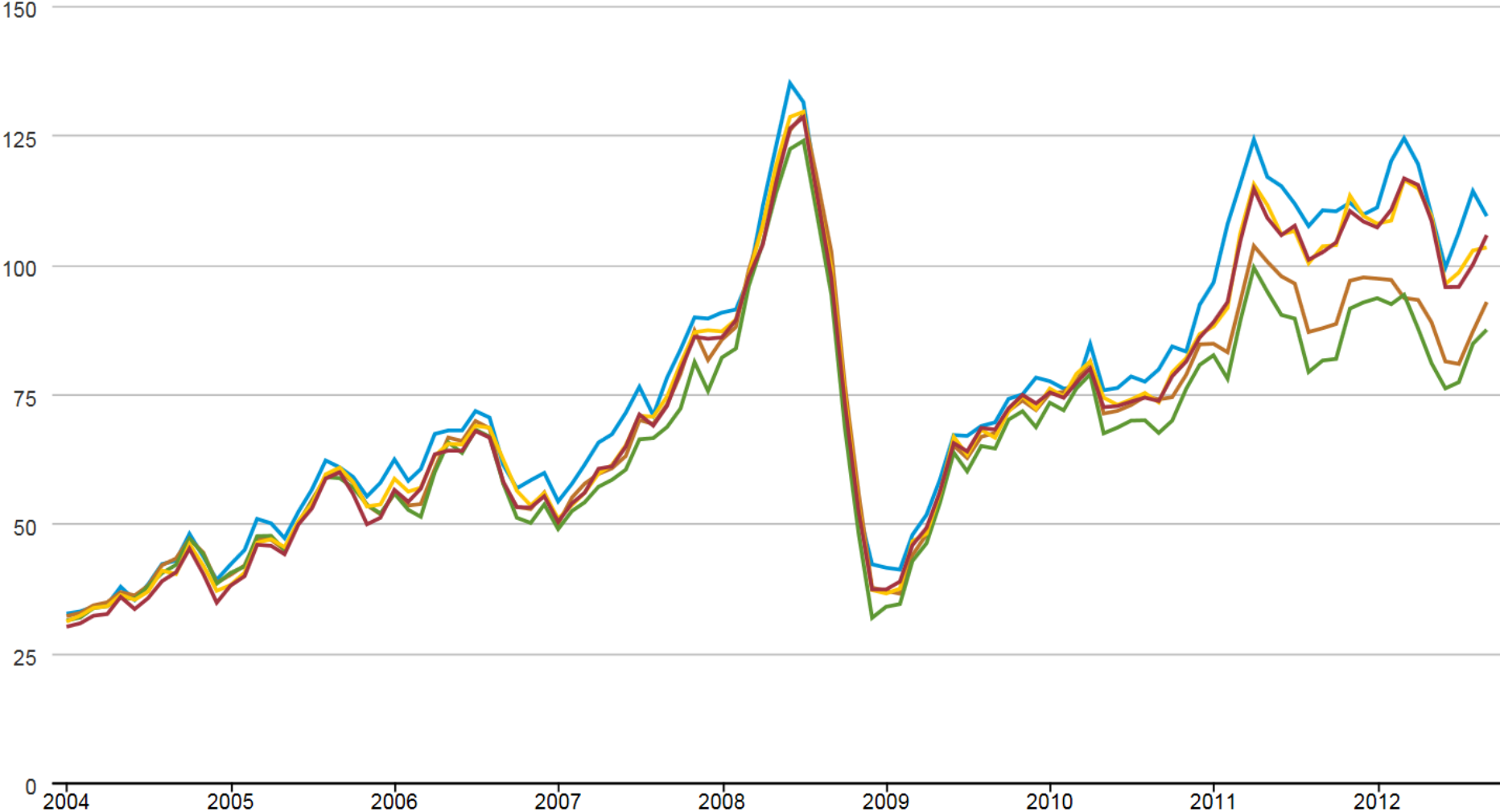
San Francisco - 800 miles
 Los Angeles - 1,100 miles

2010 Canadian Crude Oil Production		
	000 m/b/d	000 b/d
British Columbia	5	31
Alberta	326	2,052
Saskatchewan	67	421
Manitoba	5	32
Northwest Territories	2	15
Western Canada	405	2,552
Atlantic Canada	44	276
Total Canada	449	2,828



