

# Industrial Commission Update

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*Geological Engineer*

*Director*

*North Dakota Pipeline Authority*



**November 25, 2019**

# Natural Gas Update



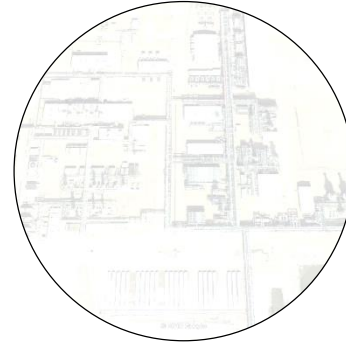
## Production

- Technology
- Markets



## Gathering

- Capacity
- Connections



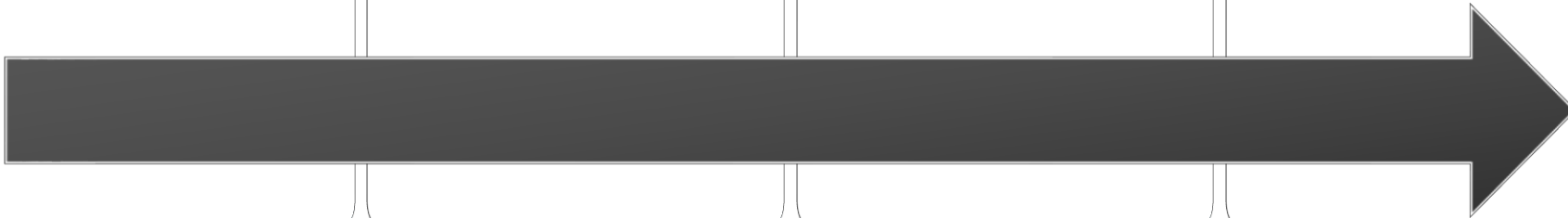
## Processing

- Capacity
- Location

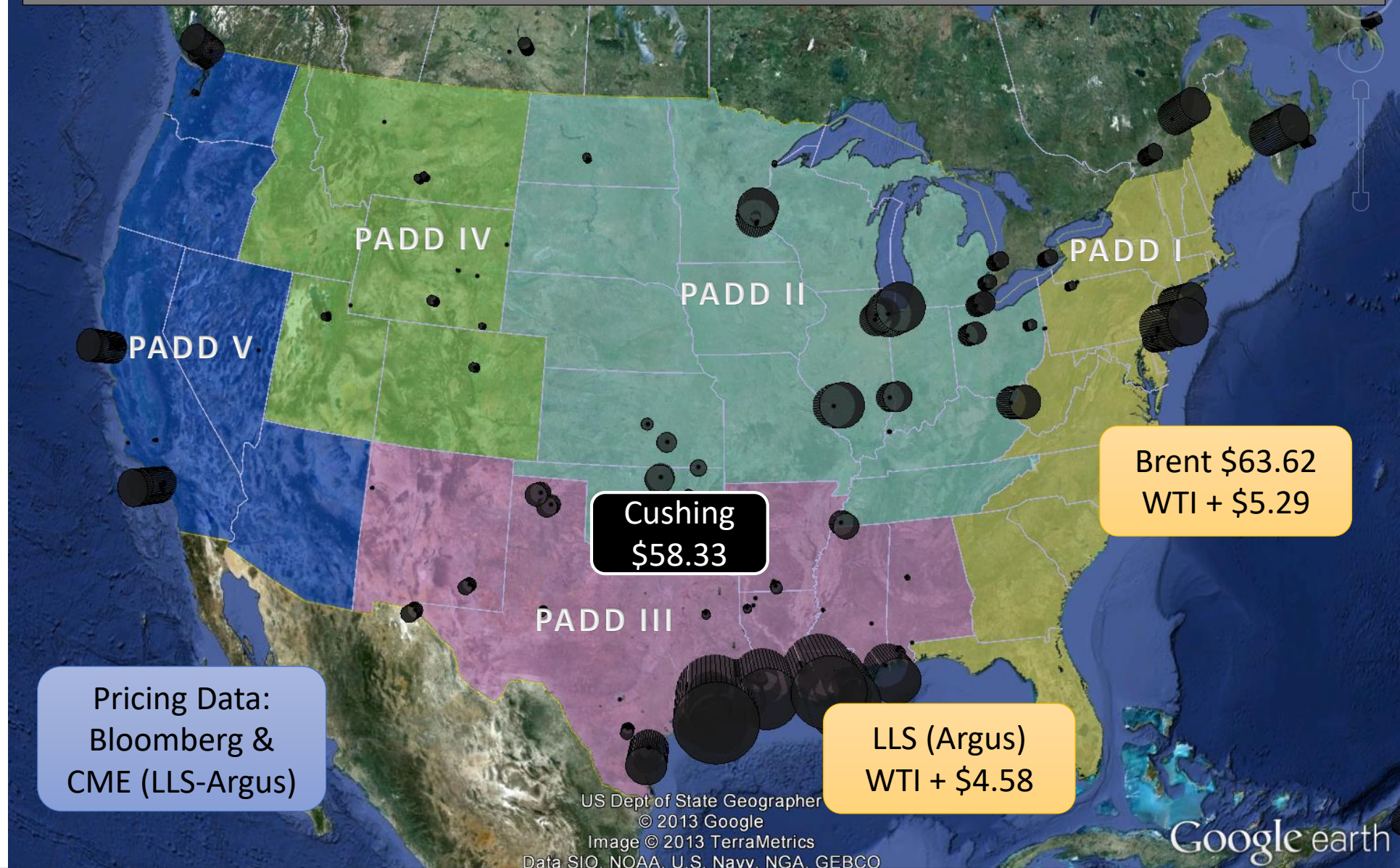


## Transmission

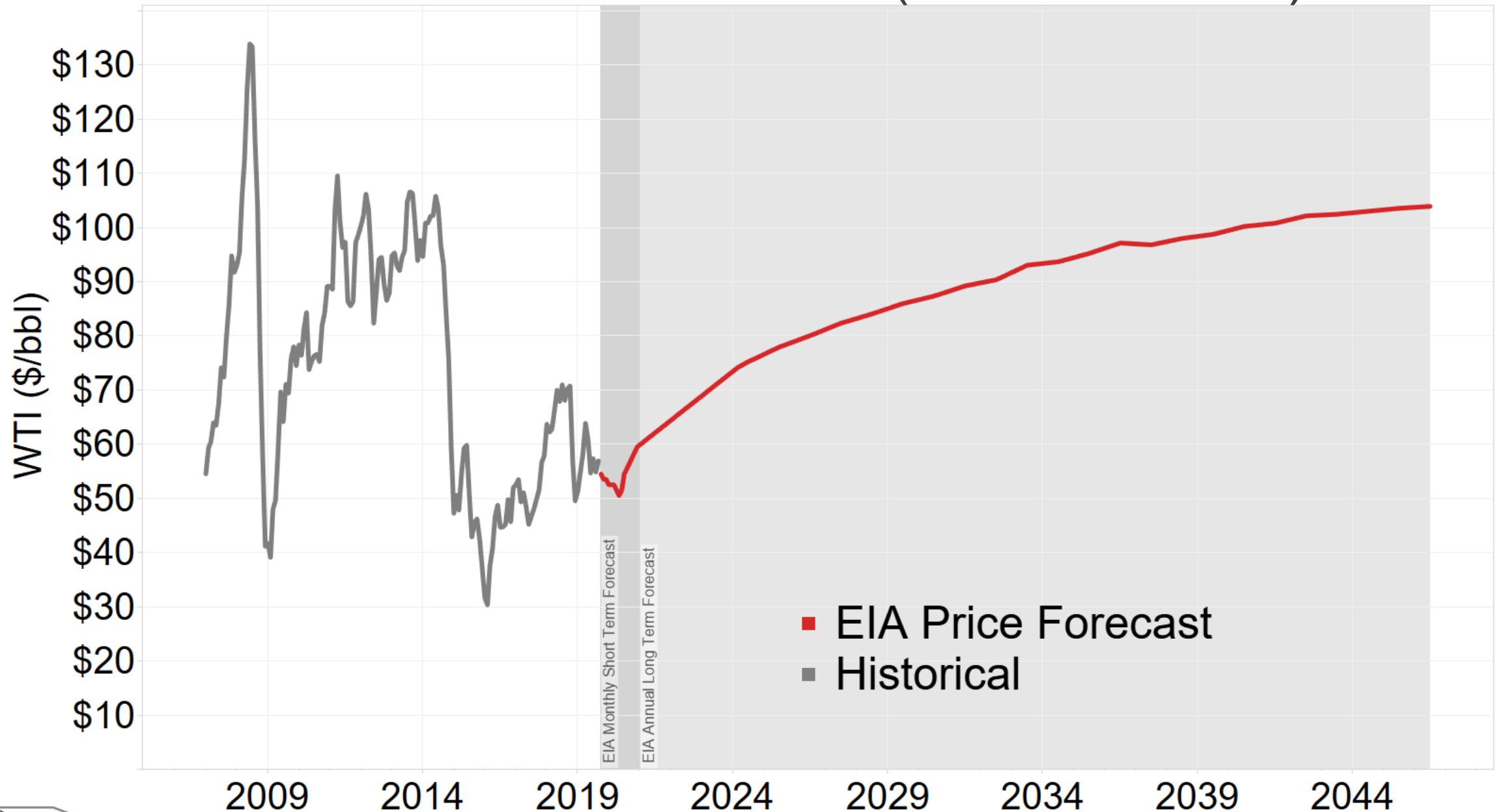
- Dry Gas
- Natural Gas Liquids



# Crude Oil Prices – Nov. 21, 2019

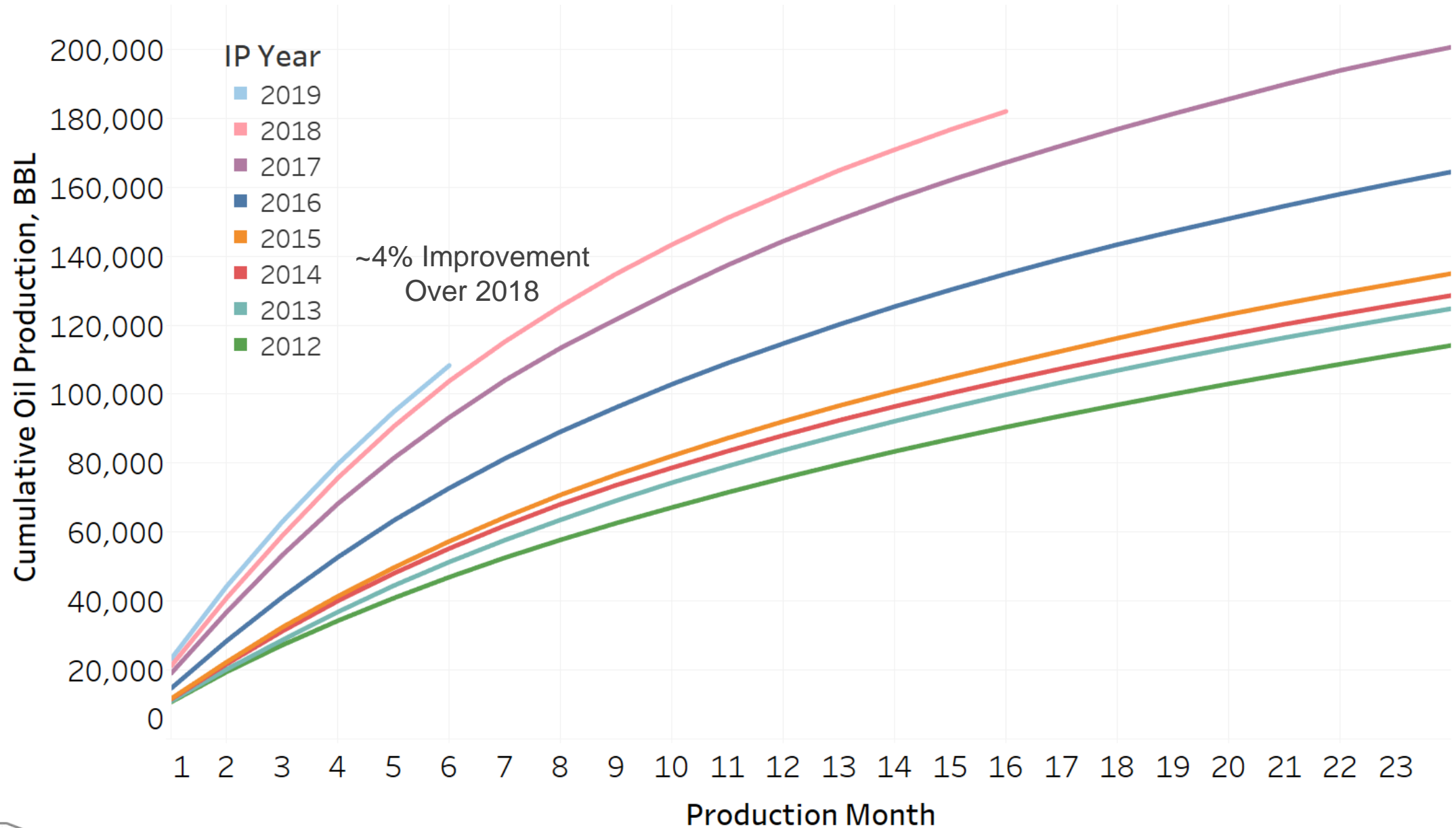


