GETTING BAKKEN GAS TO MARKET

WHILE MAXIMIZING RESOURCE RECOVERY | MINIMIZING RISK | DECREASING EMISSIONS

A SOLUTION SET OVERVIEW

David Scobel, Chief Operating Officer | Caliber Midstream | May 20, 2015

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FLARING –
THE BAKKEN'S DIRTY WORD

Elephant in the Room:
~28% of all gas in the Bakken is flared,
THE "BIG FLARE"
(problem is improving, off peak of ~36%)

Little Known Fact:
3-5% of energy content vented from atmospheric tanks, **THE "LITTLE FLARE"**
(problem has barely been addressed)

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WHAT'S WRONG WITH THIS PICTURE?

THE PROBLEM WITH THE LITTLE FLARE

- Does not maximize monetization of high-BTU gases
- Increased emissions
- IPs greater than 8,000 bopd necessitate crude vapor capture or a PSD permit
- Safety concerns if the flare blows out

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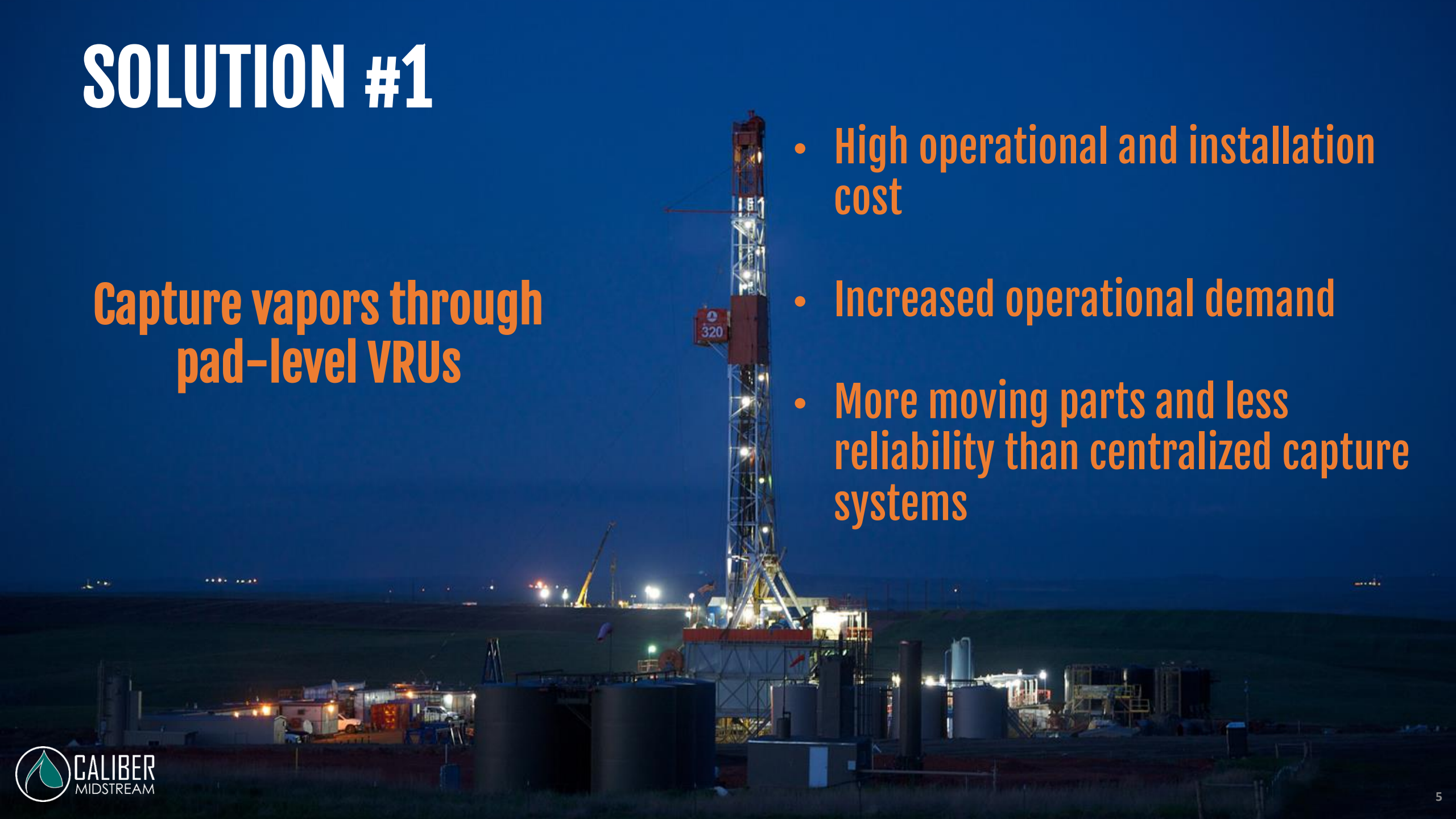
SOLUTION #1