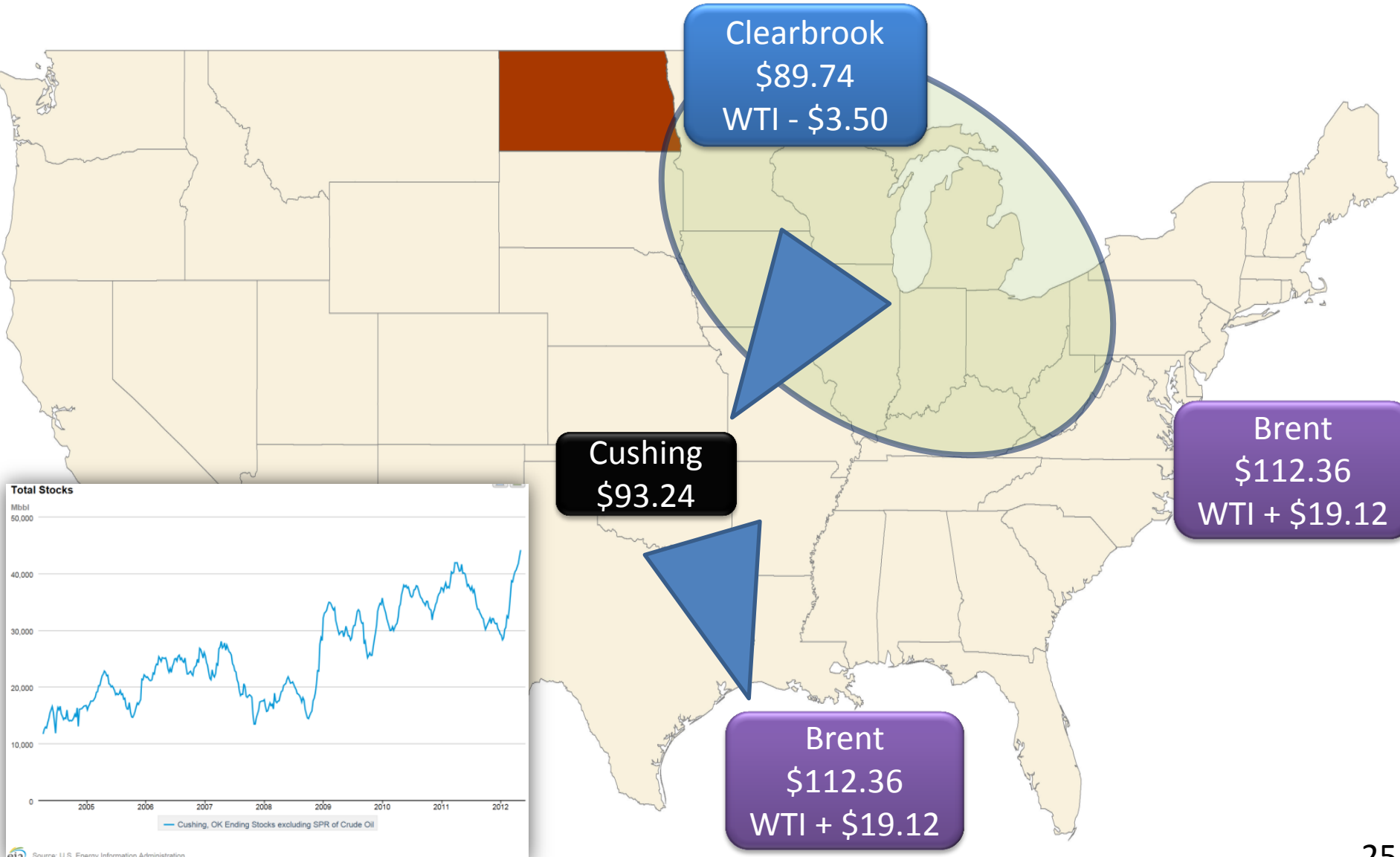
Refiner Acquisition Cost of Crude Oil

\$/bbl

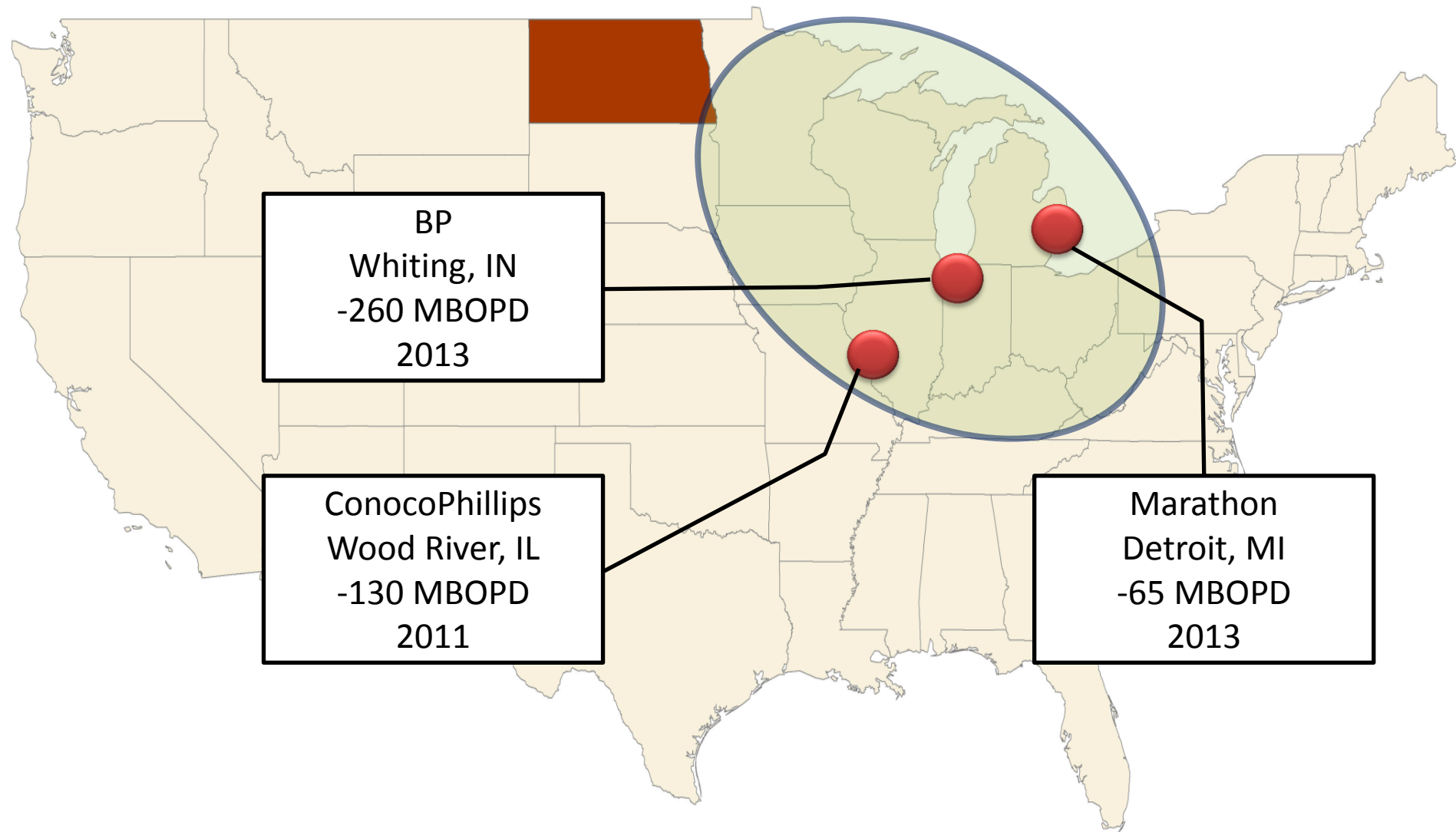


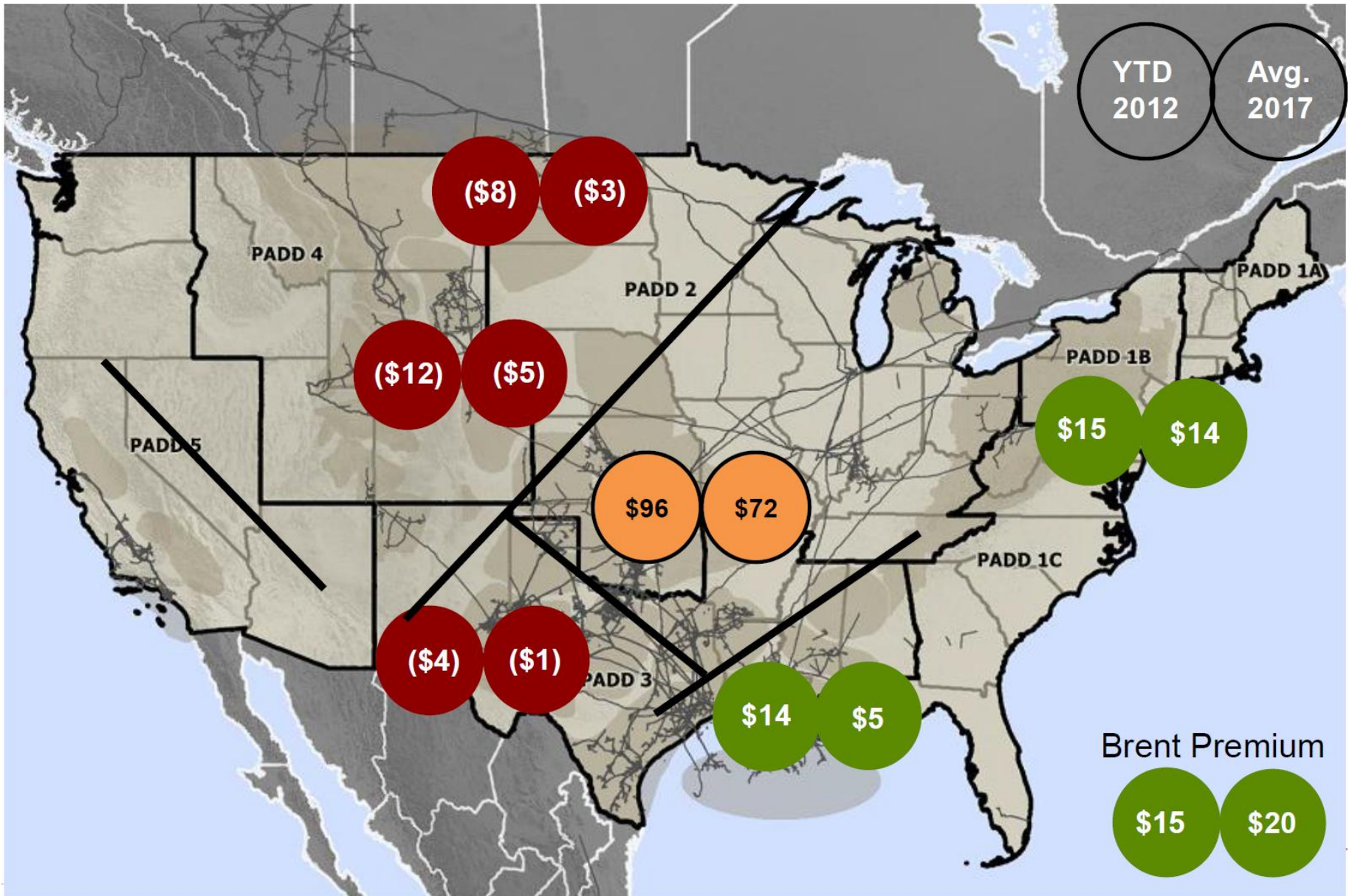
- East Coast (PADD 1) Crude Oil Composite Acquisition Cost by Refiners
- Midwest (PADD 2) Crude Oil Composite Acquisition Cost by Refiners
- Rocky Mountain (PADD 4) Crude Oil Composite Acquisition Cost by Refiners
- West Coast (PADD 5) Crude Oil Composite Acquisition Cost by Refiners
- Gulf Coast (PADD 3) Crude Oil Composite Acquisition Cost by Refiners