# EIA Forecasted Oil Price (October 2019)



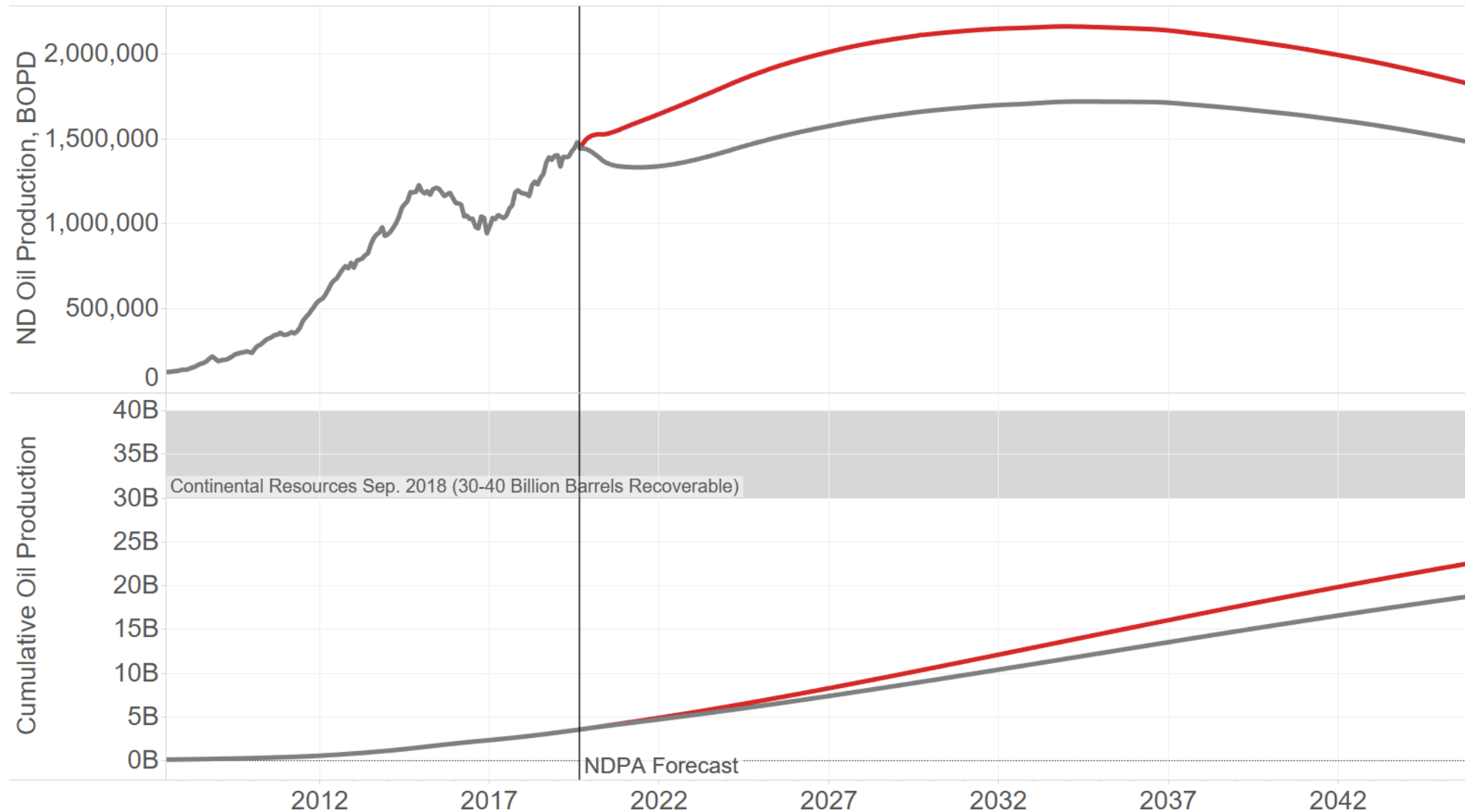


# Statewide oil Performance

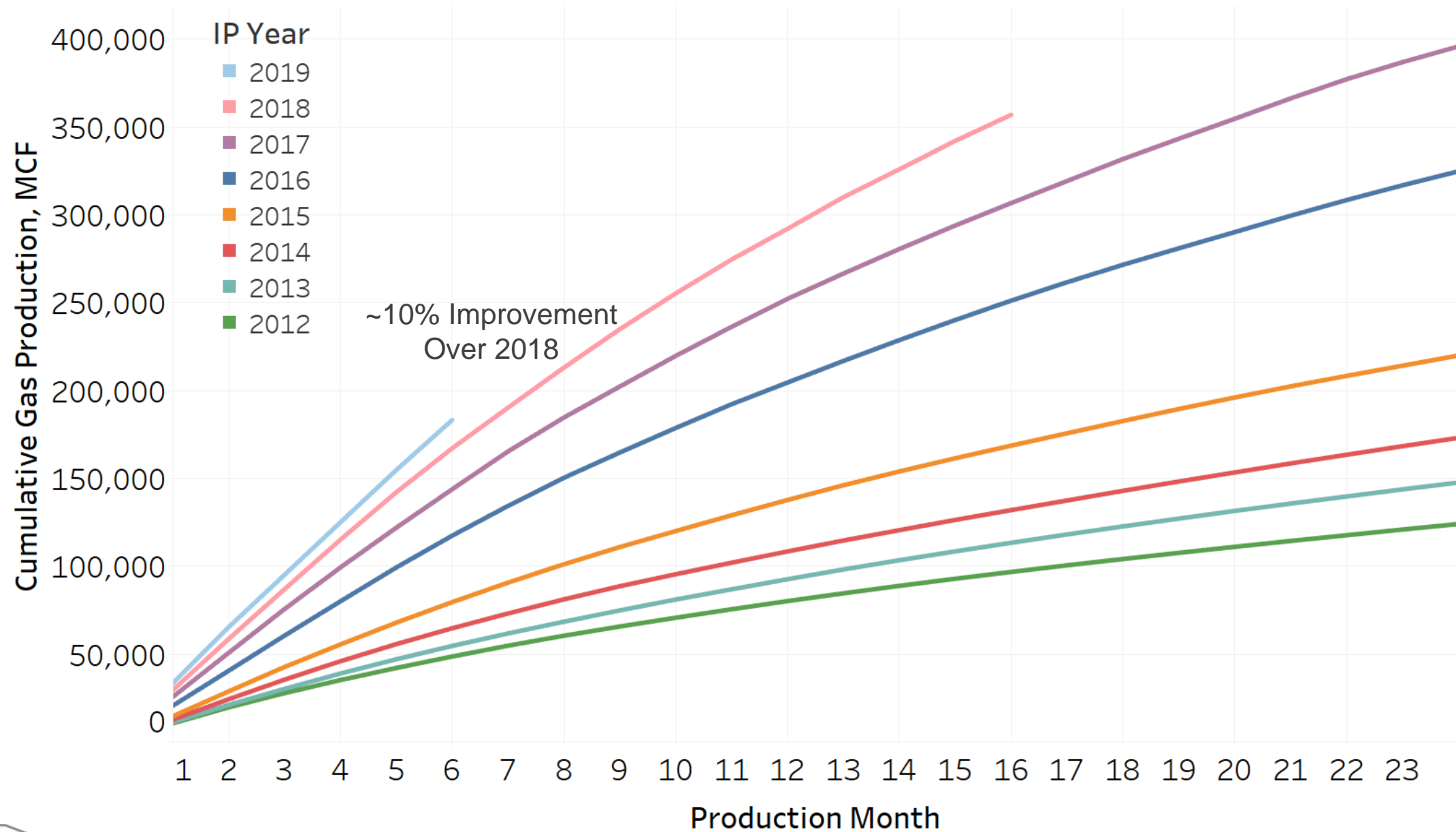


# North Dakota Oil Production Forecast

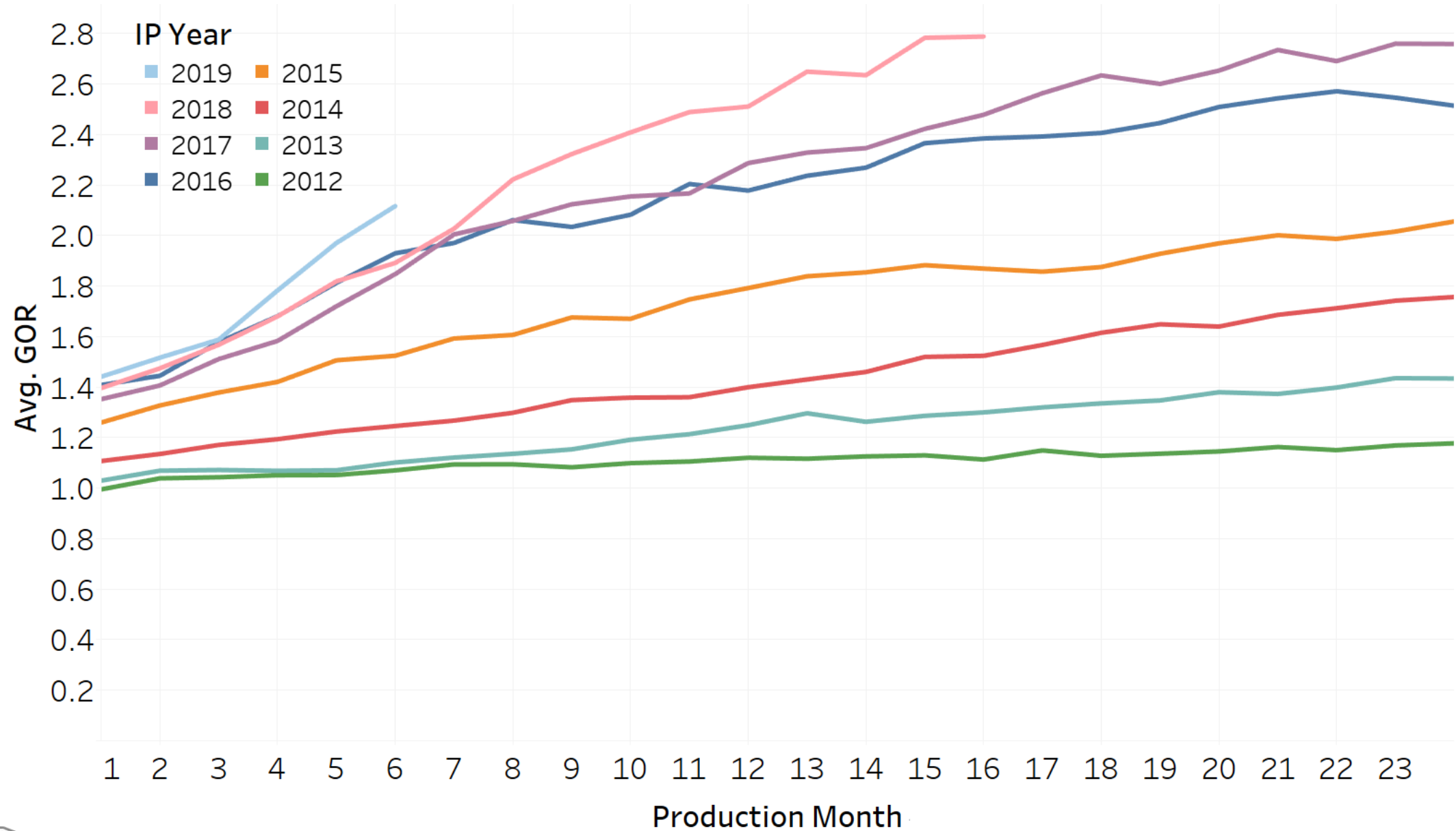
*Assumes Current Technology – Enhanced Oil Recovery Not Included*



# Statewide Gas Performance



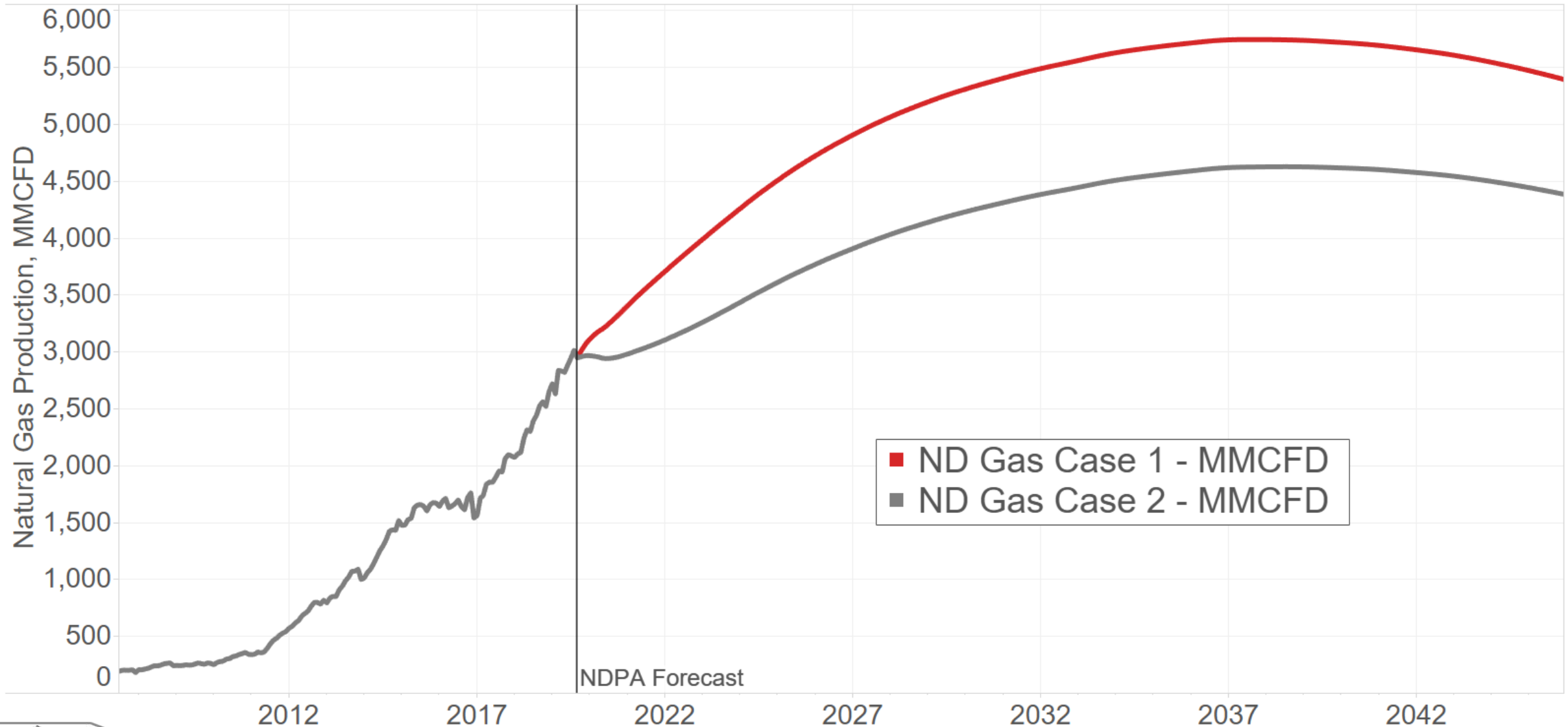
# Statewide Gas-Oil Ratio



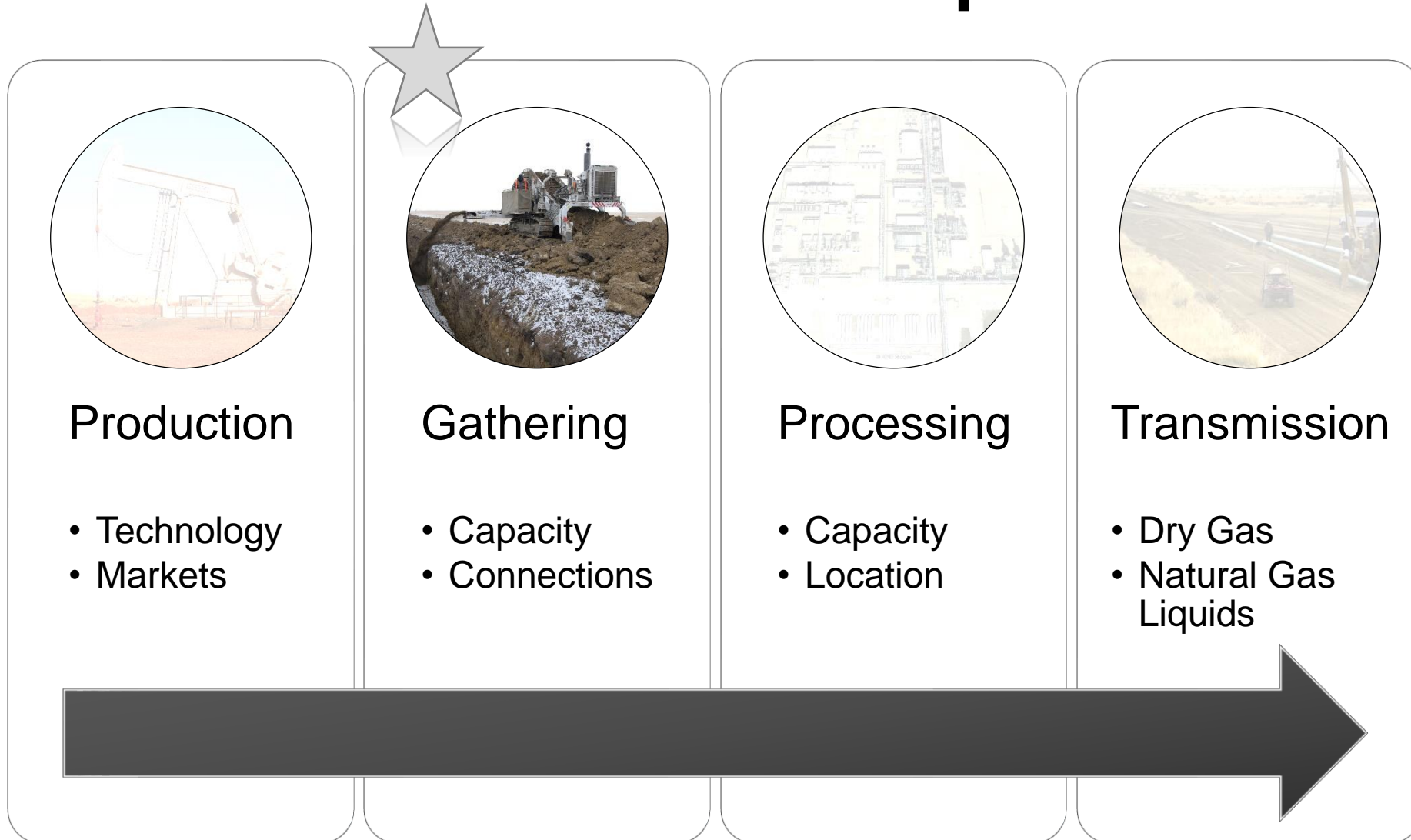


# NDPA North Dakota Gas Production Forecast

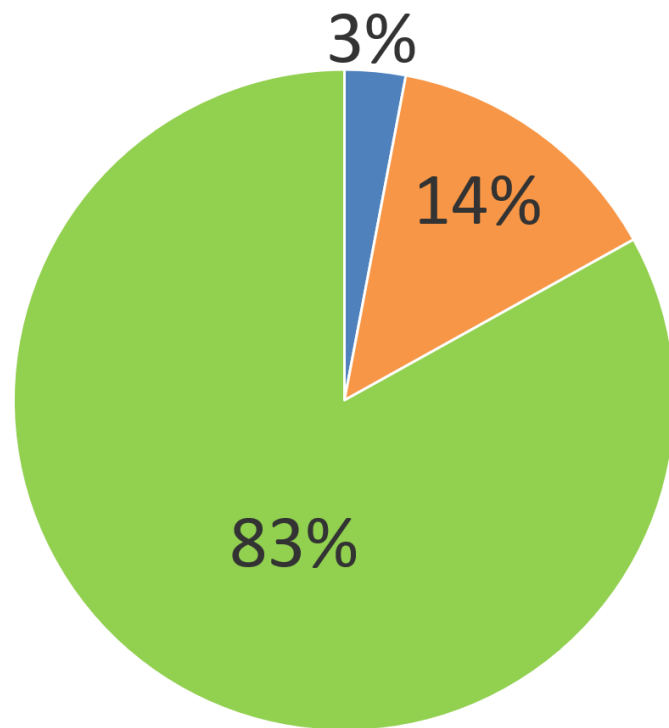
*Assumes Current Technology – Enhanced Oil Recovery Not Included*