Capture vapors through pad-level VRUs

- High operational and installation cost
- Increased operational demand
- More moving parts and less reliability than centralized capture systems

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SOLUTION #2

High vapor pressure gathering of “live crude oil”

- A pressure vessel at each well pad allows producers to bypass atmospheric crude oil tanks at the wellhead
- Eliminates the “little flare”
- Centralized crude oil processing
- 100% crude oil vapor recovery
- System can be integrated into existing production or greenfield projects

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EVOLVING REGULATORY RISK

Order No. 25417 (State of North Dakota), effective February 1, 2015

- 13.7 RVP

US Dot / Transport Canada / Crude-by-Rail Safety Act (Congress)

- No DOT-111 tank cars (removal of 37,700 cars)
- More advanced braking system (restricted to 30 mph if not installed by 2021)
- 9/16 inch tank shell requirement
- 40 mph speed limit through heavily populated areas

NDIC Gas Capture Rules

THE ANSWER: High Vapor Pressure Live Crude Gathering

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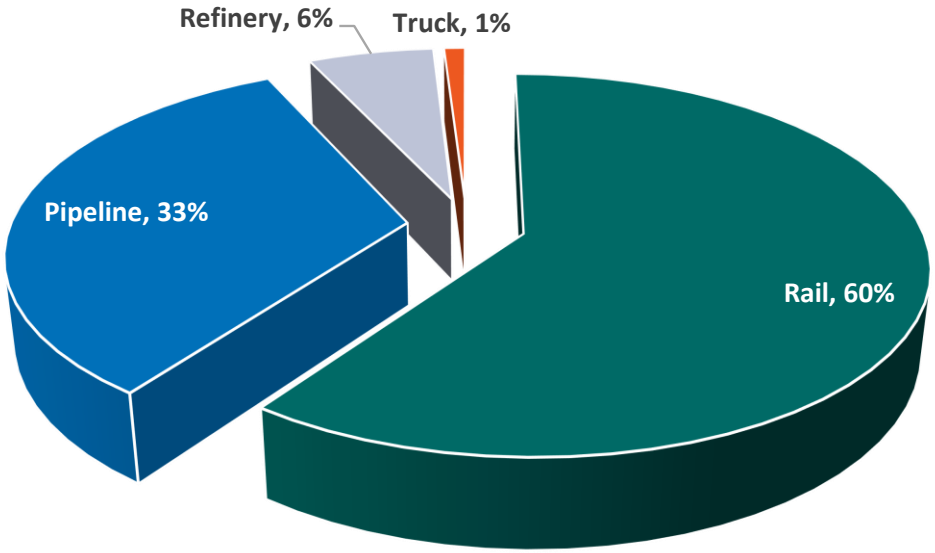
HOW CRUDE LEAVES THE BAKKEN



Yet another rail incident – what happens then…?

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IMPACT

Shut-in

Significant short-term shut-in potential if producers cannot meet RVP requirement

Tank Car Shortages

Regulations would precipitate tank care shortages; market turmoil

Cost Increases

Slower rail speeds translate to fewer turns, more storage infrastructure

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SOLUTION

STABILIZE CRUDE BELOW 13.7 RVP

- Consistent stabilization avoids potential disruption; safer, revenue uplift
- Product can be safely shipped or stored, depending on rail availability
- Shippers phase out older tank cars

OUR POSITION

Caliber does not believe that transporting Bakken crude oil is riskier than transporting product from other shale oil plays.

Regulations pose a risk to our industry, and private industry innovation is the answer to the threat of future regulations.