Crude Oil Prices – January 2, 2013



PADD II Decrease in Light Demand





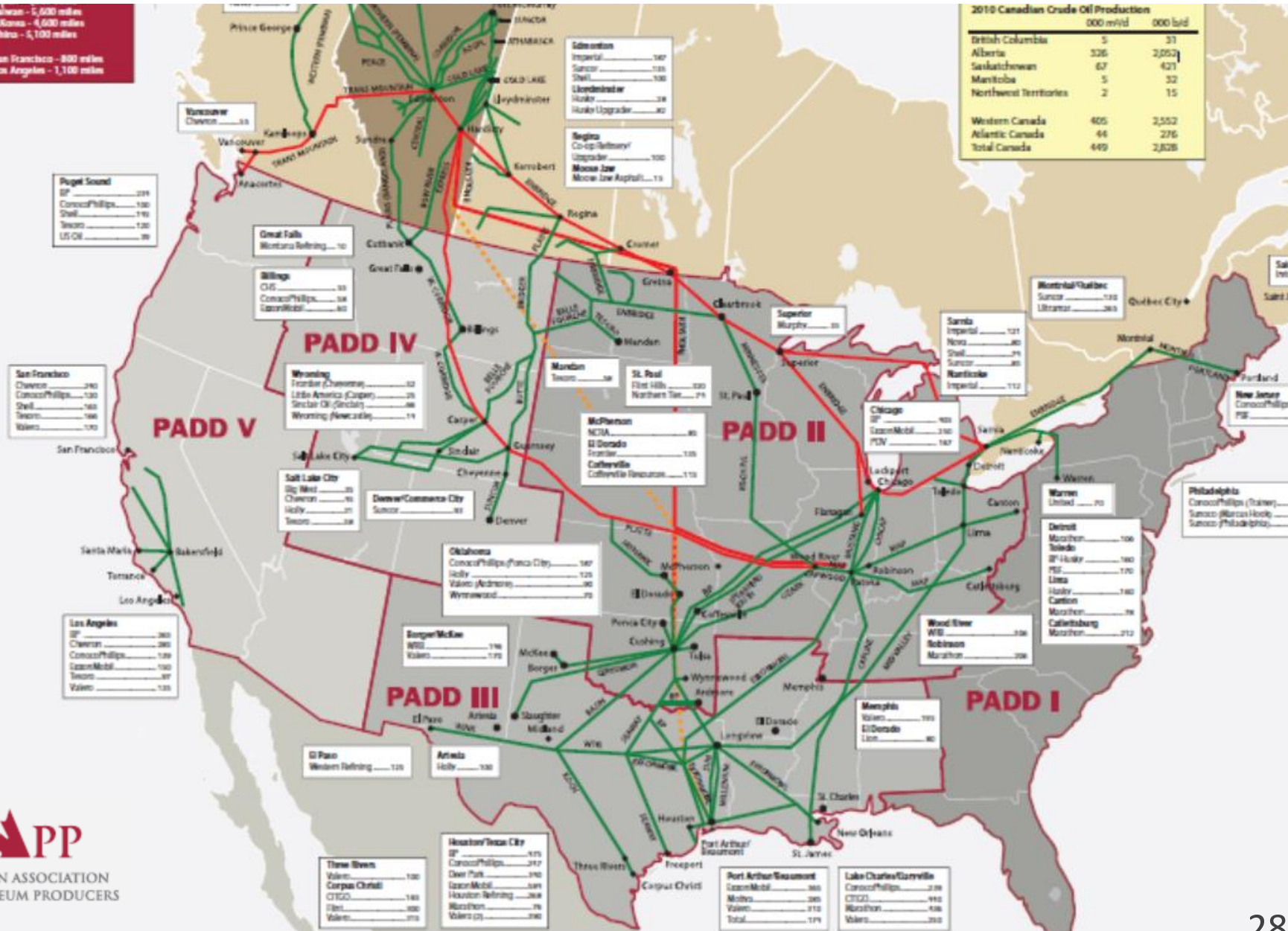
Source: Jodi Quinnell, BENTEK Energy - Sept 12, 2012 "Crude Awakening"

Pipeline Challenges Outside ND

Talwan - 5,600 miles
 S. Korea - 4,600 miles
 China - 5,100 miles

San Francisco - 800 miles
 Los Angeles - 1,100 miles

2010 Canadian Crude Oil Production		
	000 m/b/d	000 b/d
British Columbia	5	31
Alberta	326	2,052
Saskatchewan	67	421
Manitoba	5	32
Northwest Territories	2	15
Western Canada	405	2,552
Atlantic Canada	44	276
Total Canada	449	2,828



Pugget Sound	
BP	234
ConocoPhillips	100
Shell	170
Tosco	120
USOC	70

Great Falls	
Montara Refining	10

Billings	
CVS	80
ConocoPhillips	58
ExxonMobil	80

San Francisco	
Chesapeake	210
ConocoPhillips	120
Shell	160
Tosco	160
Valero	100

Los Angeles	
BP	280
Chesapeake	280
ConocoPhillips	190
ExxonMobil	190
Tosco	87
Valero	120

Three Rivers	
Valero	100
Corpus Christi	180
CTCO	180
Shell	200
Valero	270

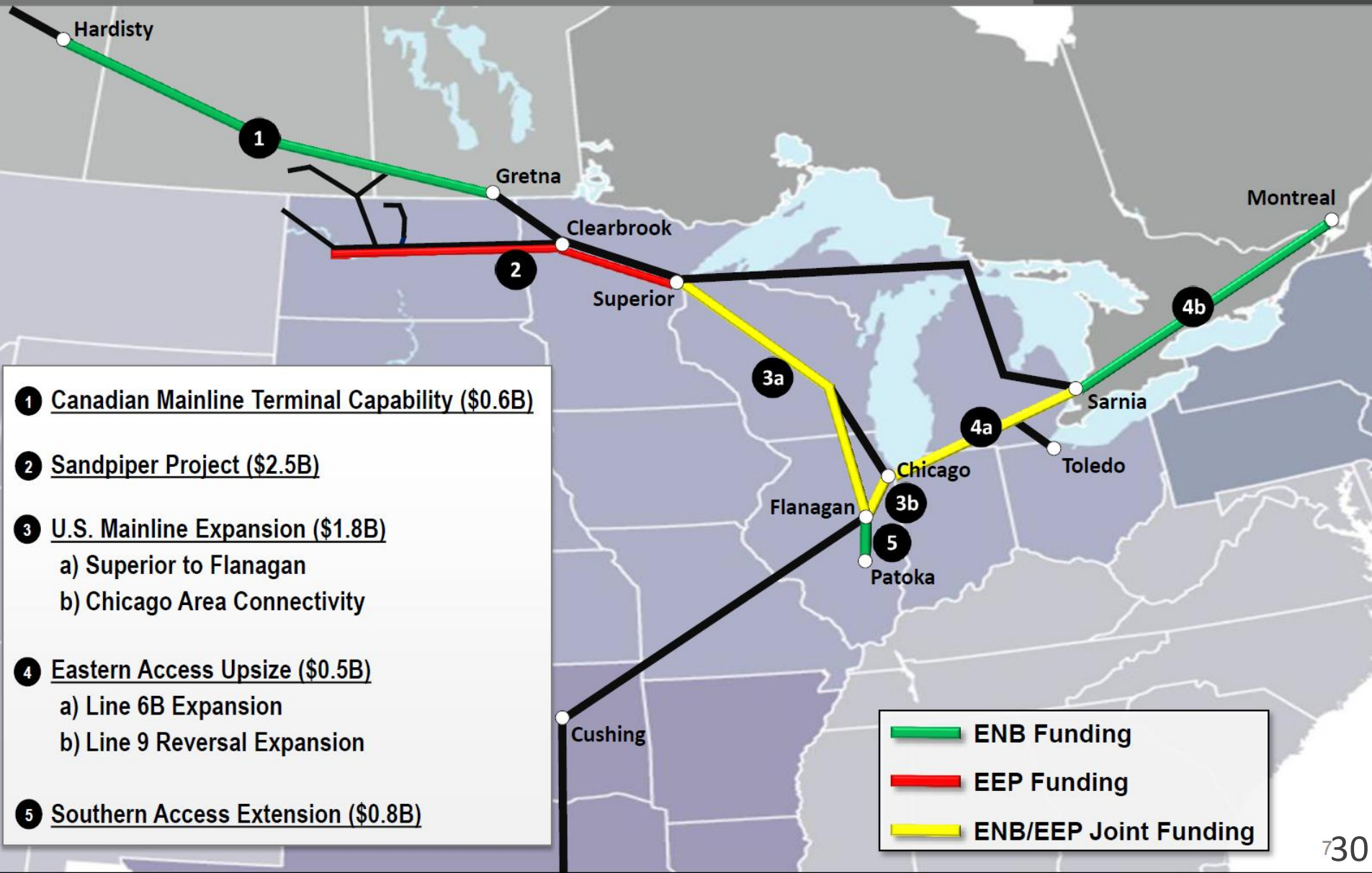
Houston/Texas City	
BP	370
ConocoPhillips	217
Deer Park	370
ExxonMobil	325
Houston Refining	264
Marathon	70
Valero (2)	290