# Natural Gas Update



# 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.

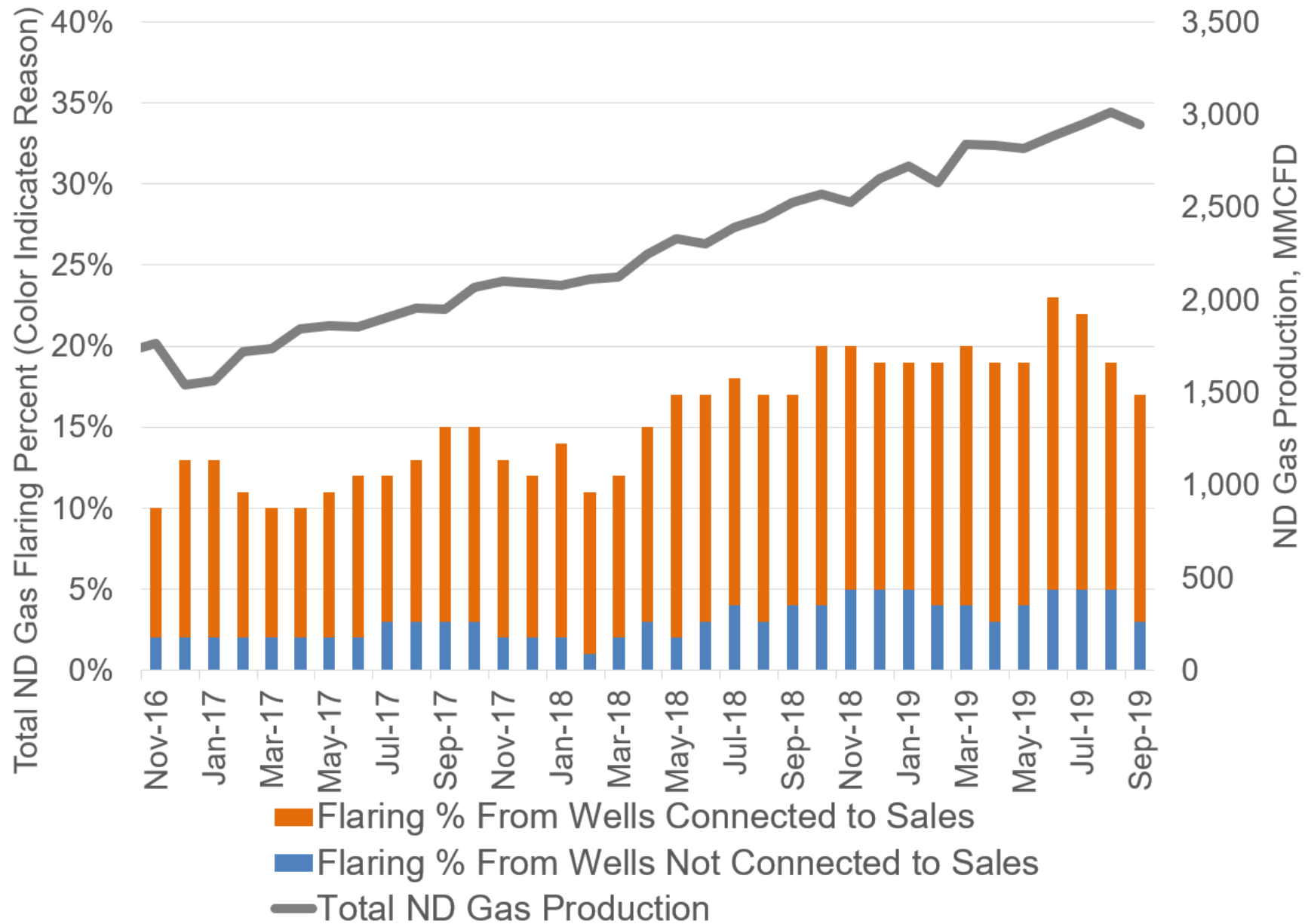
## Simple Terms

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

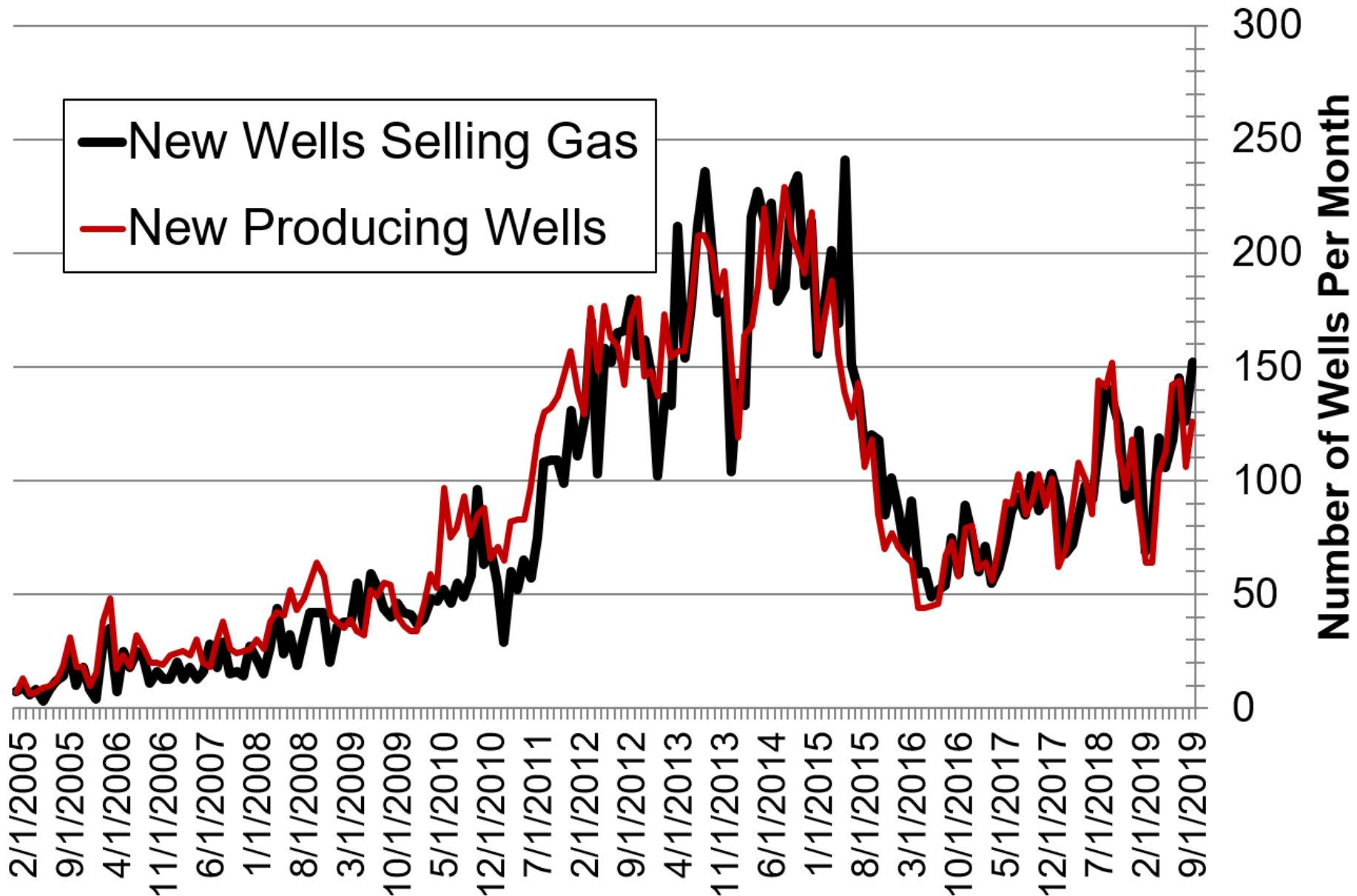
Sep. 2019 Data – Non-Confidential Wells



# Solving the Flaring Challenge

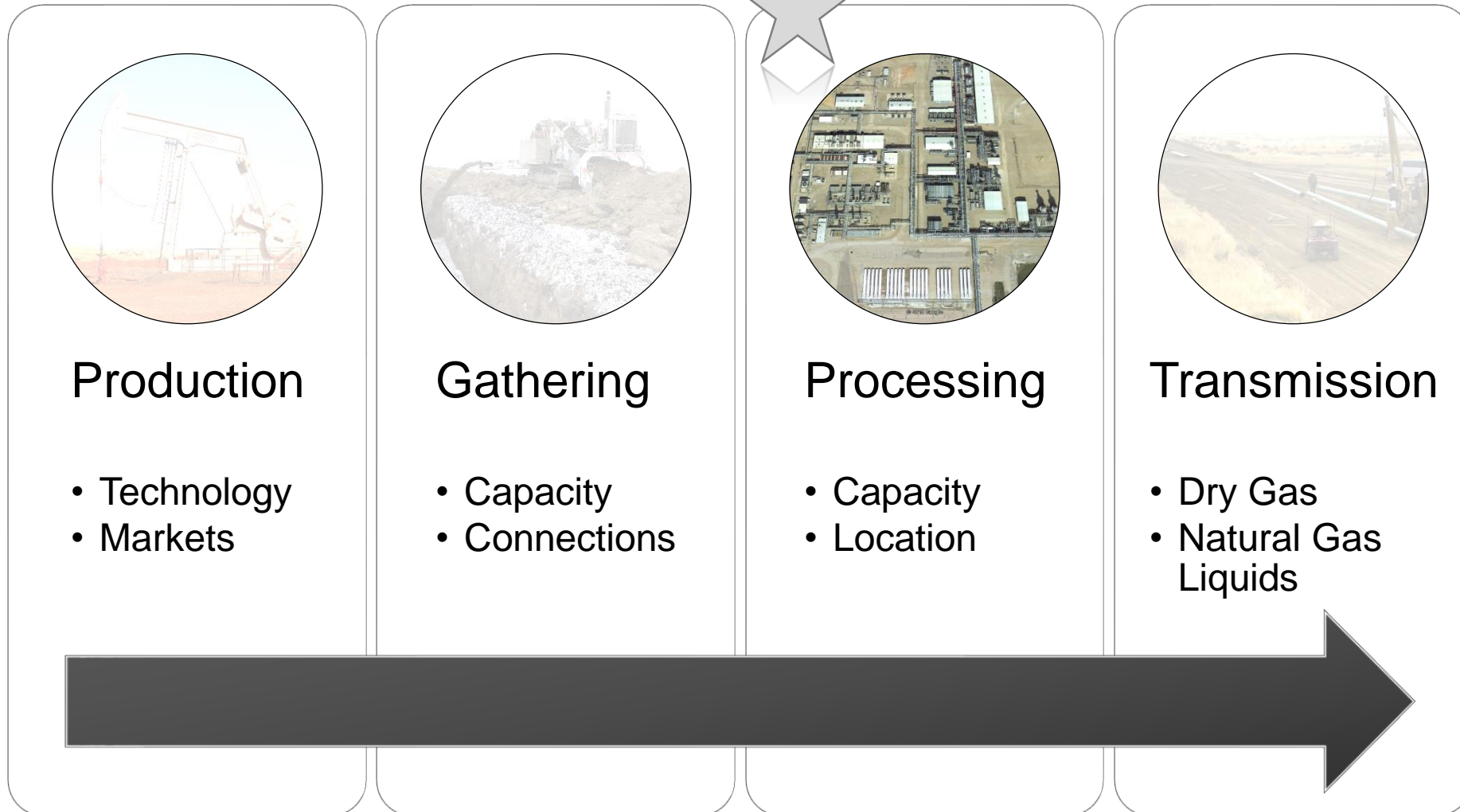


# Solving the Flaring Challenge – Gas Connections

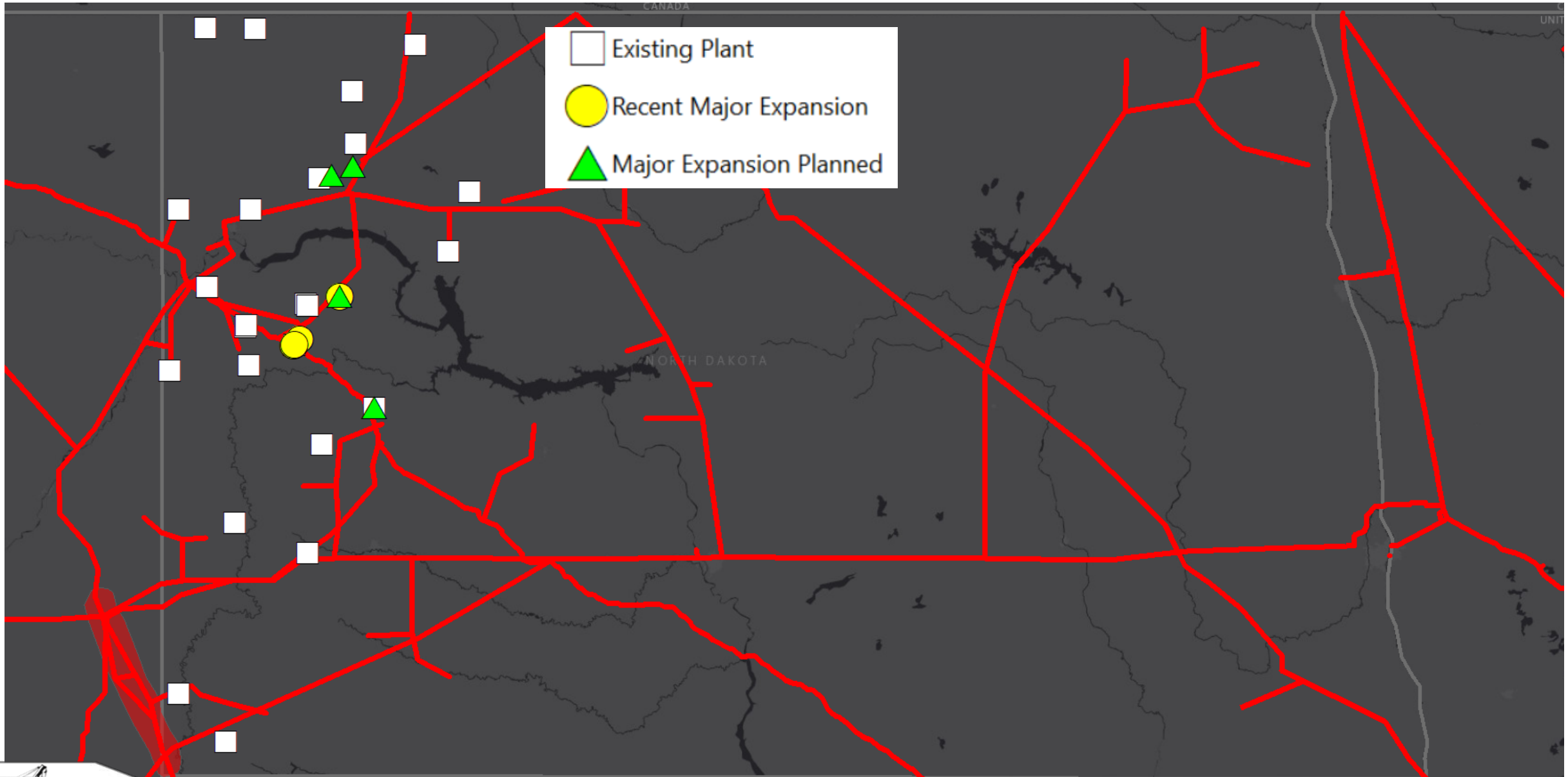




# Natural Gas Update



# Gas Processing Expansions



# Recent Gas Processing Expansions

<b>Plant Name</b>	<b>Plant Operator</b>	<b>County</b>	<b>Additional Expansion Vol., MMCFD</b>	<b>Date</b>
Arrow Bear Den	Arrow Field Services	McKenzie	120	Aug-19
Roosevelt	Kinder Morgan	McKenzie	150	Nov-19
Demicks Lake	ONEOK	McKenzie	200	Nov-19
LM4	Targa/Hess JV	McKenzie	200	Aug-19

**670 MMCFD**

# Planned Gas Processing Expansions

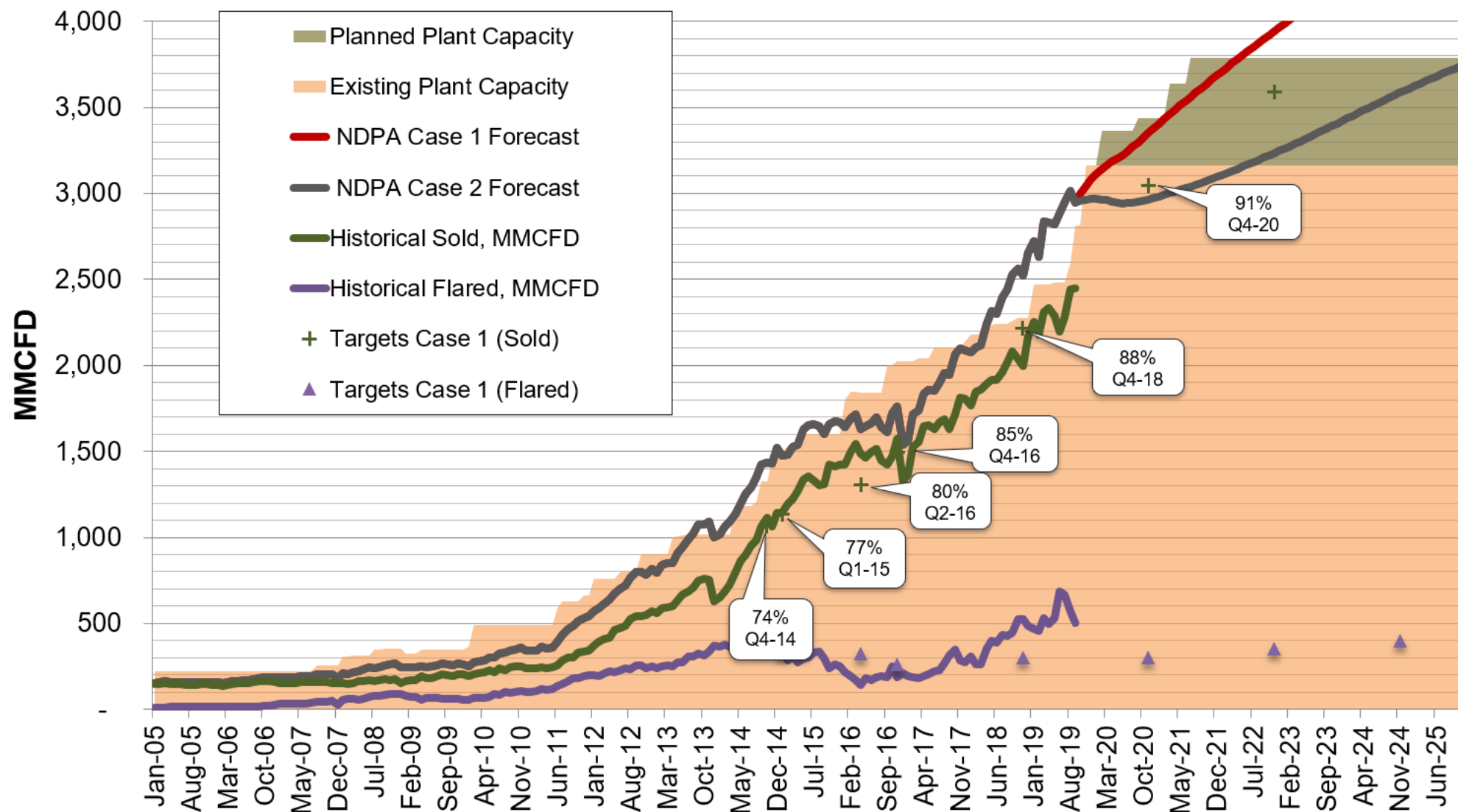
<b>Plant Name</b>	<b>Plant Operator</b>	<b>County</b>	<b>Additional Expansion Vol., MMCFD</b>	<b>Estimated In-Service Date</b>
Demicks Lake II	ONEOK	McKenzie	200	20-Feb
Nesson	XTO	Williams	75	20-Sep
Bear Creek II	ONEOK	Dunn	200	21-Mar
Tioga	Hess	Williams	150	21-Jul