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THE BAKKEN IS BIG

2013, USGS: 7.4bn bbls of undiscovered, technically recoverable oil

2008, USGS: 3.0bn – 4.3bn bbls

- Installation of gas lines began taking place in 2008
- In 2015, many lines are undersized (understandably so); has been addressed by looping
- A new well connect isn't a cure-all; new gas comes on at higher IP rates and pressures, eating capacity and knocking old gas off

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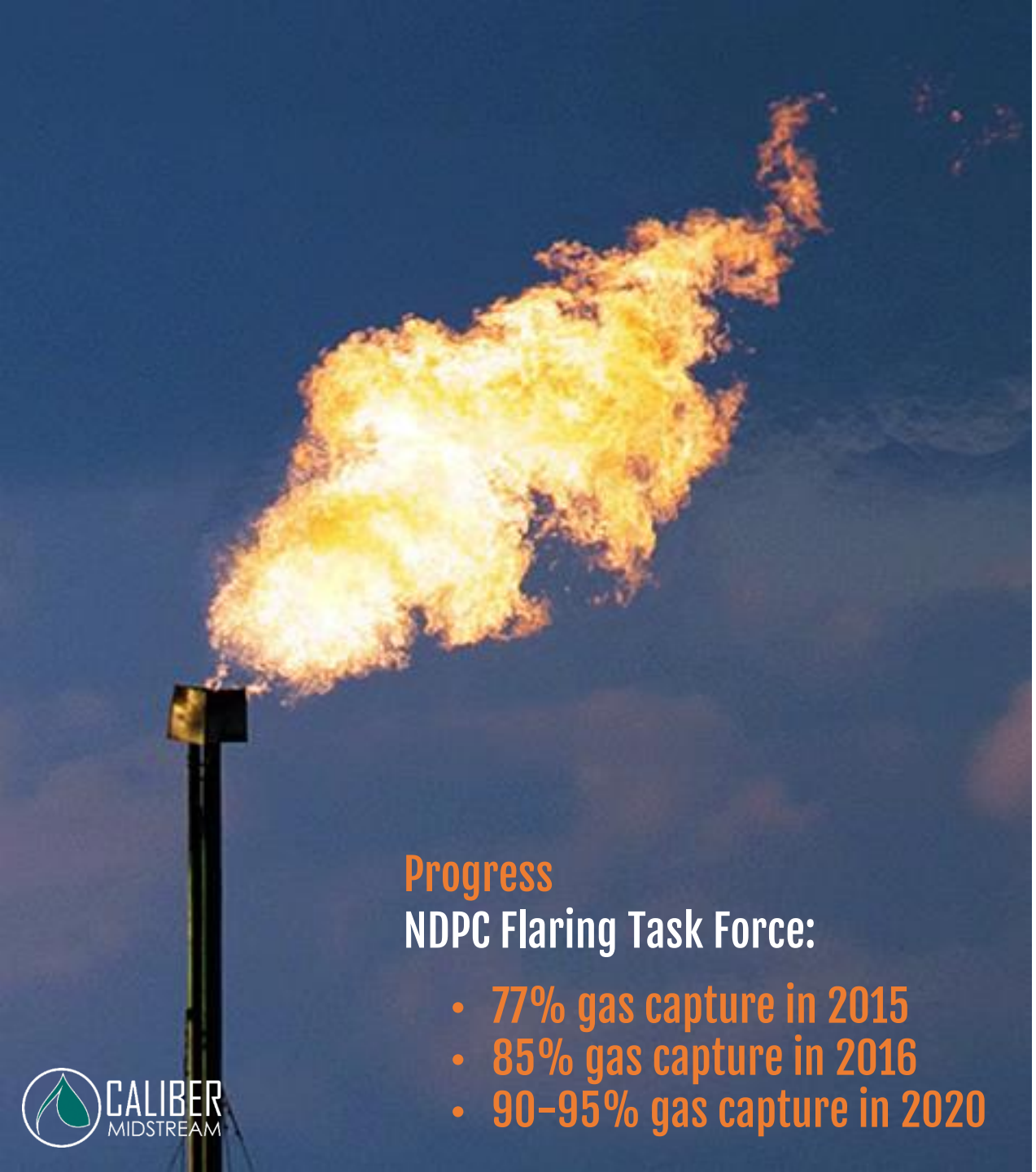
WHAT'S DRIVING DRILLING SCHEDULES POST DOWNTURN

~~High grading~~

Gathering and processing constraints



FLARING AND EMISSIONS

Flaring regulations in North Dakota:

- Gas capture plans must be filed with Approval to Drill (APD)
- Flaring must stop one year from date of well's IP
- Landowners may request revenue lost due to flaring
- Restrictions on pad emissions

IMPACT

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DELAYS
APD must have gas capture plans

SHUT-IN
If gas not connected to pipeline, well will be shut-in

ROYALTY COSTS
Payments for lost revenue

MORE COSTS
Additional infrastructure to recover tank vapors

A NEW SET OF BAKKEN ENTREPRENEURS

Capitalizing on temporary solutions:

- Pad-level refrig. and JT skids
- CNG
- LNG

Expensive, short-term, short-lived, safety concerns

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EXPAND GATHERING AND PROCESSING SYSTEMS

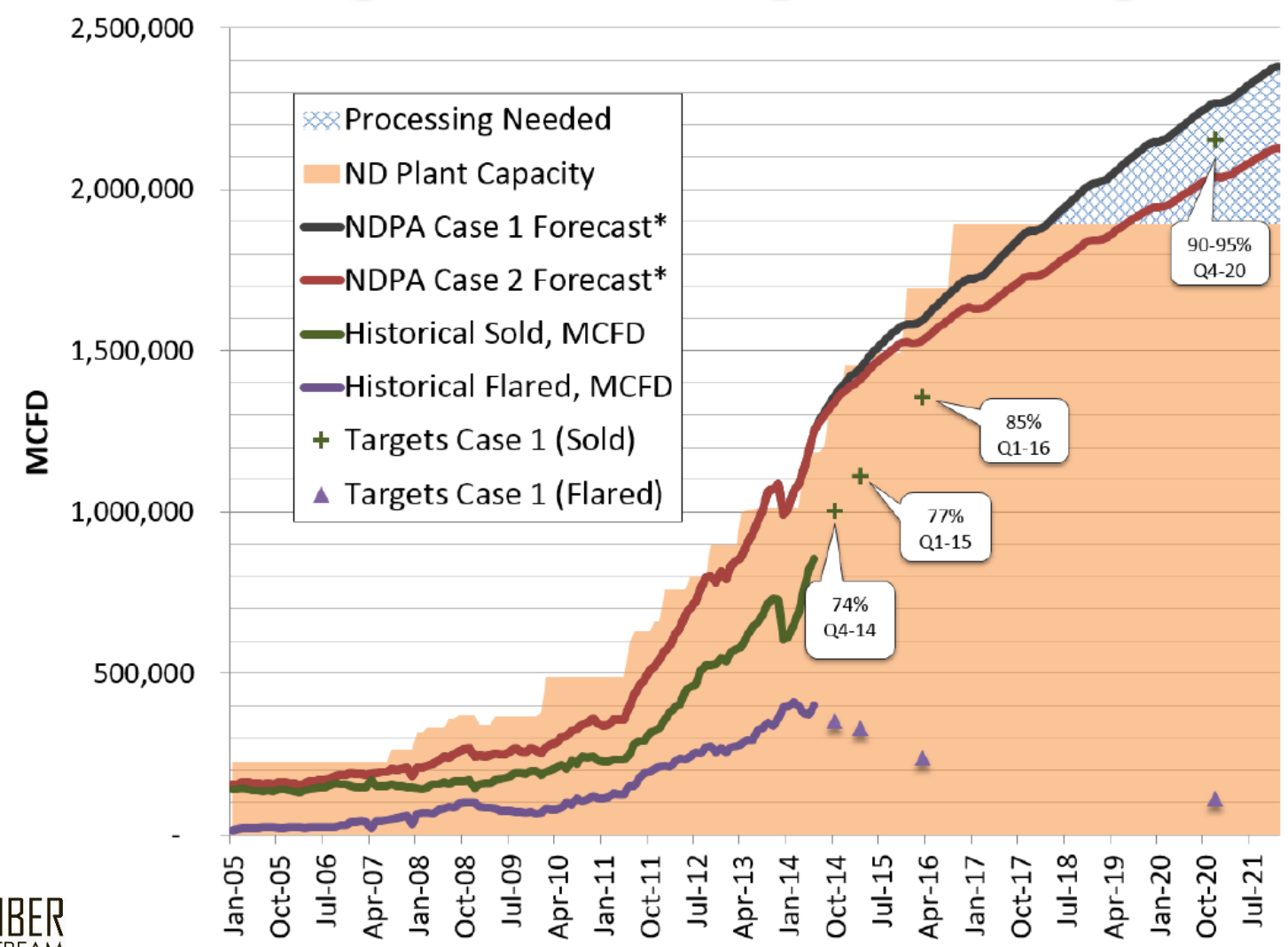
Larger pipes and upsized facilities

Support additional gas capture
Monetize gas lost through flaring

Midstream must innovate

Capture and monetize high BTU tank vapors
Build centralized stabilization

MARKET OVERVIEW FOR PROCESSING AND TAKEAWAY



How does future estimated gas capture affect the need for additional plant capacity?

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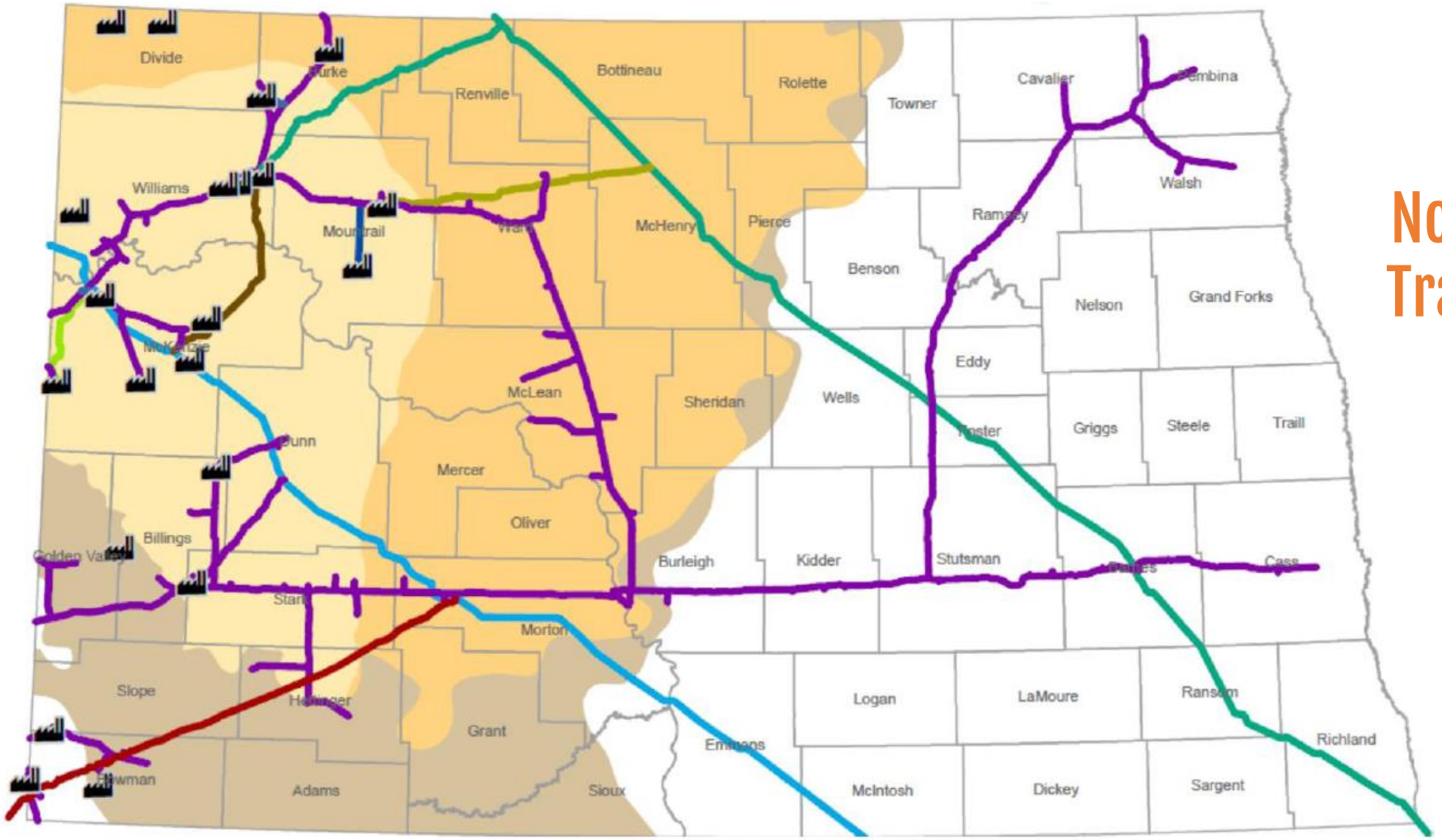
Source: North Dakota Pipeline Authority