Port Arthur/Texasport	
ExxonMobil	360
Mothers	360
CTCO	210
Total	1190

Lake Charles/Garrville	
ConocoPhillips	238
CTCO	410
Marathon	438
Valero	310

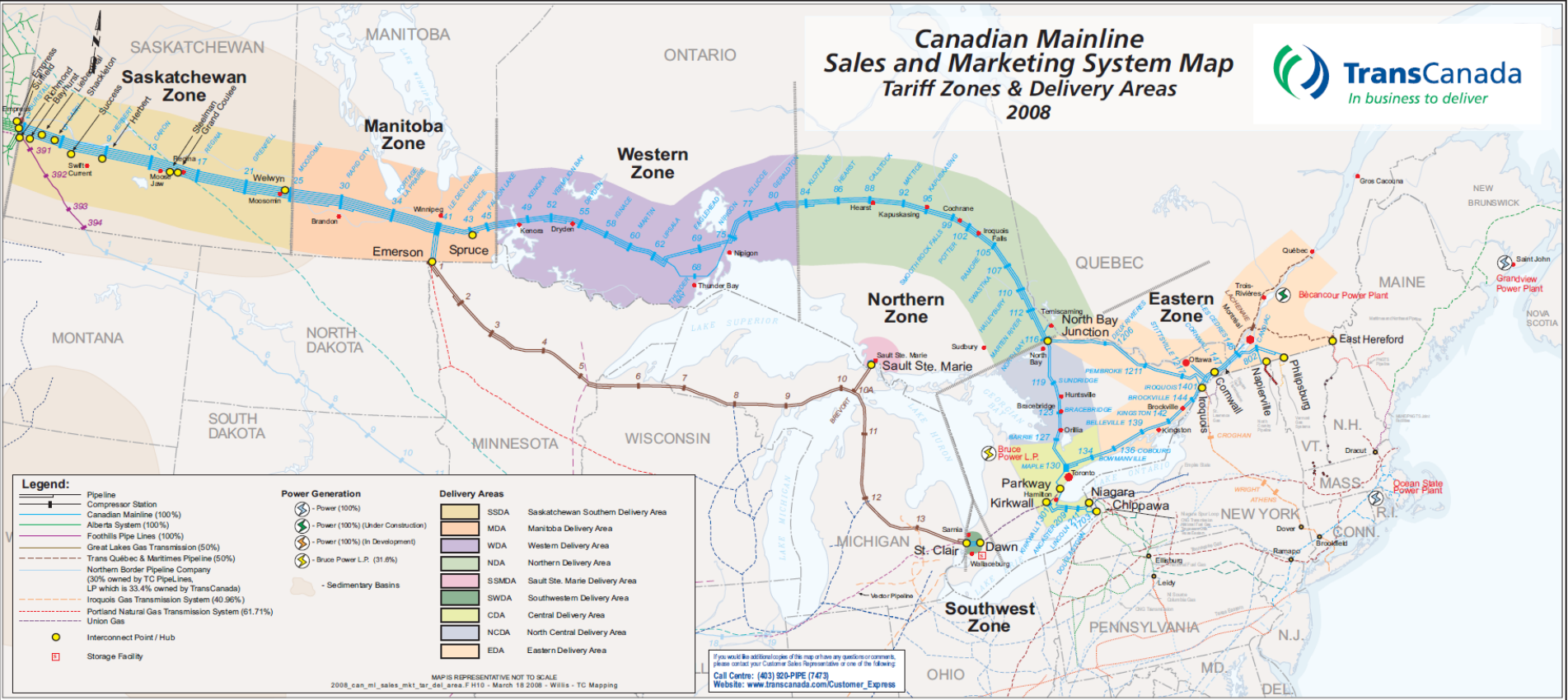
Two Projects to Watch...

\$6.2 Billion – Light Oil Market Access



TransCanada Mainline Conversion

Canadian Mainline Sales and Marketing System Map Tariff Zones & Delivery Areas 2008



Natural Gas

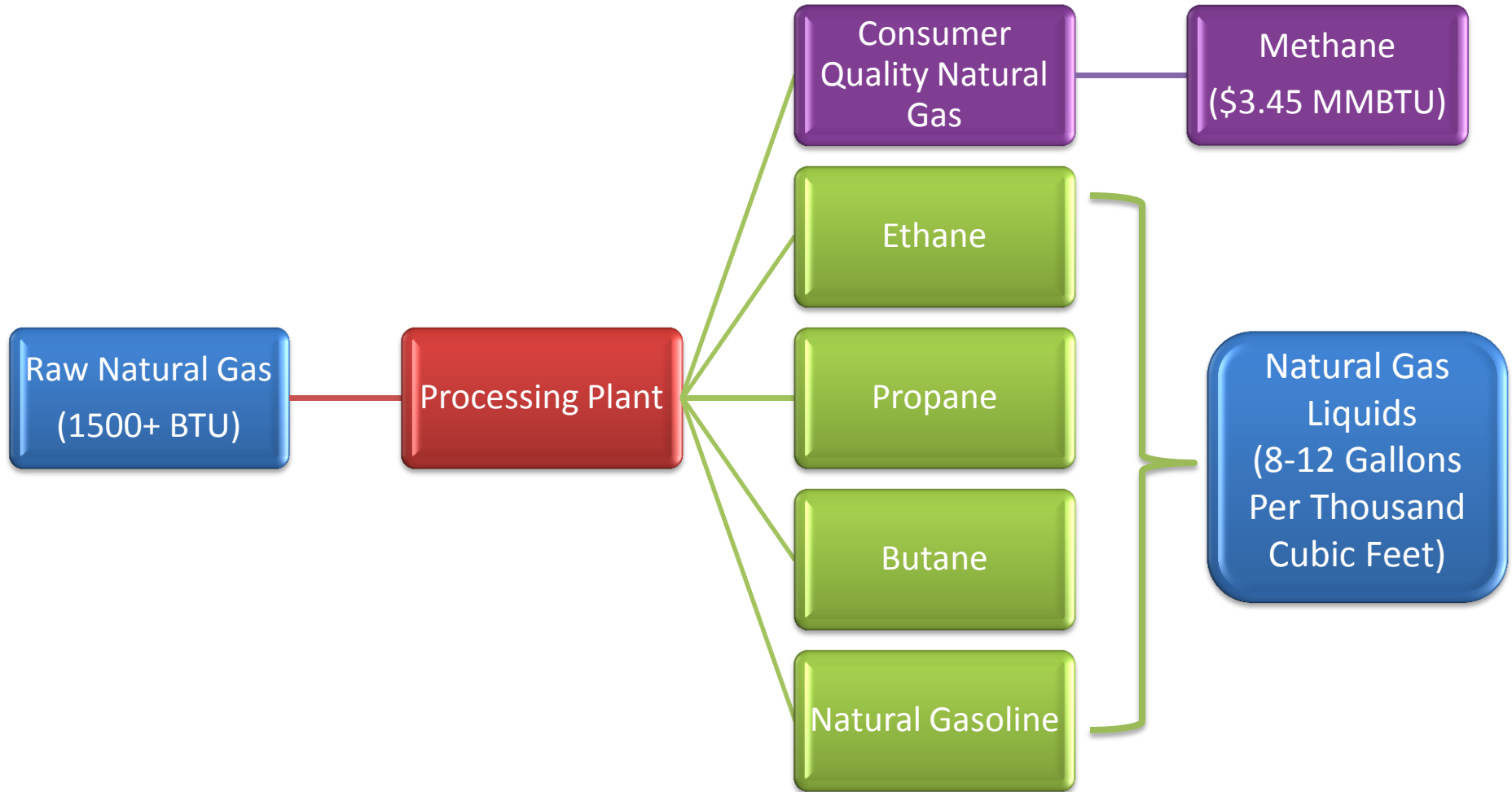


Top Two Natural Gas Misconceptions

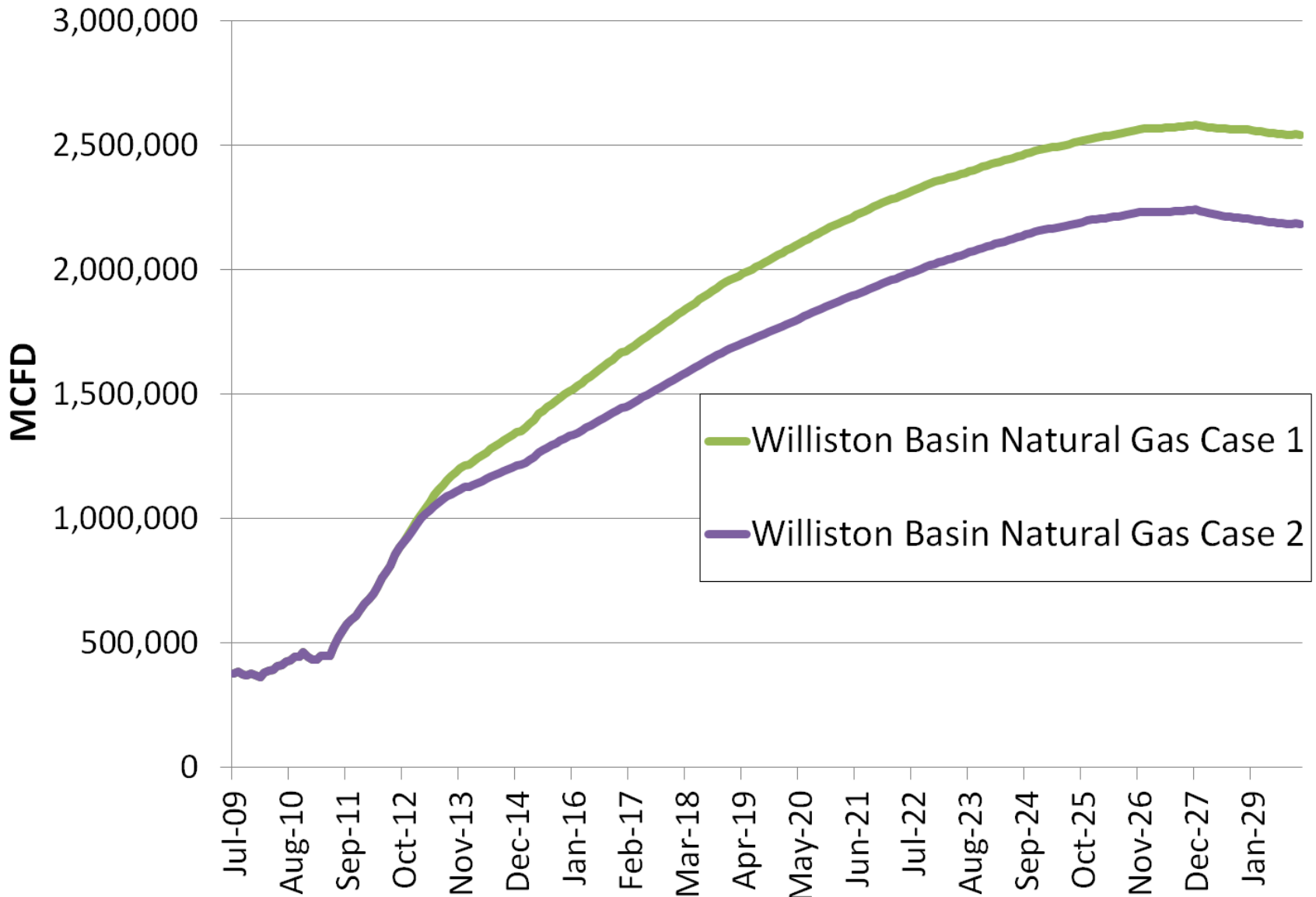
“Natural gas is just a byproduct of oil production with very little economic value.”