**625 MMCFD**



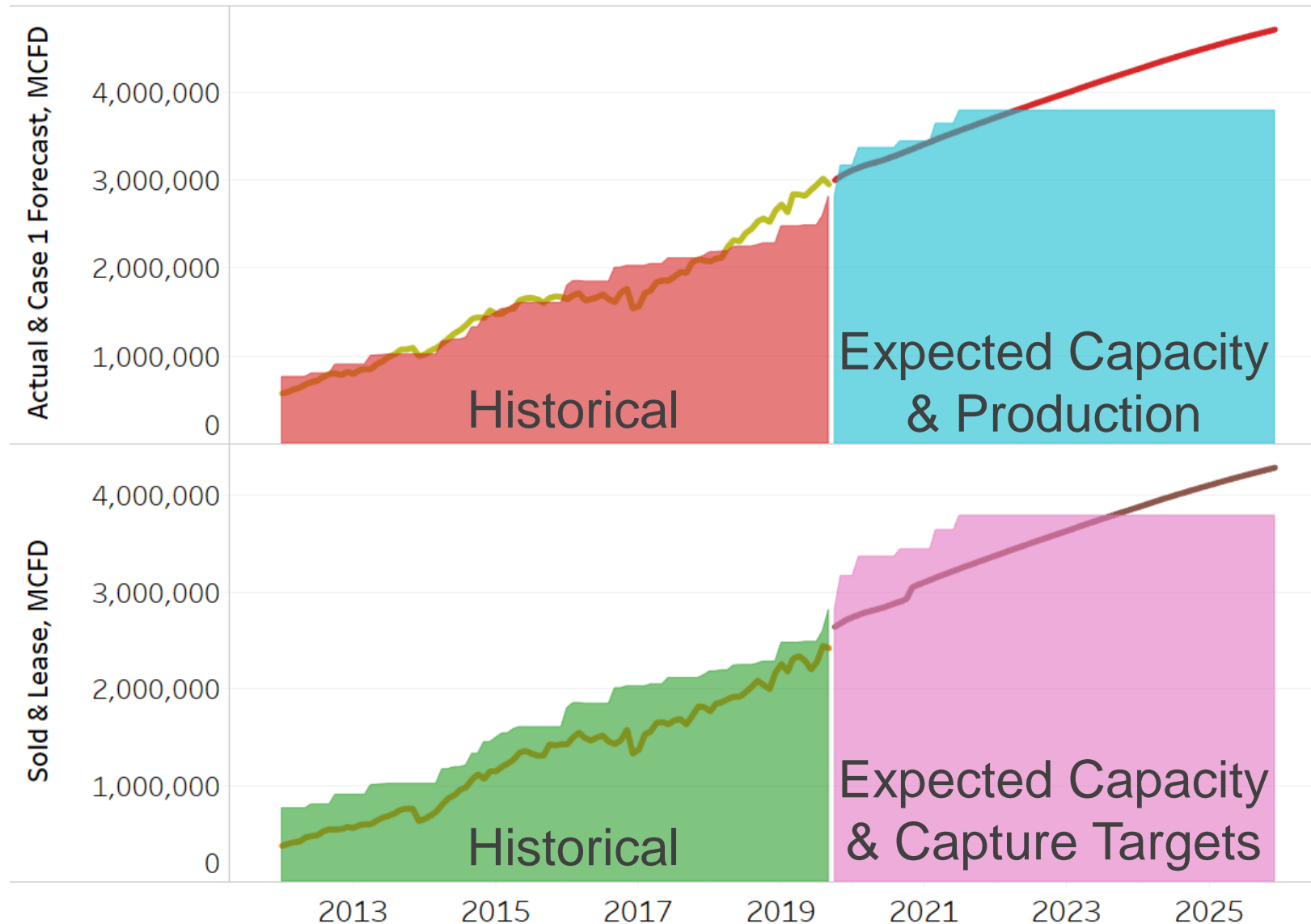
# Solving the Flaring Challenge

*Assumes Current Technology – Enhanced Oil Recovery Not Included*



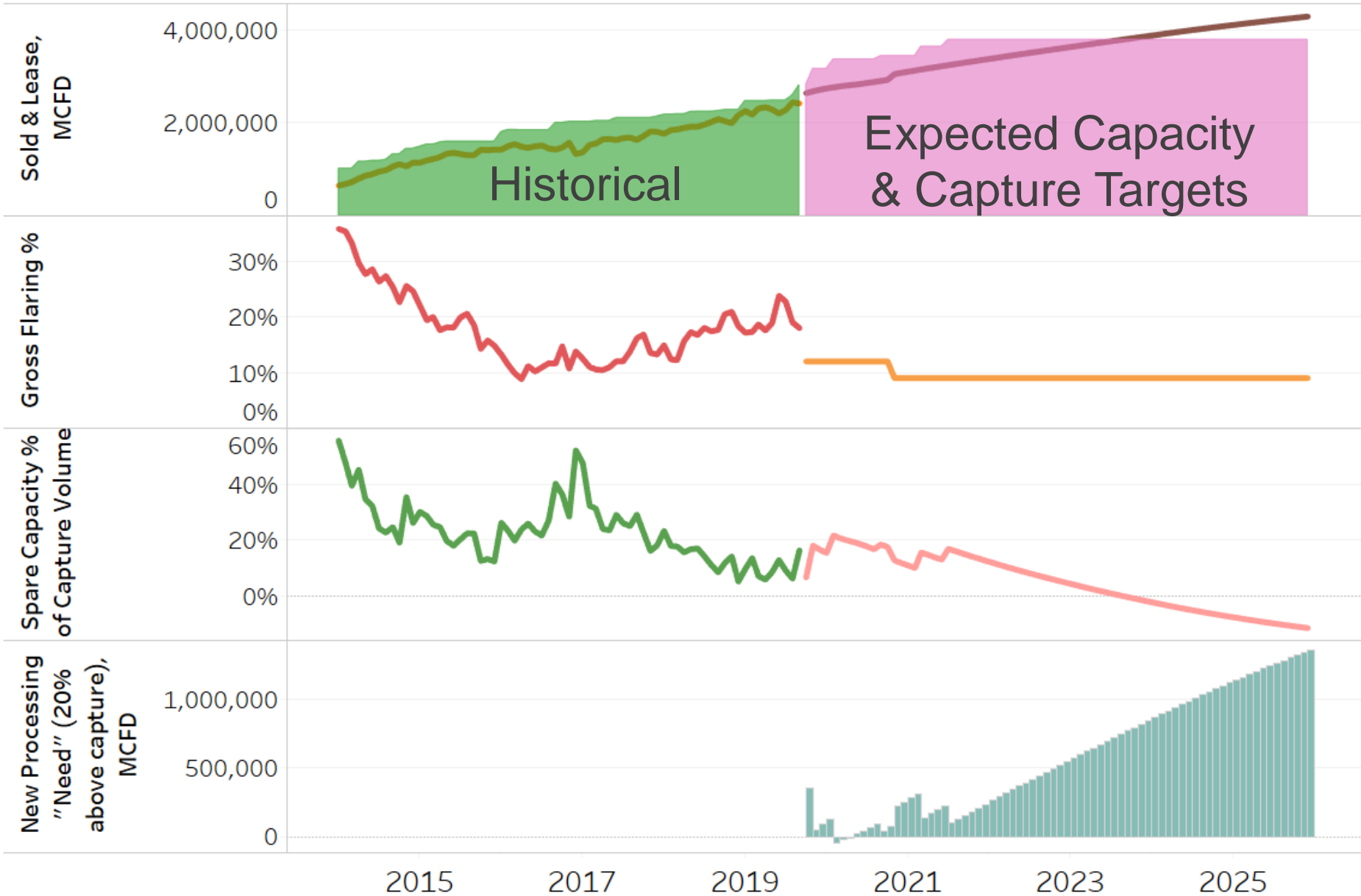
# Gas Processing Capacity & Future Outlook

*Assumes Current Technology – Enhanced Oil Recovery Not Included*

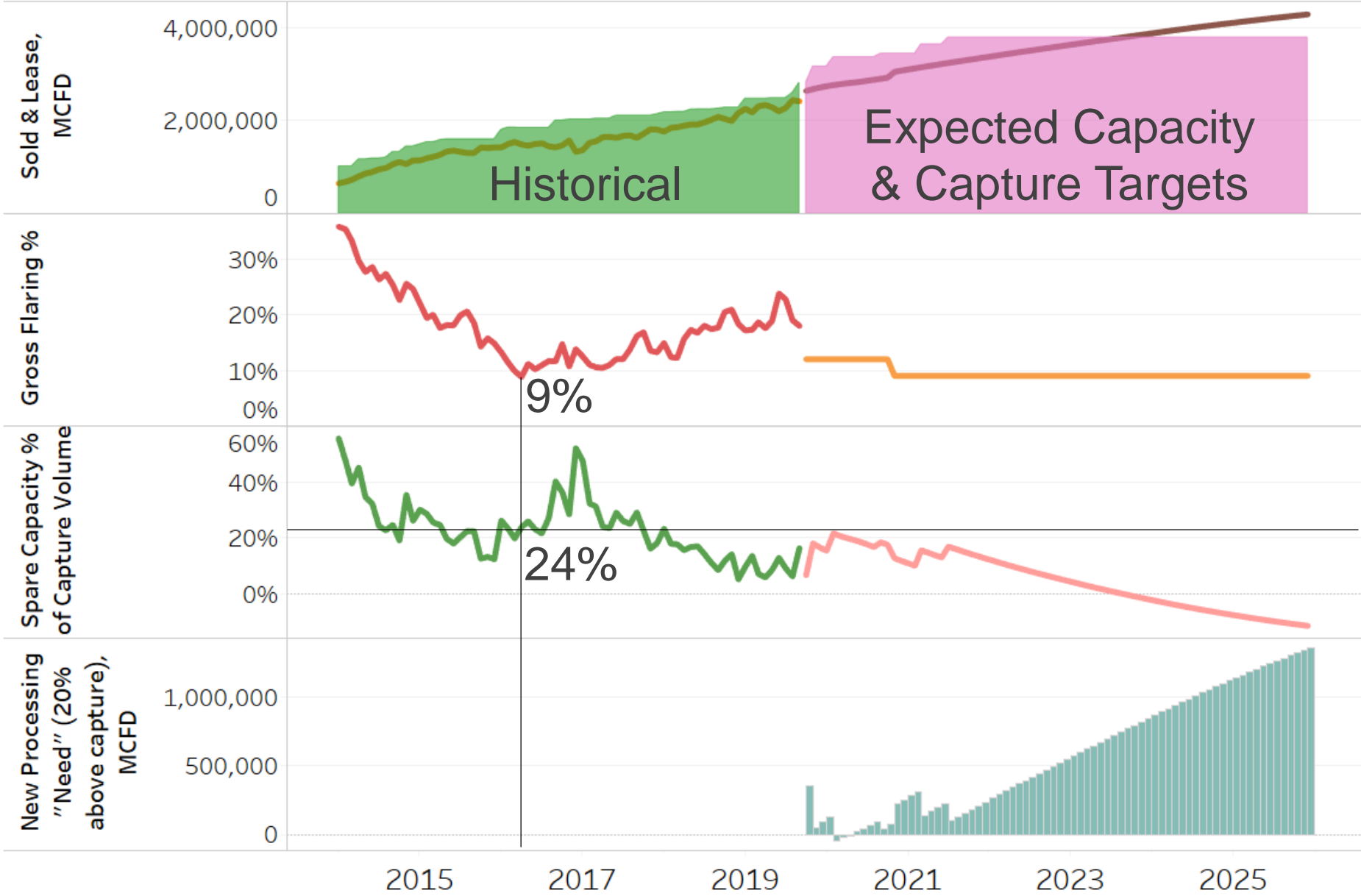




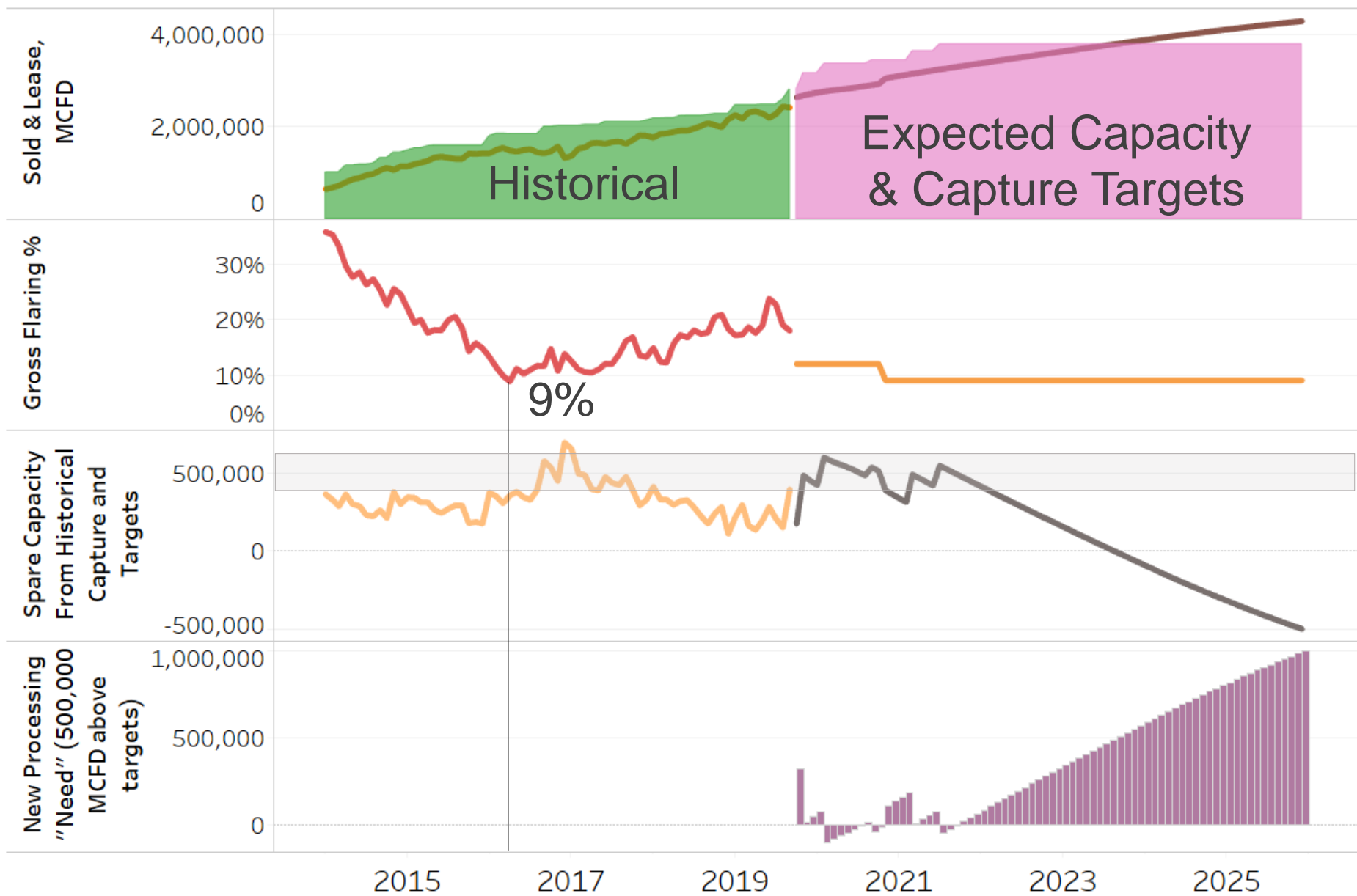
# Gas Processing Capacity & Spare Capacity



# Gas Processing Capacity & Spare Capacity

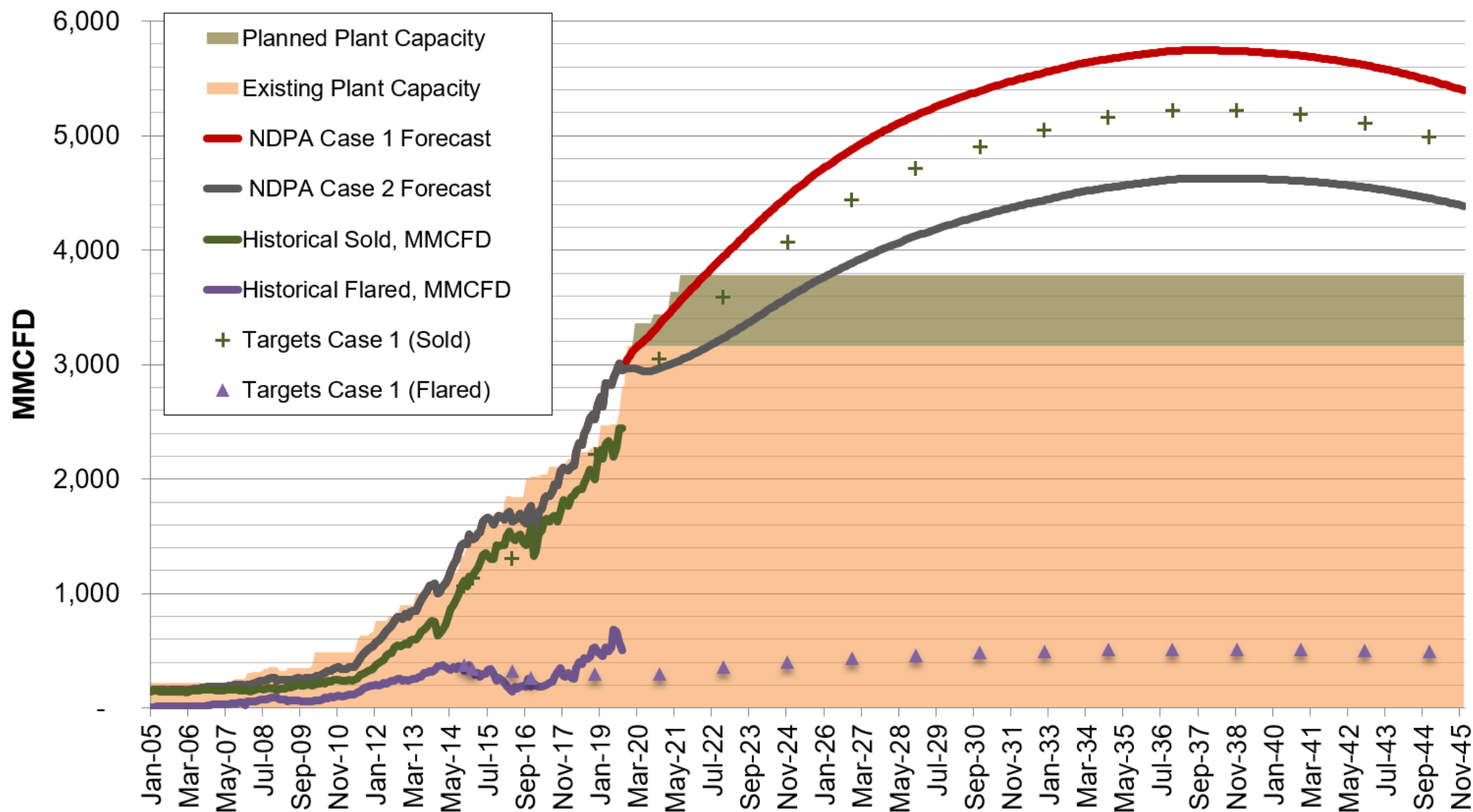


# Gas Processing Capacity & Spare Capacity

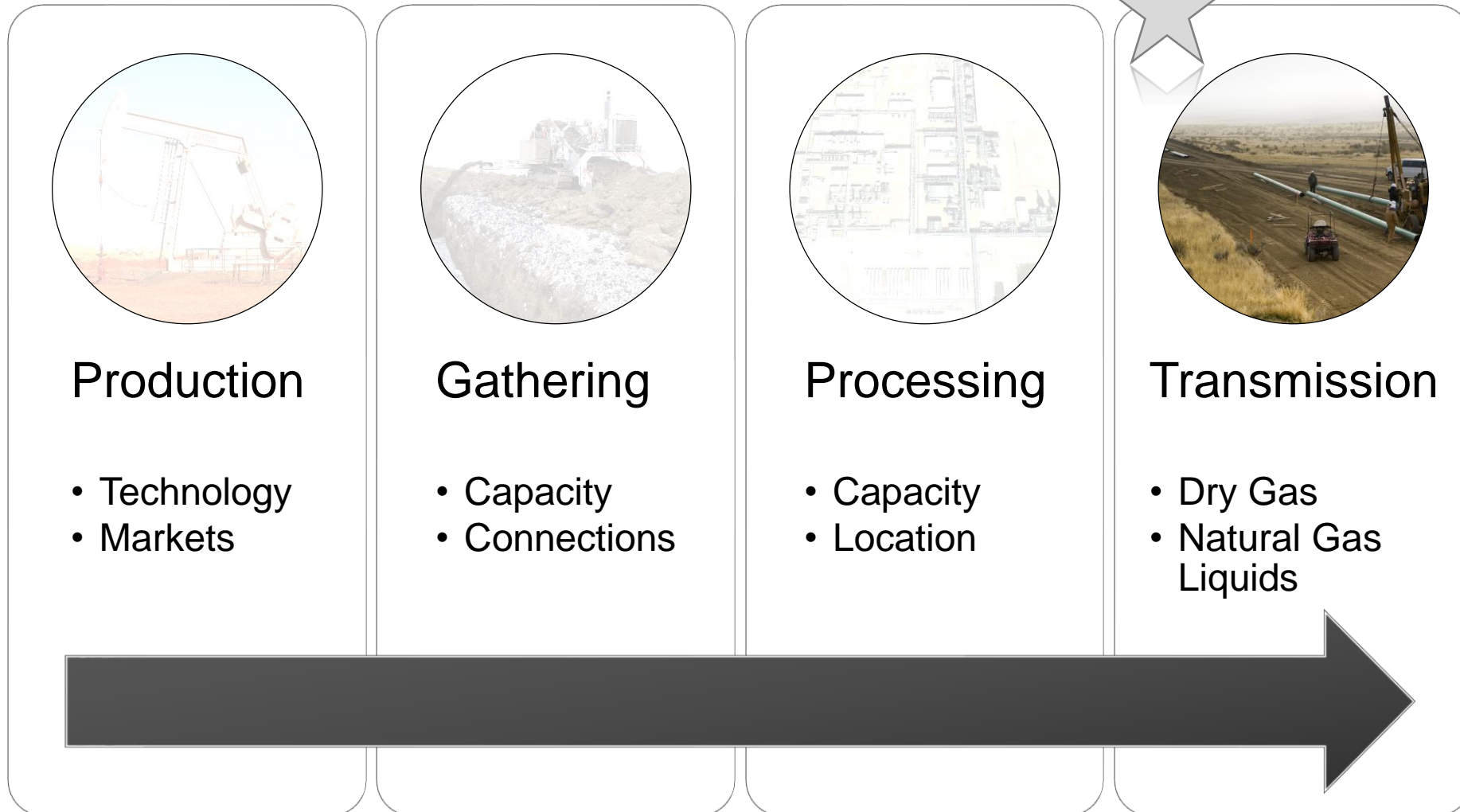


# Solving the Flaring Challenge

*Assumes Current Technology – Enhanced Oil Recovery Not Included*



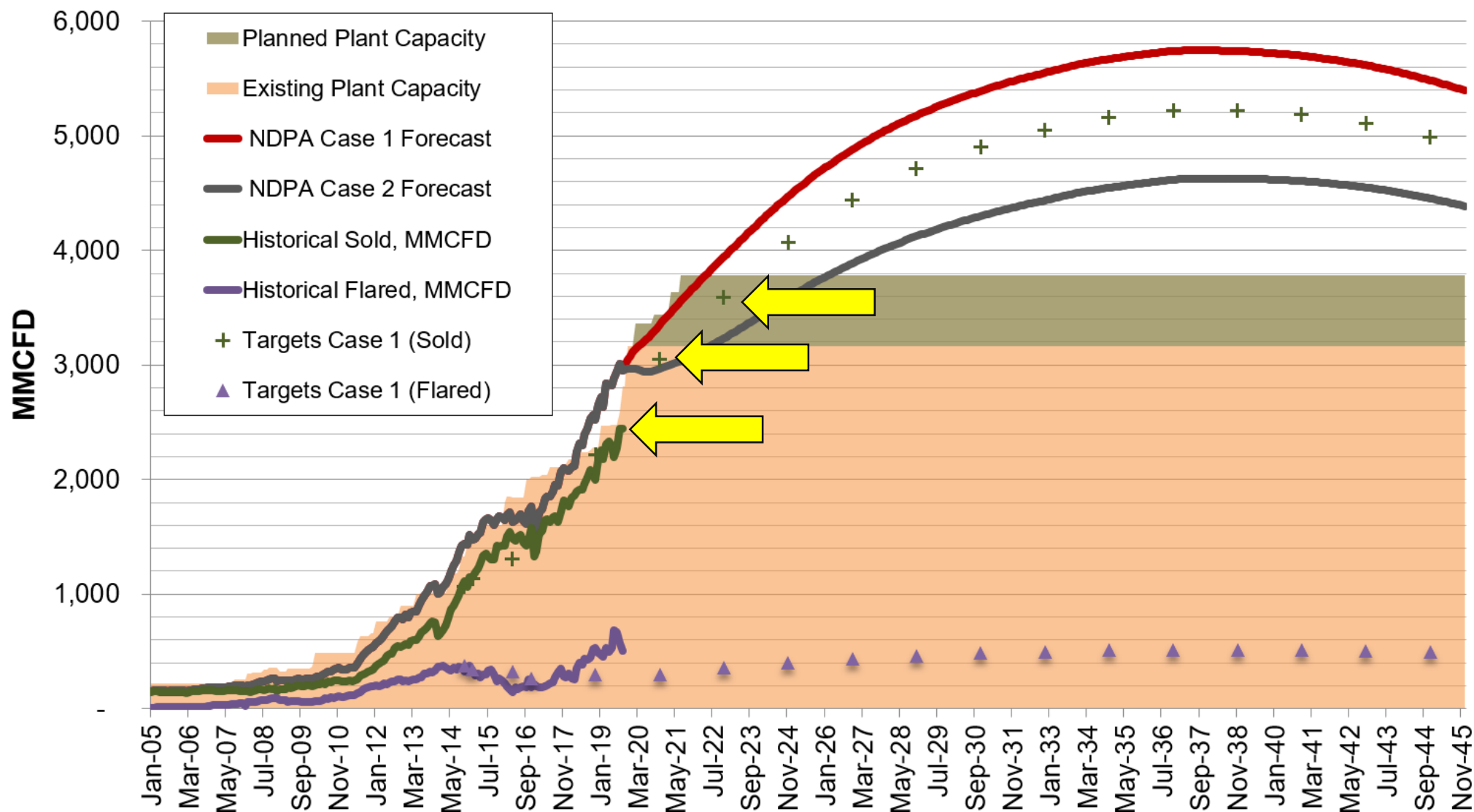
# Natural Gas Update



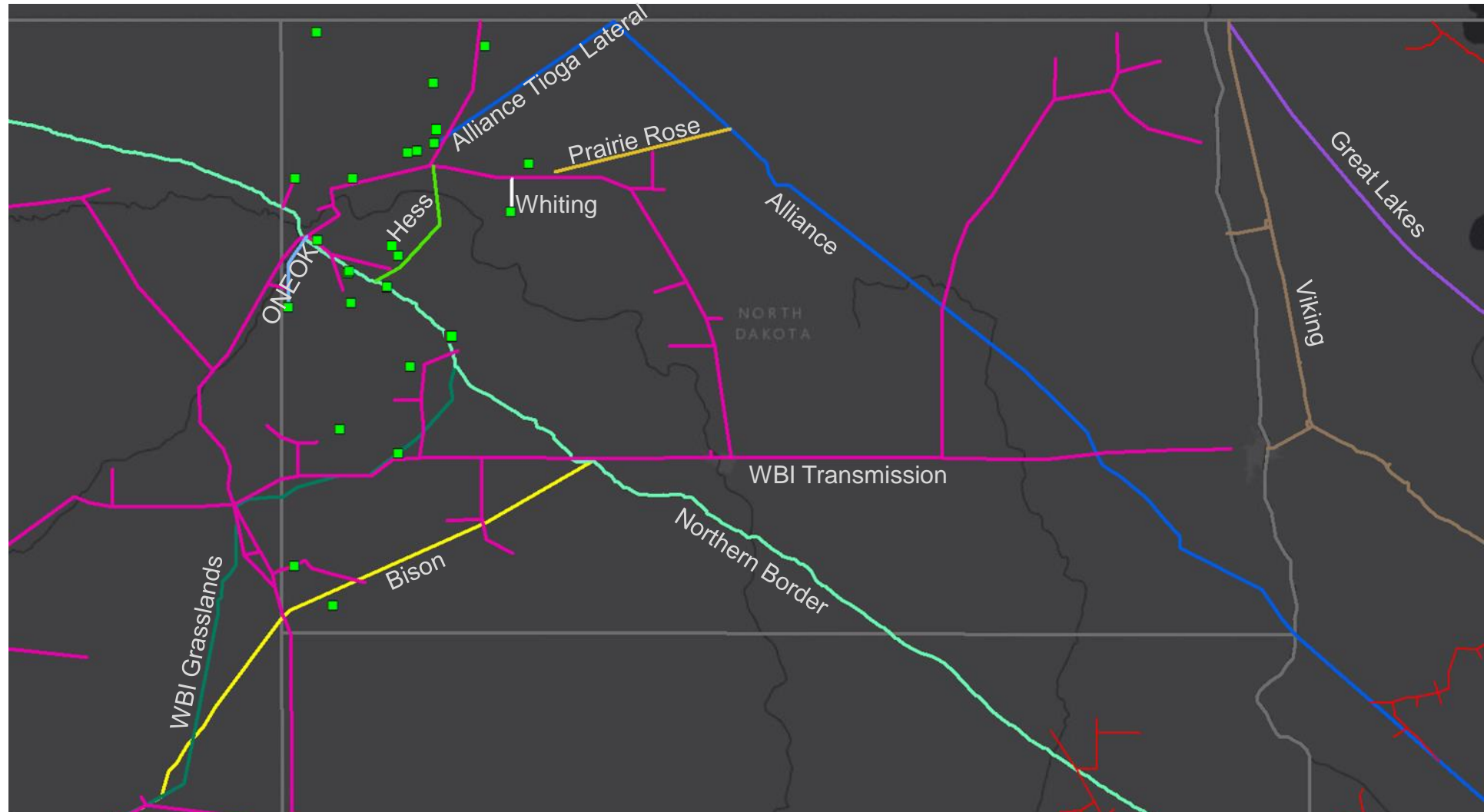


# Solving the Flaring Challenge

*Assumes Current Technology – Enhanced Oil Recovery Not Included*



# Major Gas Pipeline and Processing Infrastructure



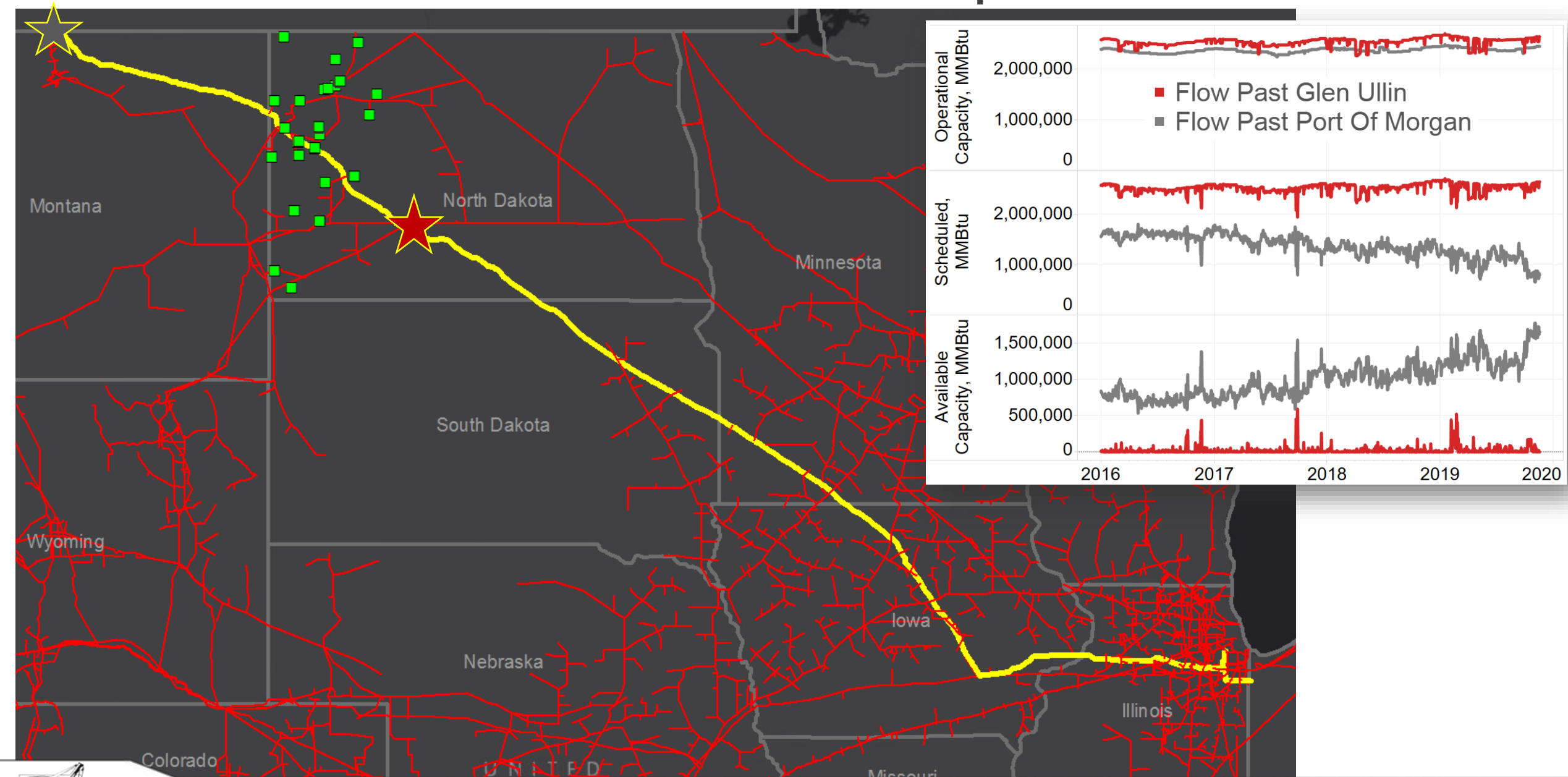
# WBI Energy – North Bakken Expansion Project