“Nothing is being done to address natural gas flaring in western North Dakota.”

Rich Bakken Natural Gas

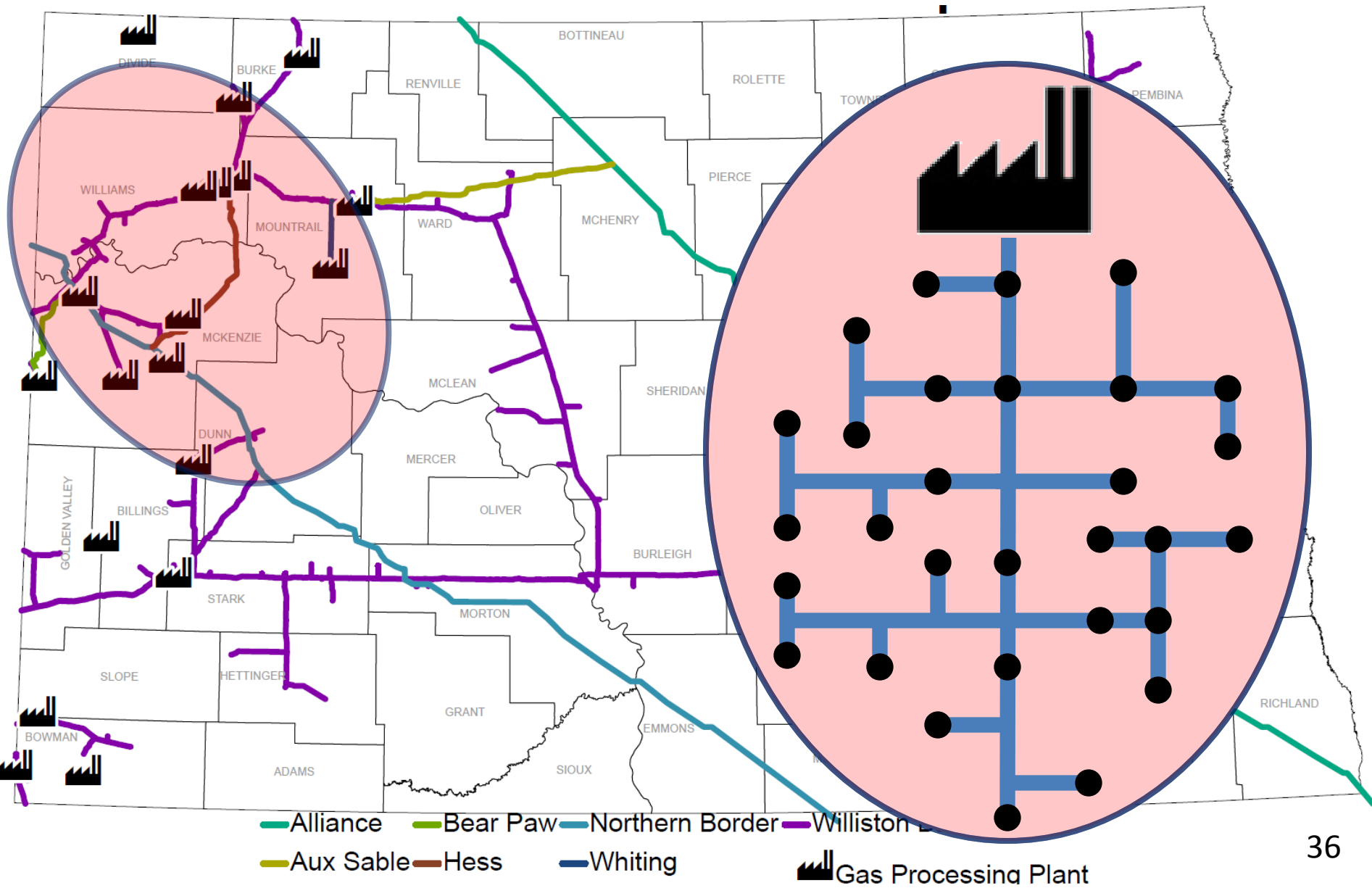


Williston Basin Gas Production

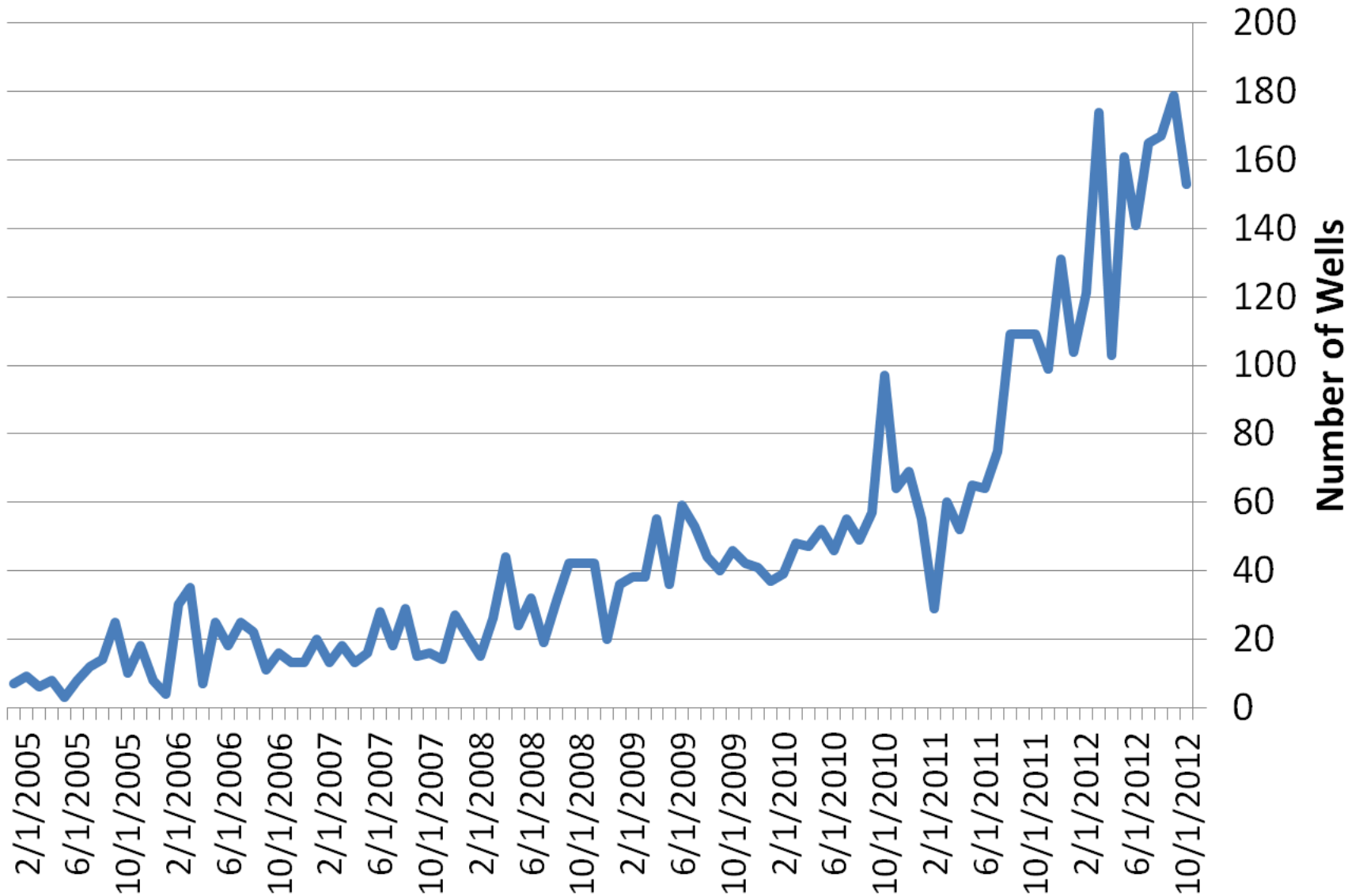


Production forecast is for visual demonstration purposes only and should not be considered accurate for any near or long term planning.