## Project Highlights

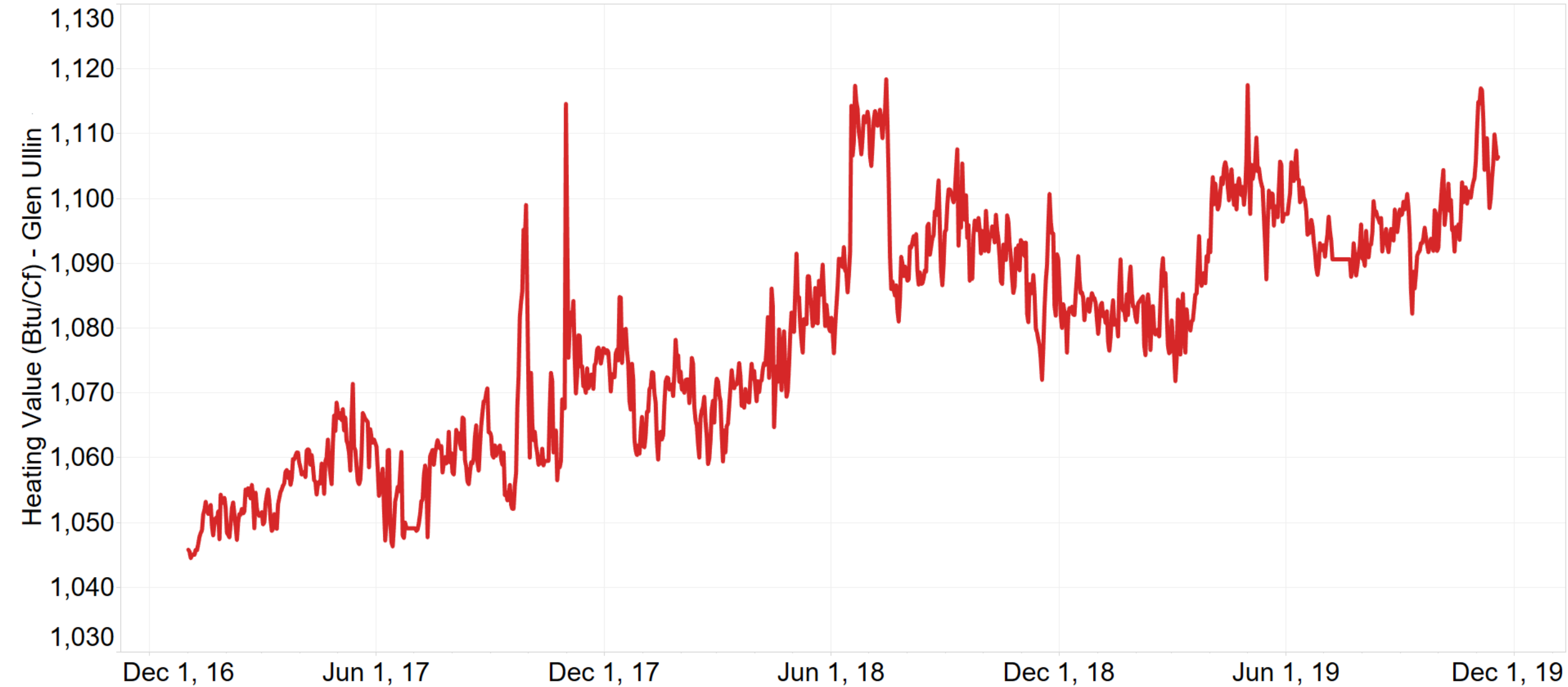
- 67 Miles - 20" Pipeline
- 20 Miles - 12" Pipeline
- \$220+ Million
- At least 250,000 MCFD Capacity (expandable)
- Expandable to 375,000 MCFD
- End of 2021 Proposed Completion
- Residue Gas Service From North of Lake Sakakawea to Northern Border Pipeline in McKenzie County



# Northern Border Pipeline

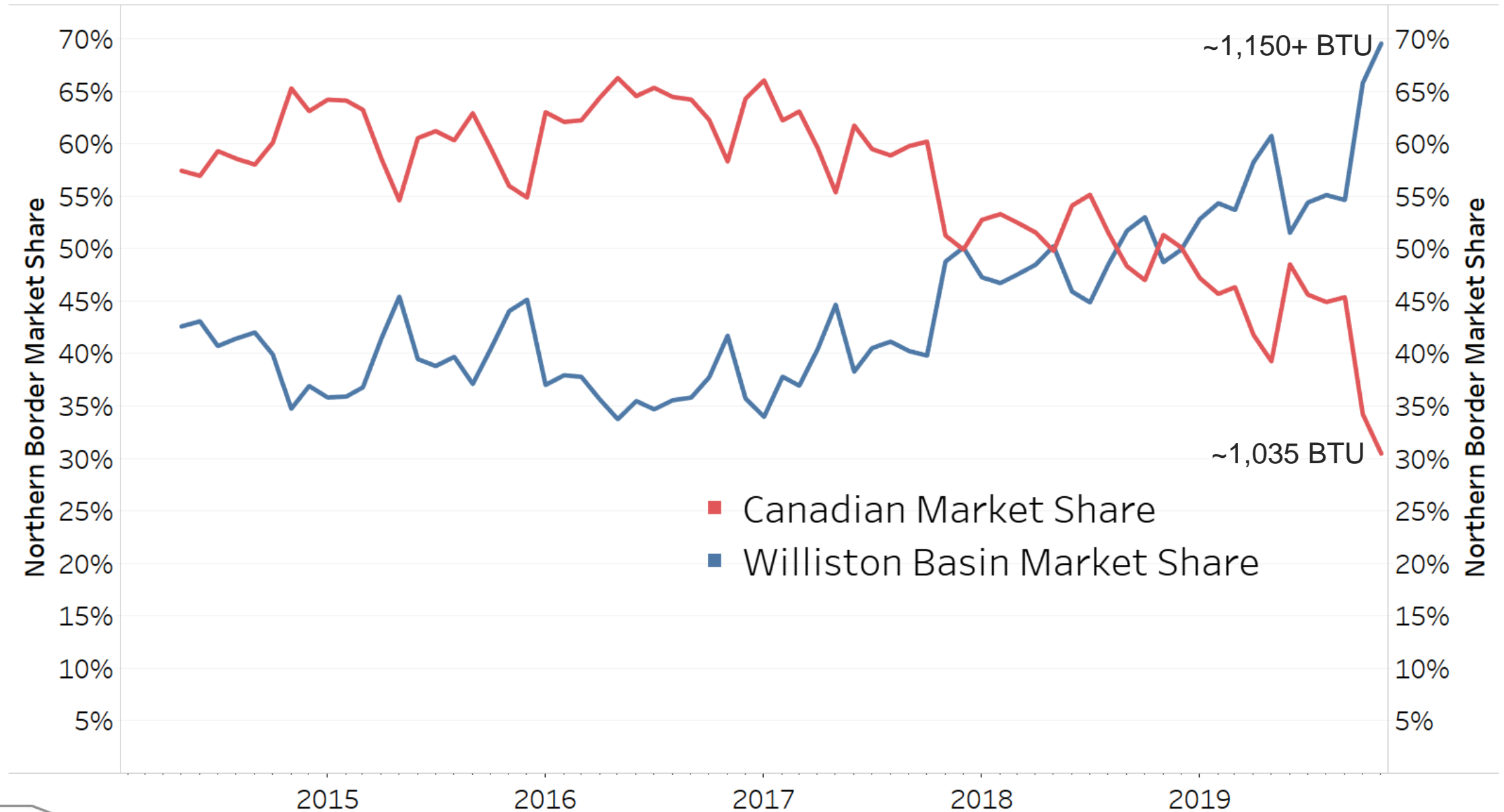


# Northern Border BTU at Glen Ullin, ND

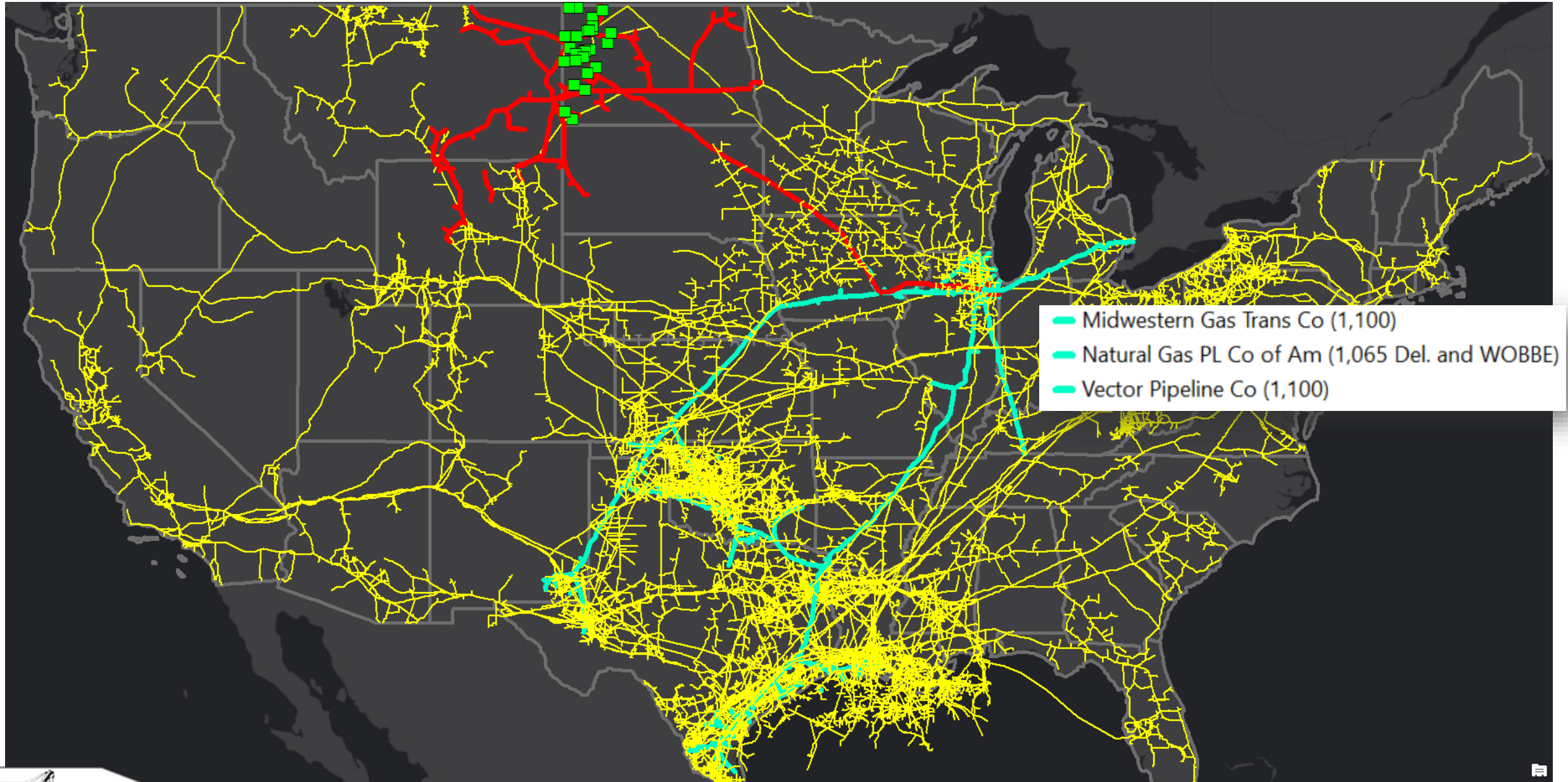




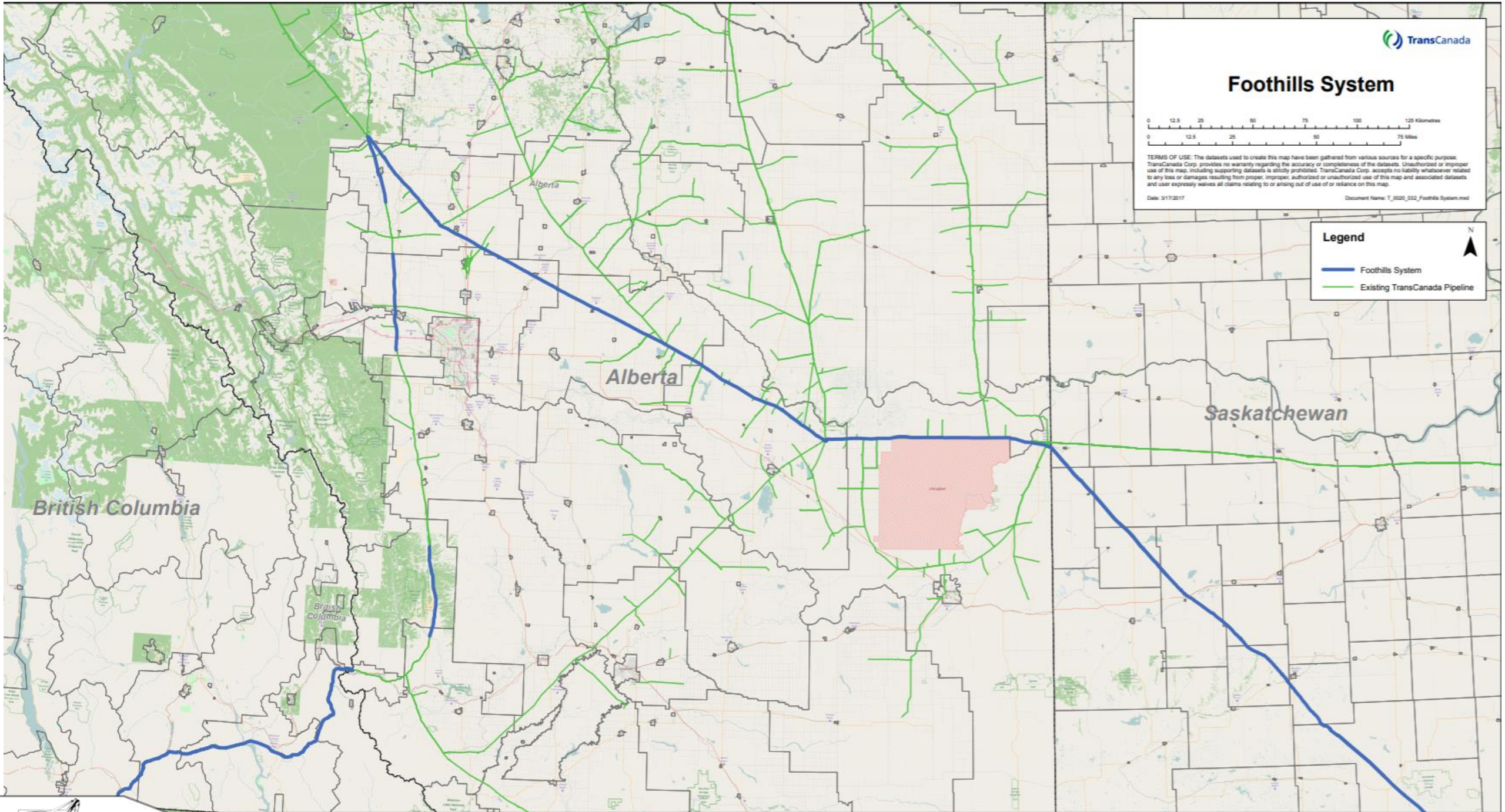
# Northern Border Pipeline Market Share



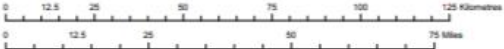
# NB Pipeline Interconnects With Known BTU Limits







# Foothills System



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Date: 3/17/2017

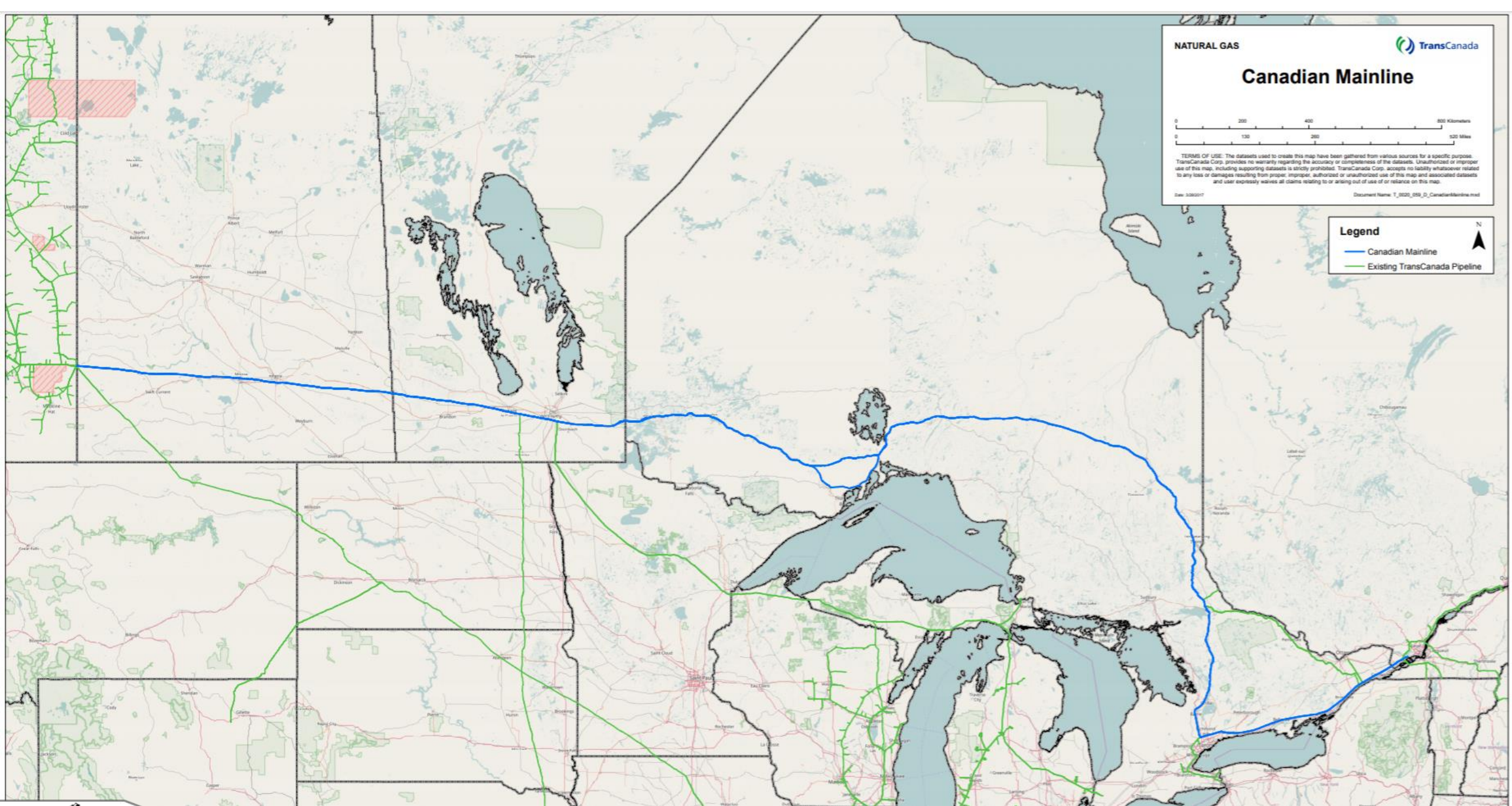
Document Name: T\_0020\_032\_Foothills System.mxd