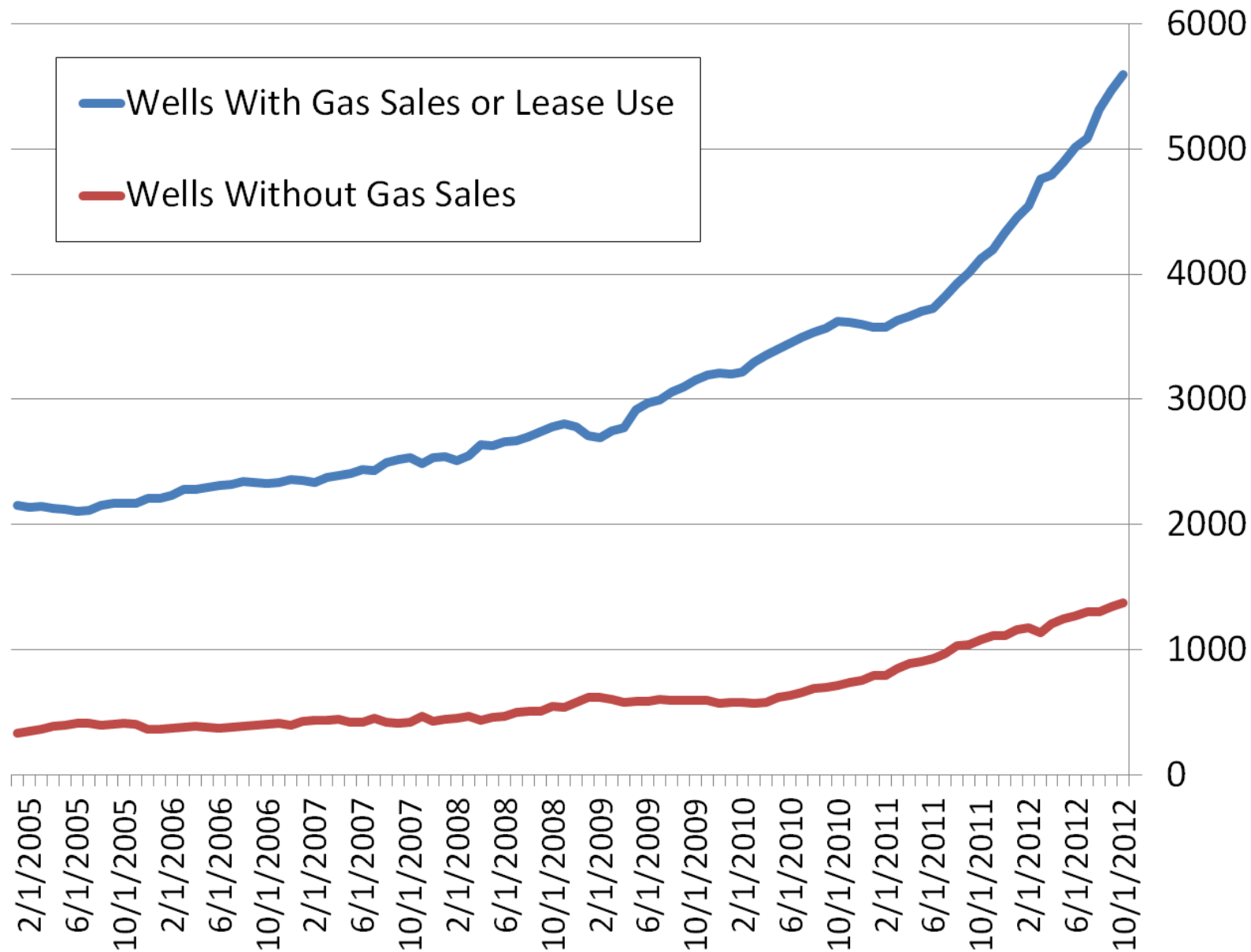
Natural Gas Gathering Challenge



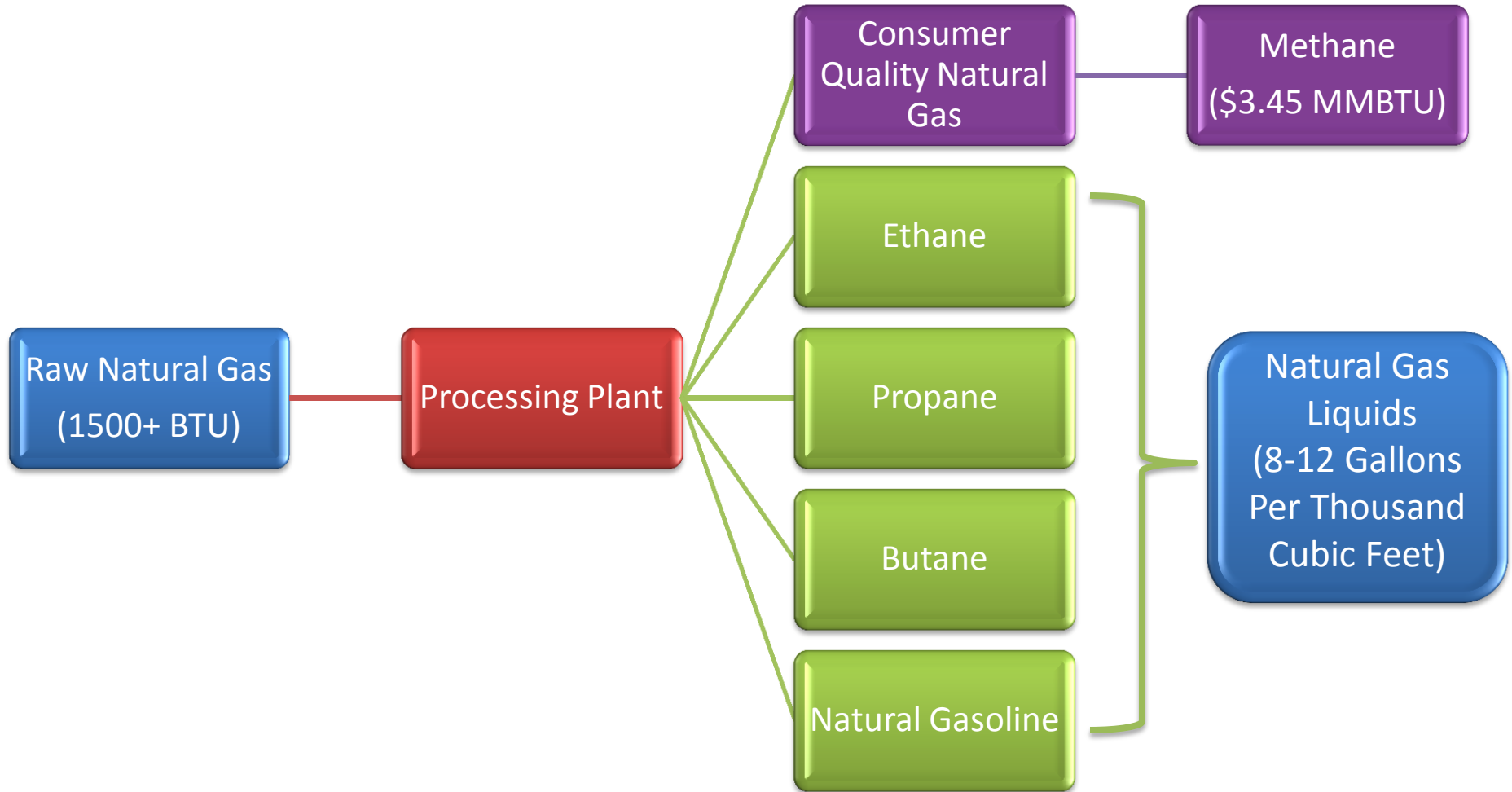
First Time Gas Sales Per Month



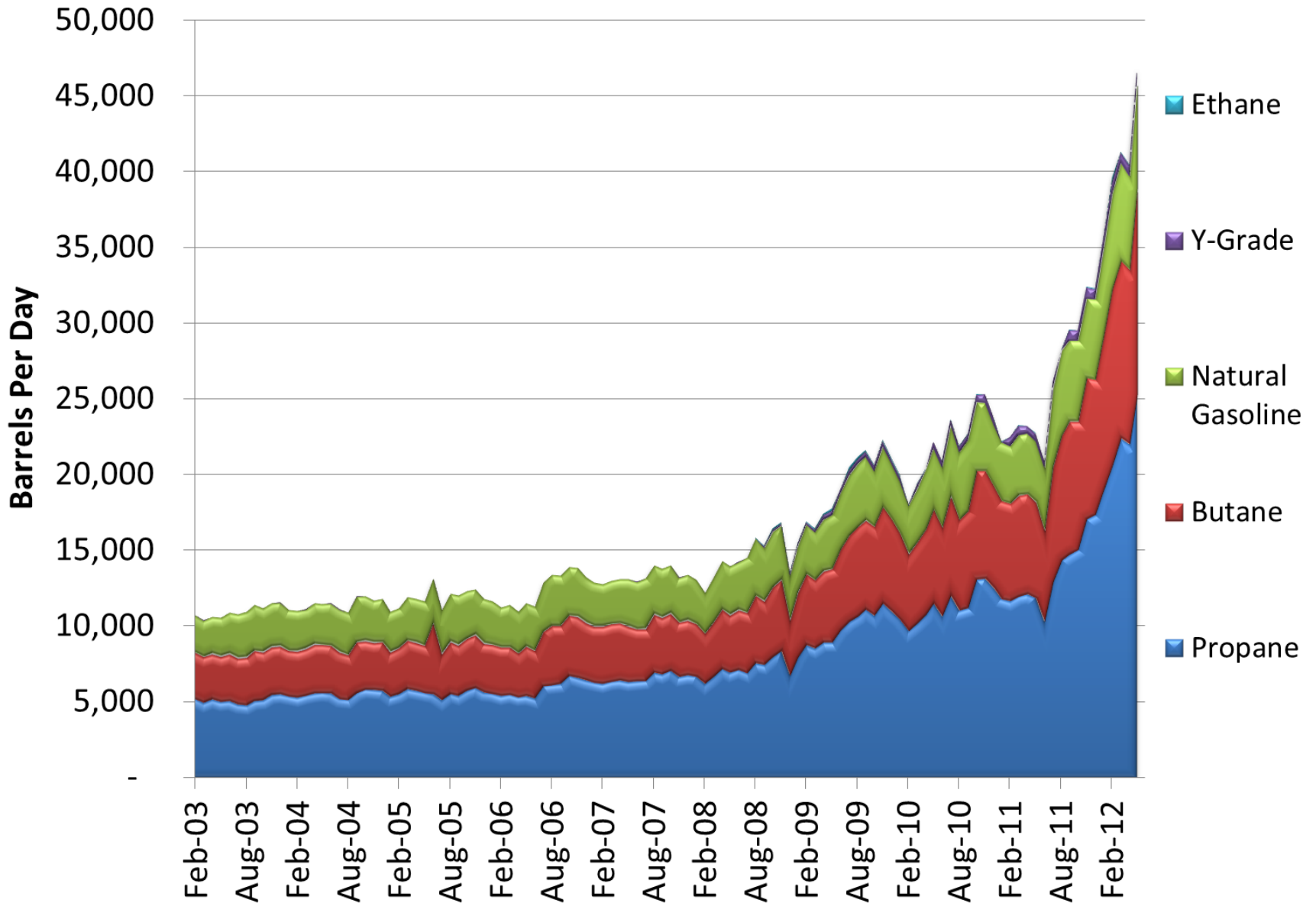
ND Gas Gathering Statistics



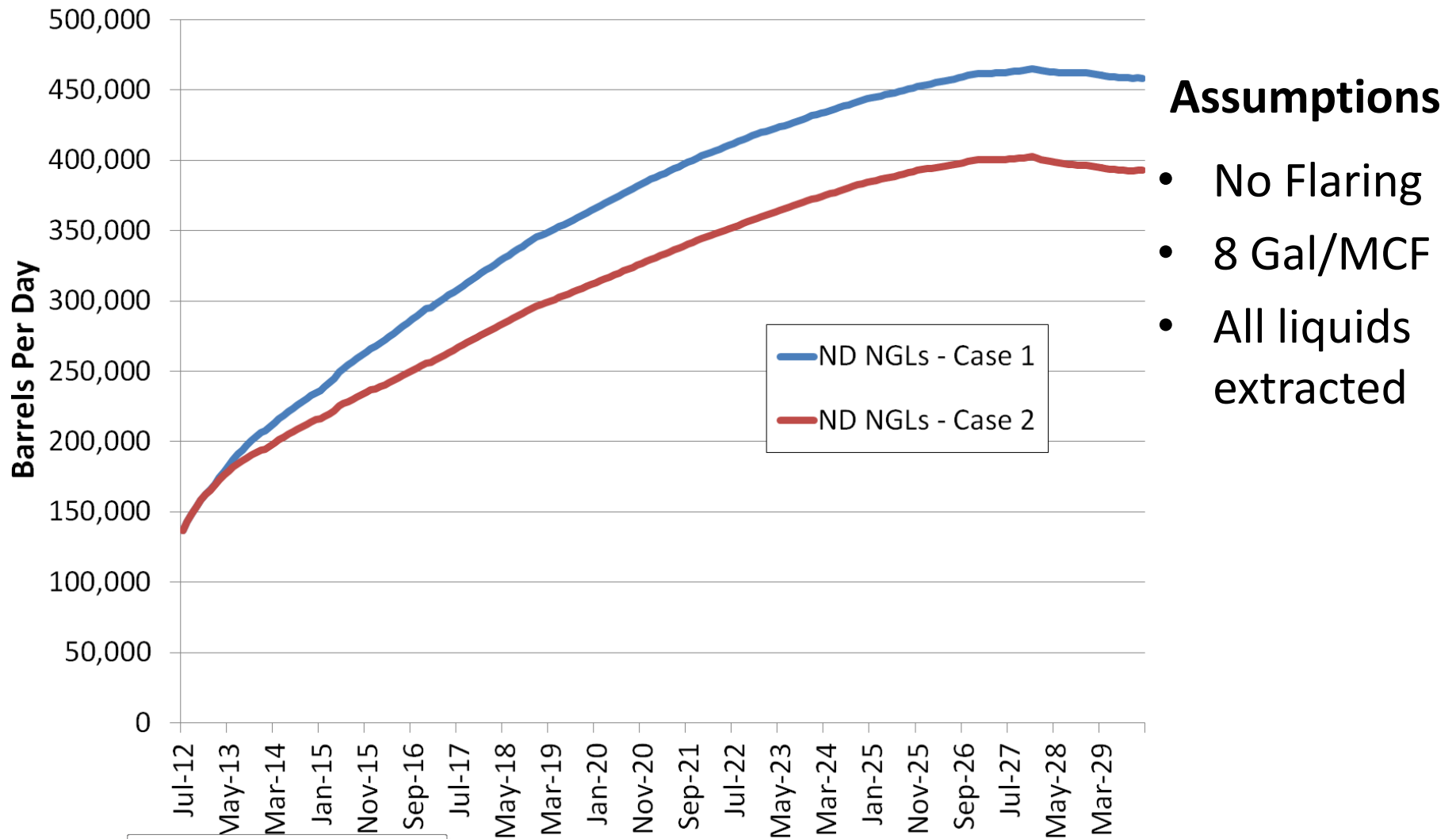
Rich Bakken Natural Gas



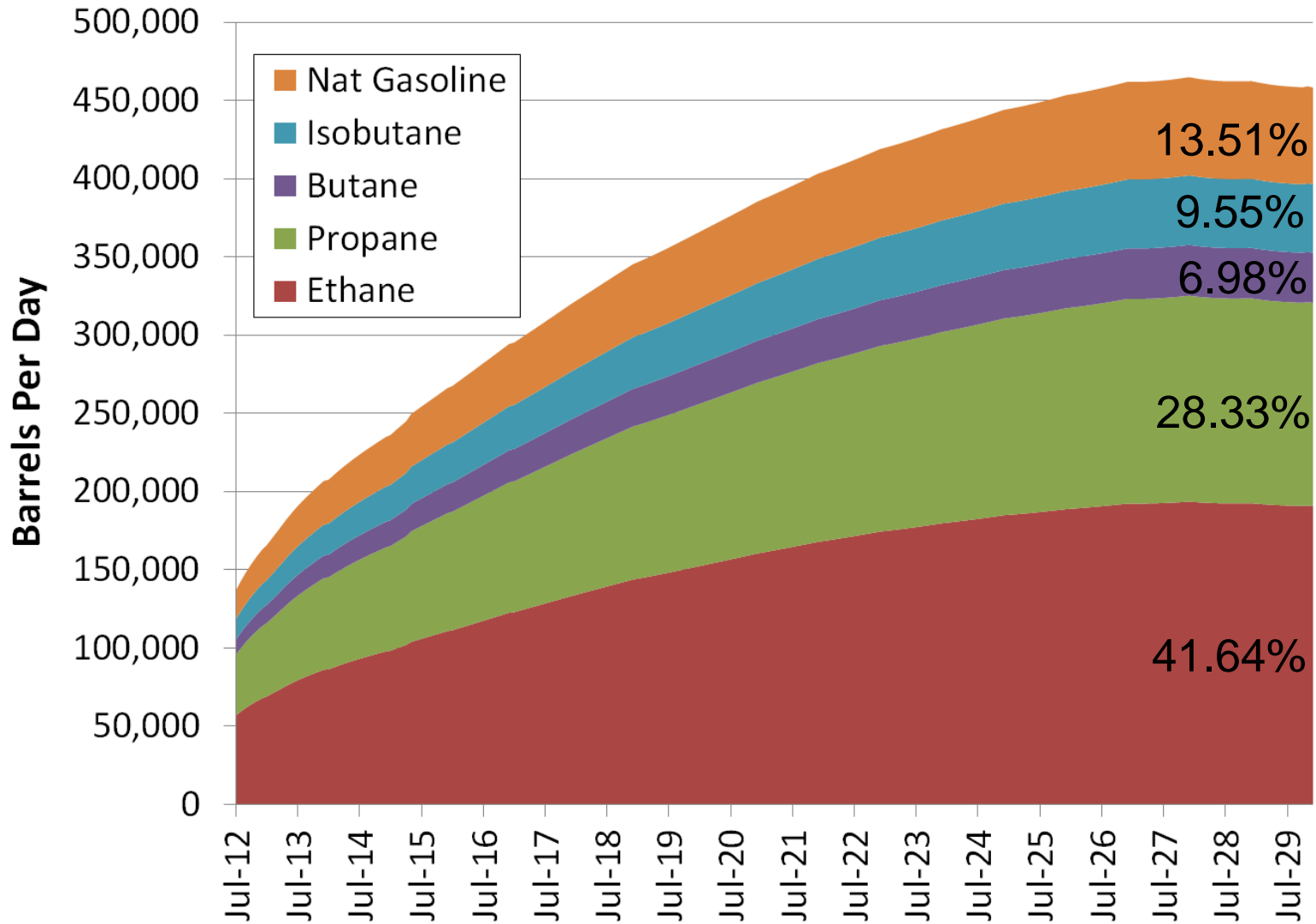
ND Gas Plant NGL Production



North Dakota NGL Potential

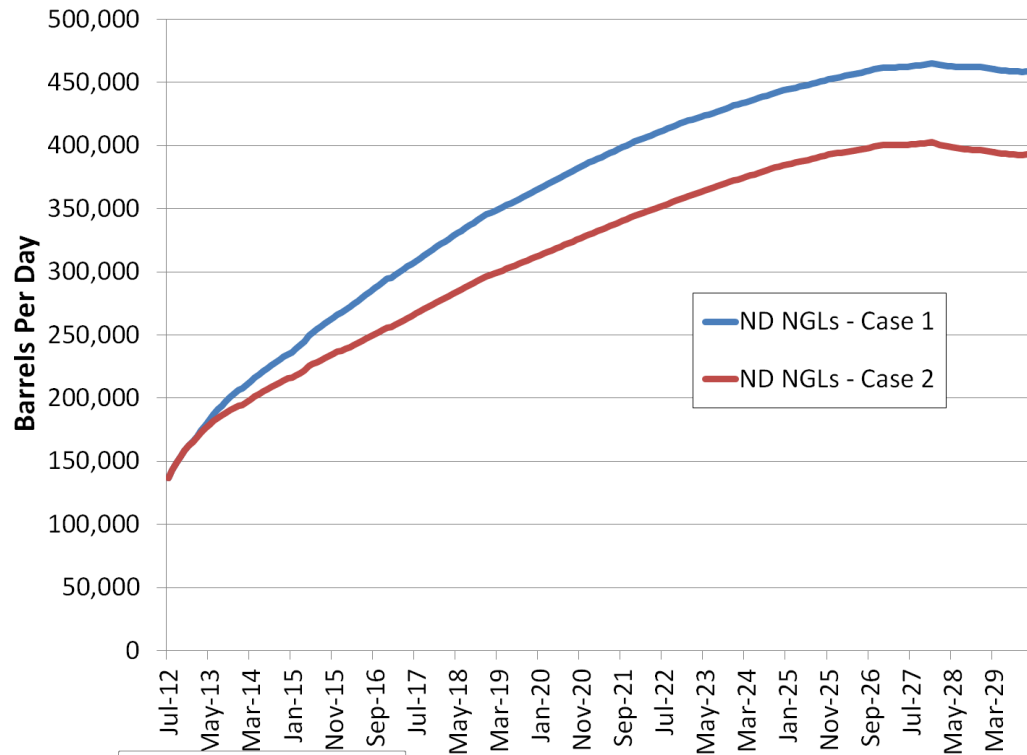


Case 1: ND NGL Potential*



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

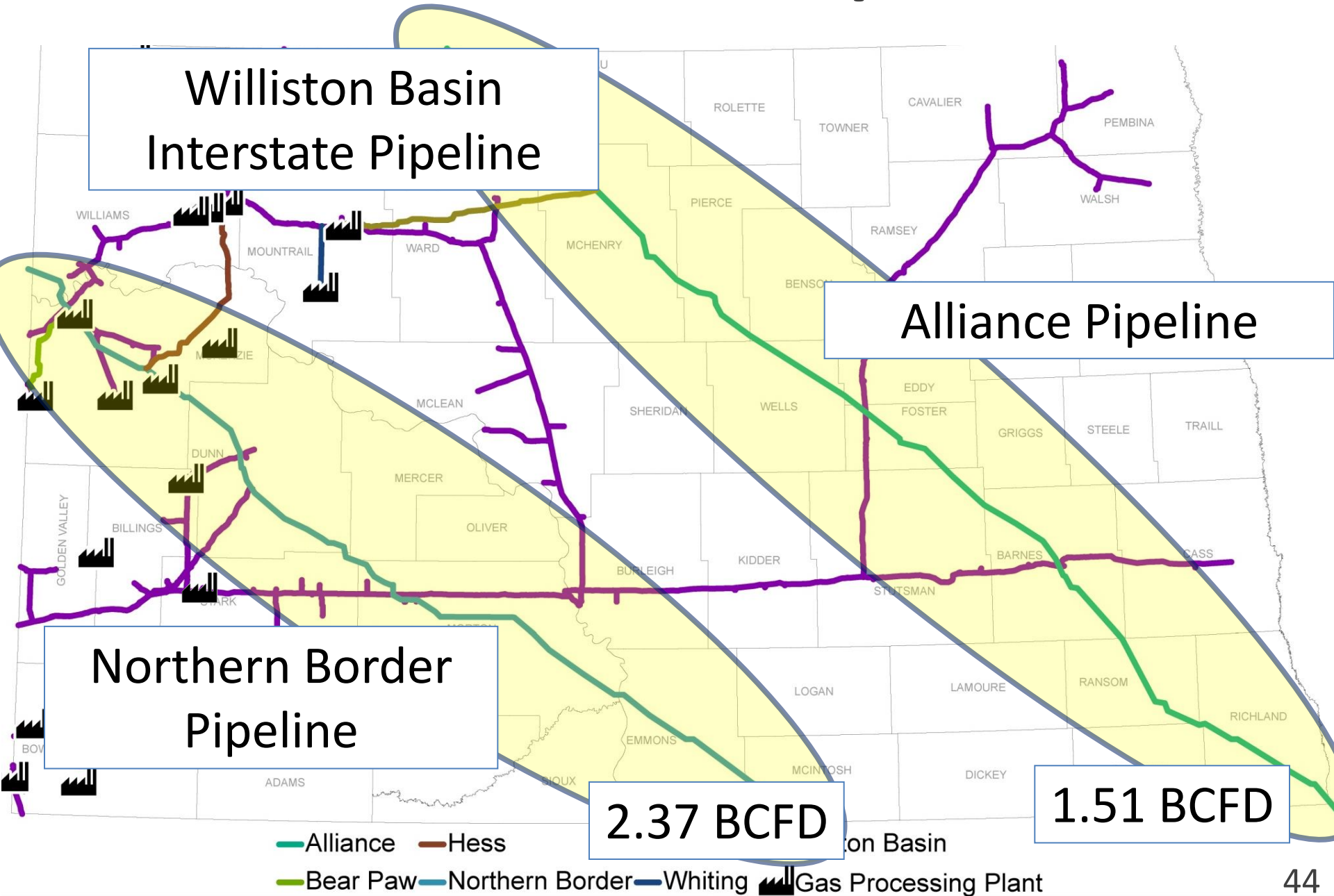
Moving Future NGL Volumes



Transportation Options

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

ND Natural Gas Pipelines



Natural Gas Study