## Legend

- Foothills System
- Existing TransCanada Pipeline







NATURAL GAS



## Canadian Mainline



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Date: 3/26/2017

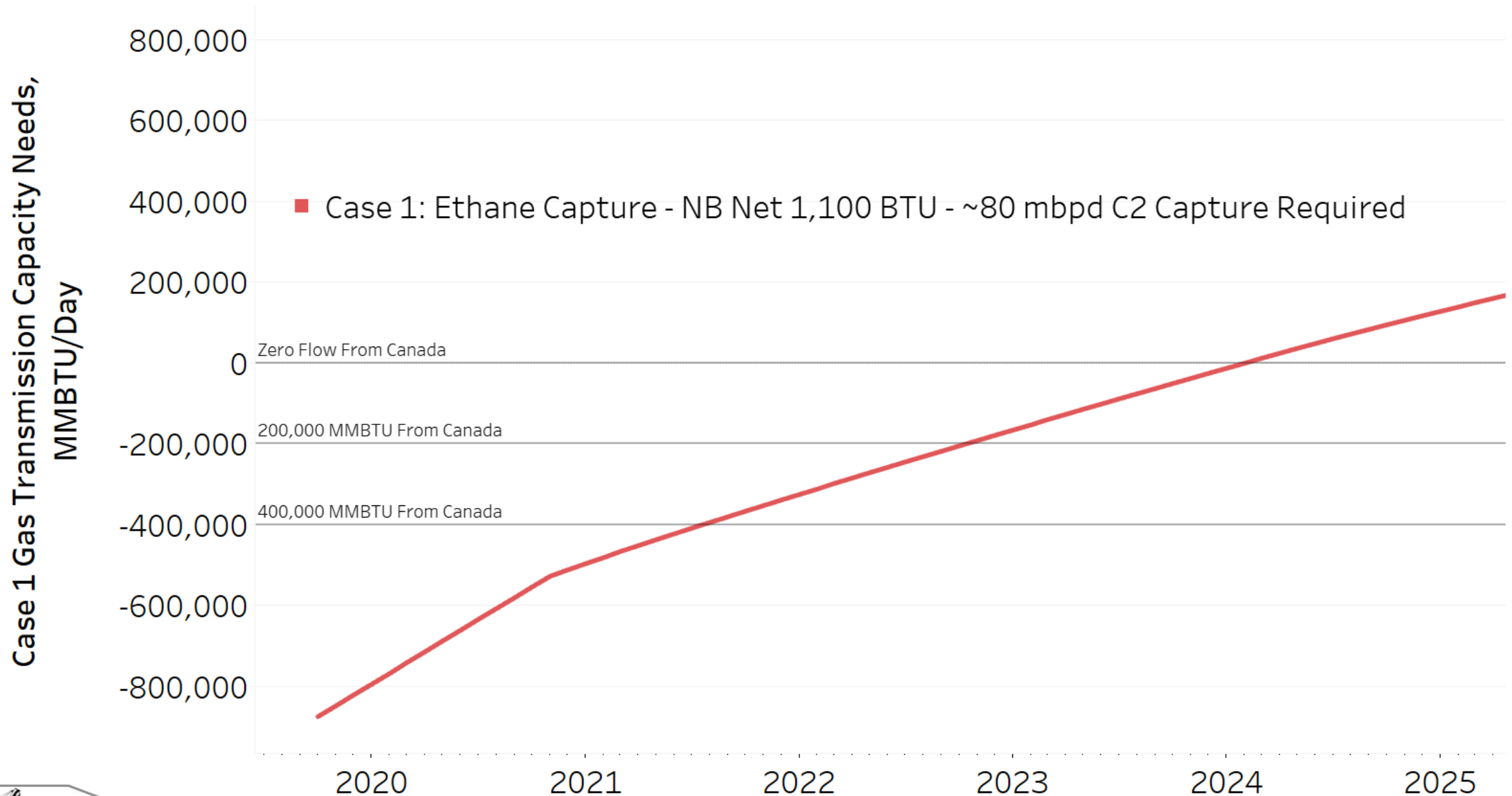
Document Name: T\_3020\_059\_0\_CanadianMainline.mxd