WILLISTON BASIN

The Williston Basin:
Greasing the Gears for Growth in North Dakota

BENTEK
Energy

WEBINARS

December 18, 2012 – Natural Gas Flaring Alternatives [Slides](#)

December 18, 2012 – Natural Gas Flaring Alternatives

June - December 2012
24,000+ views

EXPANSION NDPA Gas Flaring Alternatives 12-18-2012

DRESSER-RAND

“VX Cycle” Applications



Upstream

- Monetize associated gas at oil wells
 - Eliminate gas flaring
- Separate NGLs from feed gas (with optional “bolt-on” units)
- Stranded gas fields w/o pipelines
- LNG fuel to replace diesel for:
 - Drilling rigs
 - Hydraulic fracturing pumps
 - Field trucks
 - Construction equipment

Midstream

- Peak-shaving gas storage facilities
- LNG for shipping to remote communities
- LNG for shipping to remote industrial & mining sites

Downstream

- “Distributed” production of vehicle-grade LNG at fueling stations (replaces diesel fuel)
- Eliminates the need to truck LNG from large, centralized plants to distant fueling depots
- Upgrade existing CNG stations
- Clean, inexpensive LNG fuel for:
 - Long-haul/heavy-duty trucks
 - Delivery fleets

Contact Information

North Dakota Pipeline Authority

600 E. Boulevard Ave. Dept. 405
Bismarck, ND 58505-0840

Phone: (701)220-6227

Fax: (701)328-2820

E-mail: jjkringstad@ndpipelines.com

Websites:

www.pipeline.nd.gov

www.northdakotapipelines.com



Know what's below.
Call before you dig.