### Legend

- Canadian Mainline
- Existing TransCanada Pipeline

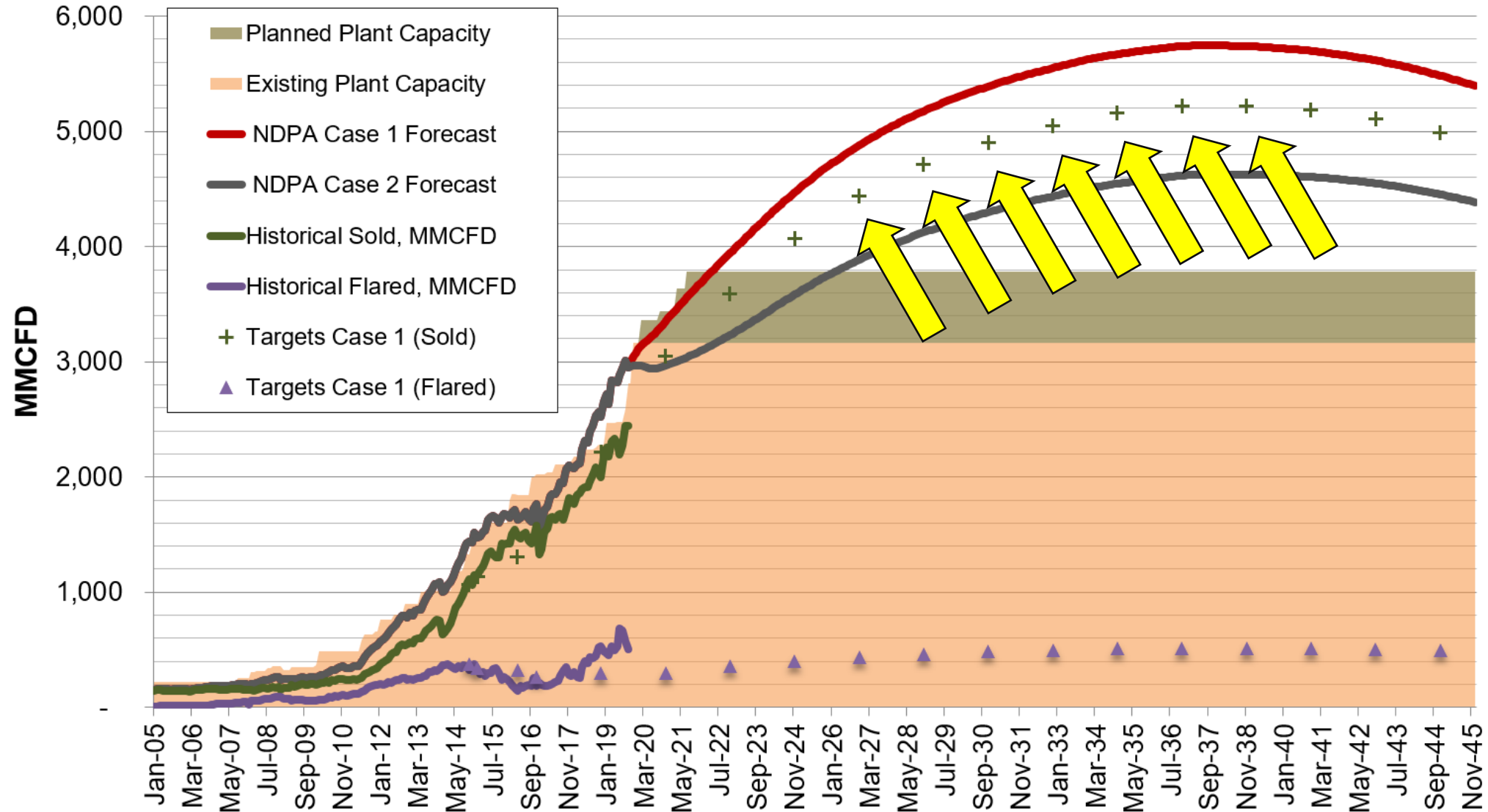


# Northern Border – BTU Calculations\*



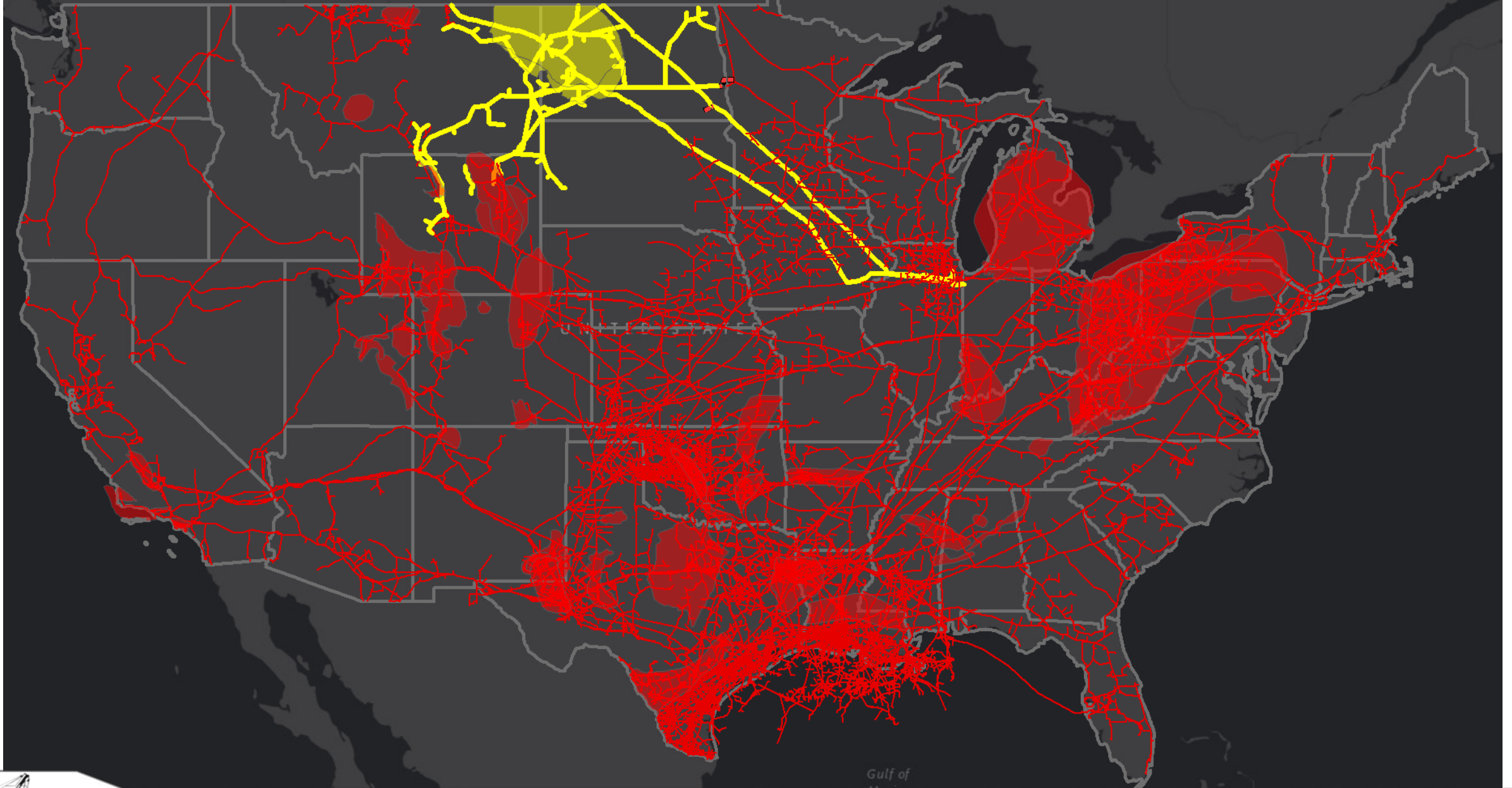
# Solving the Flaring Challenge

*Assumes Current Technology – Enhanced Oil Recovery Not Included*



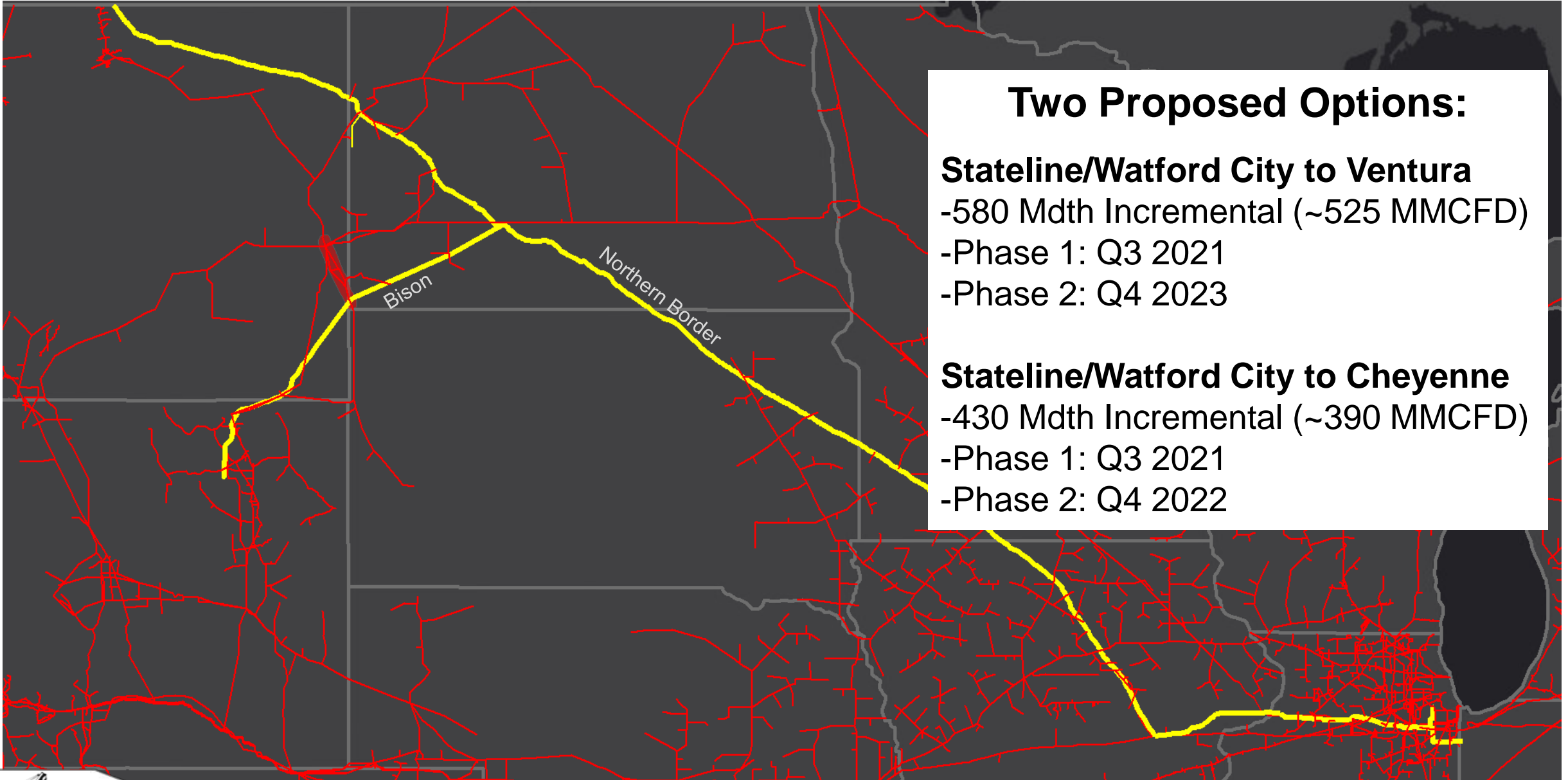


# Bakken Natural Gas Infrastructure

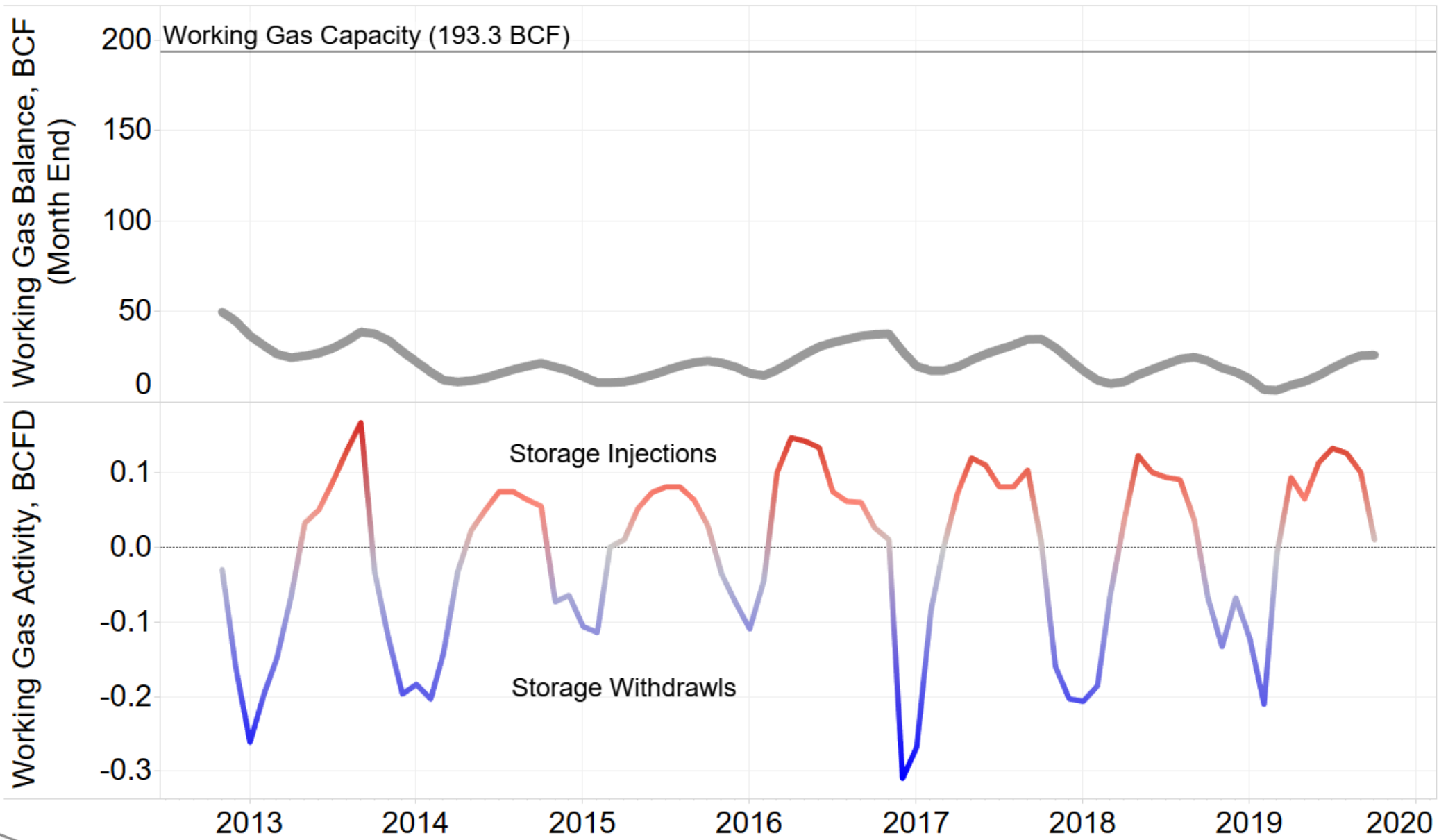




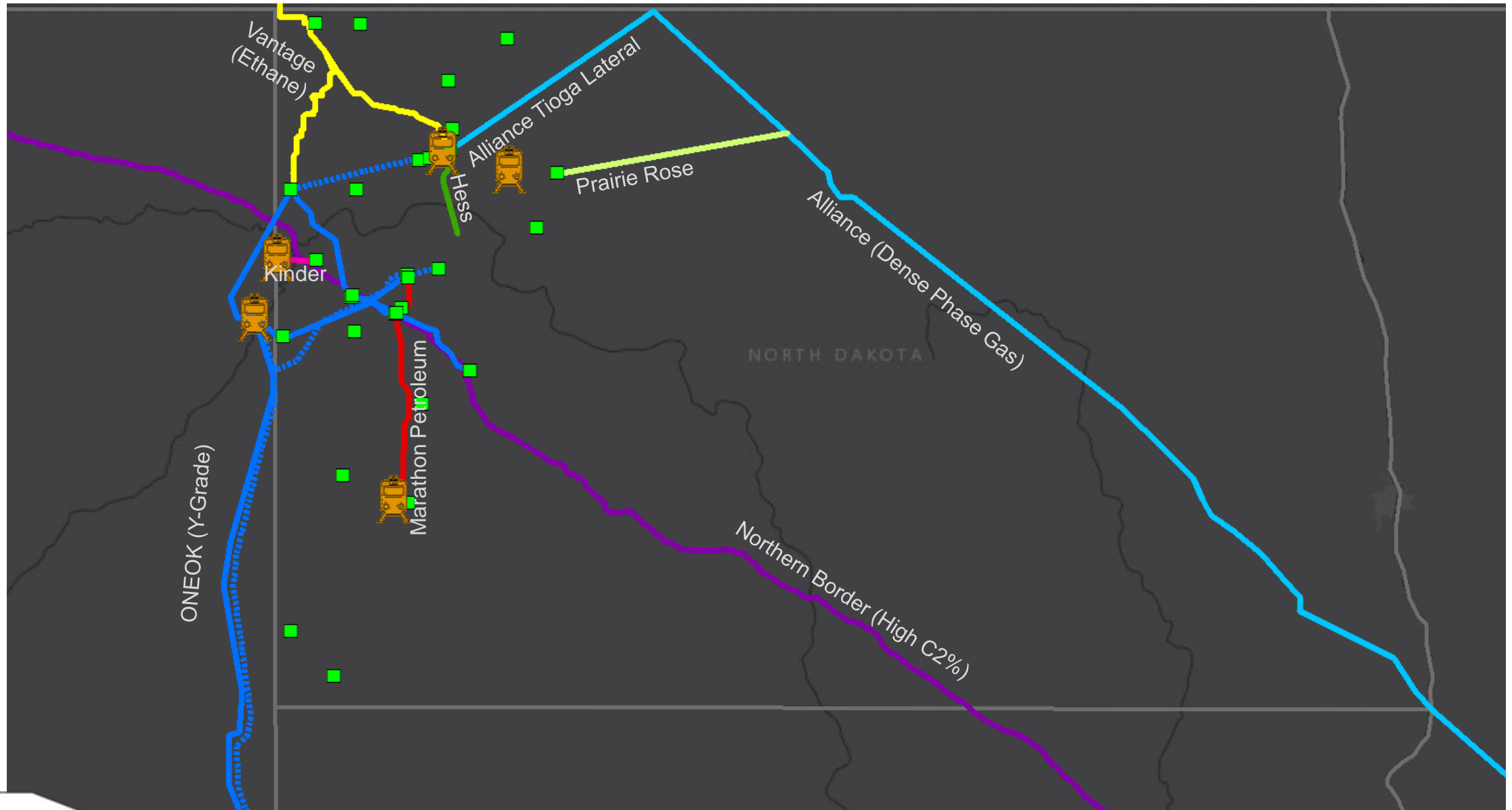
# Northern Border Proposed Expansion Options



# Residue Gas Storage Update – WBI Baker

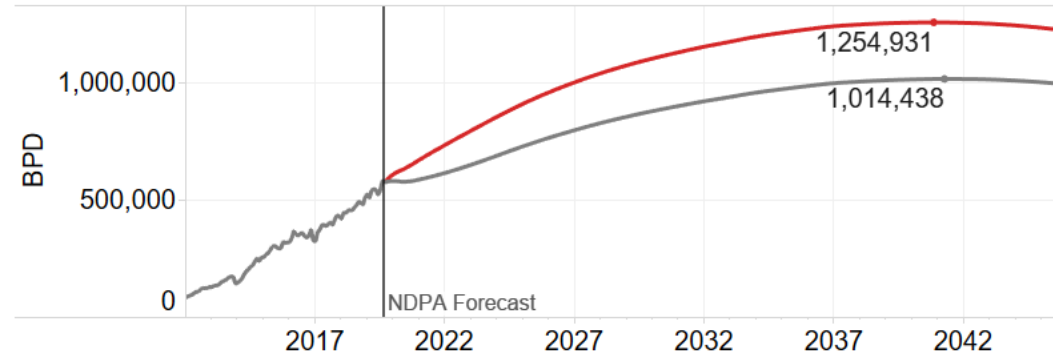


# Regional NGL Infrastructure

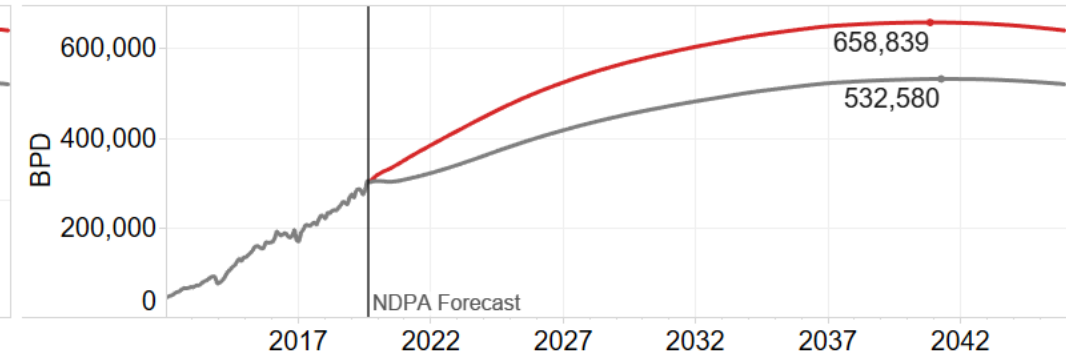


# North Dakota Captured\* NGL's

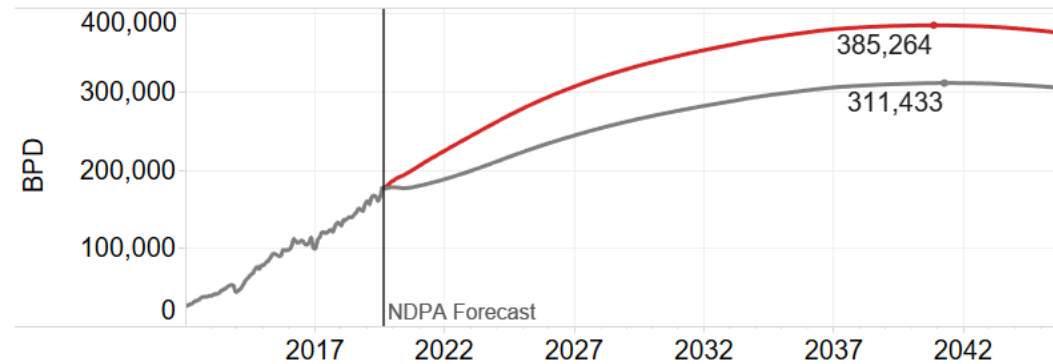
All Natural Gas Liquids



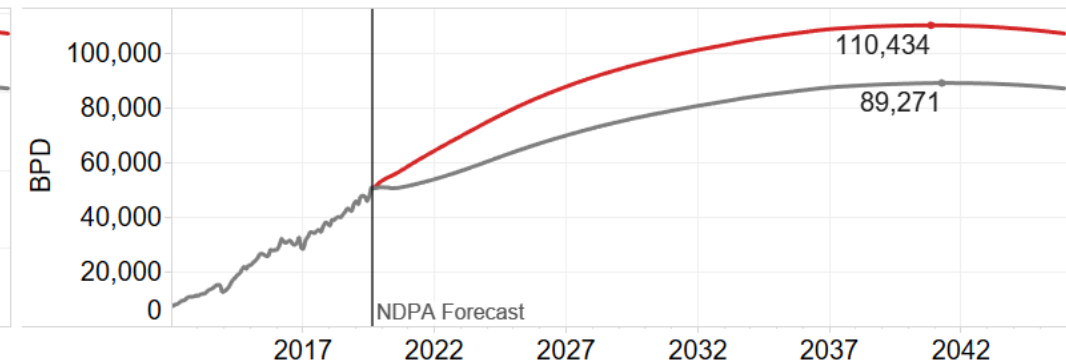
Ethane



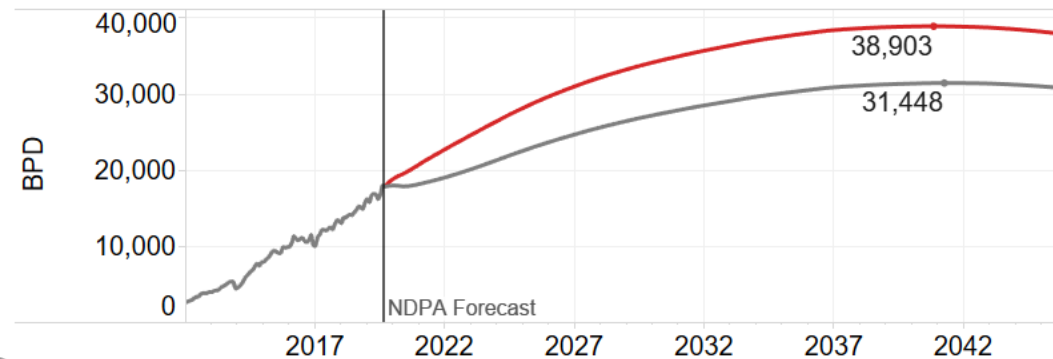
Propane



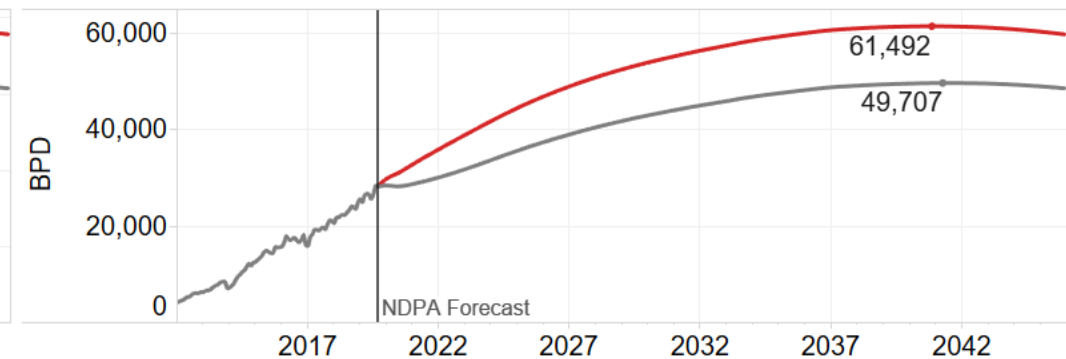
Butane



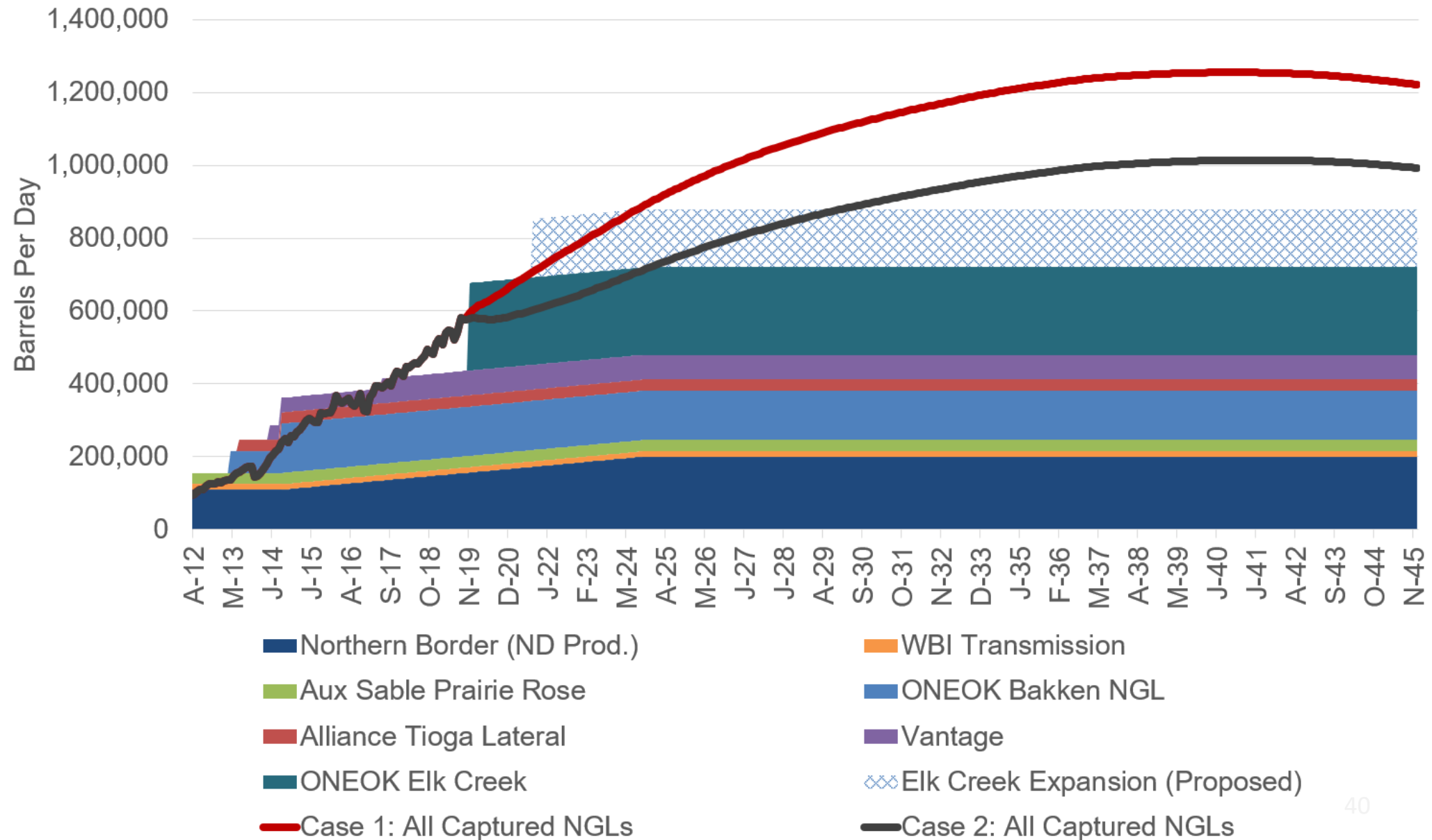
Isobutane



Natural Gasoline



# NGL Pipeline Takeaway Options



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# Contact Information

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Websites:

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