MARKET OVERVIEW FOR PROCESSING AND TAKEAWAY *(Cont'd)*

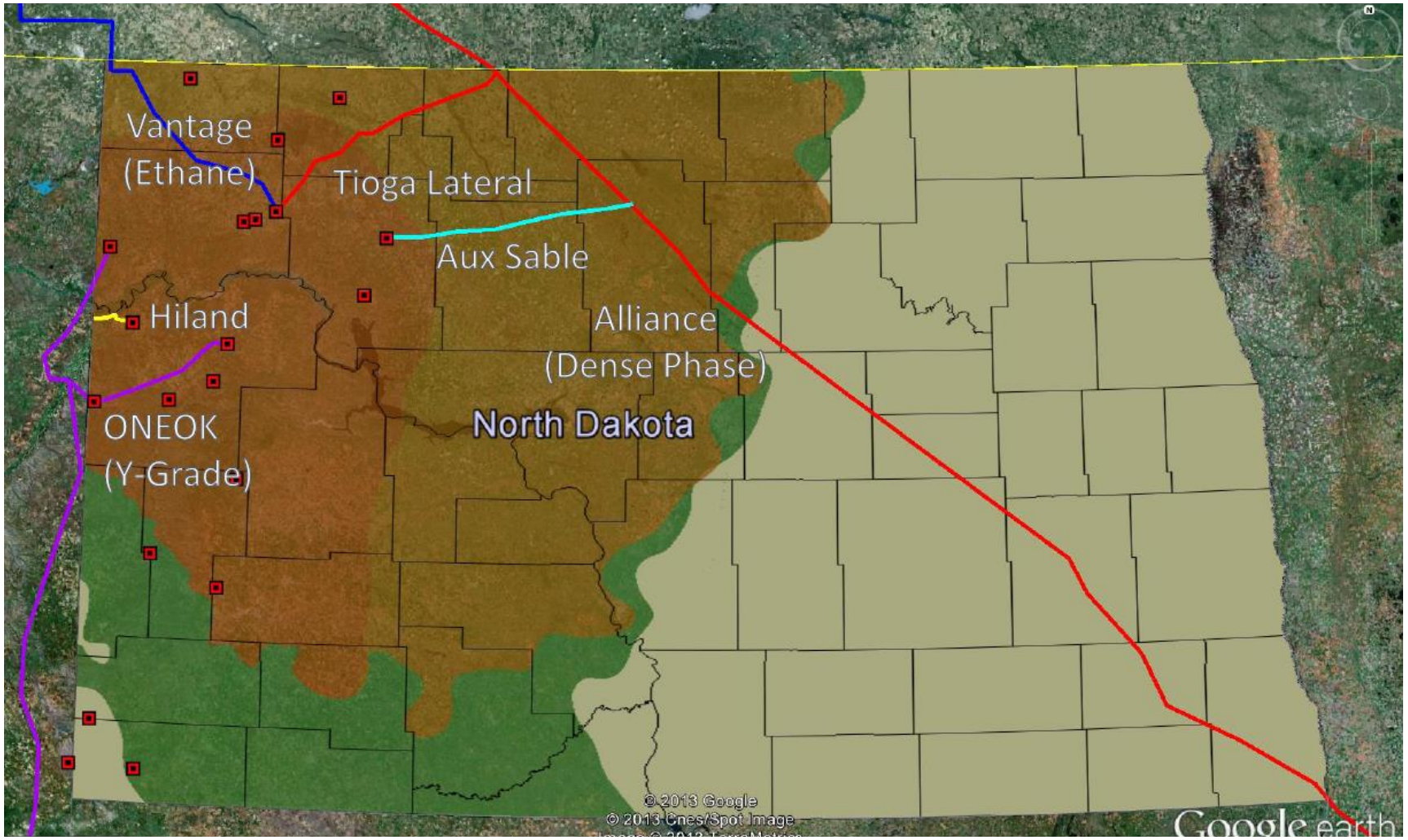


North Dakota Gas Transmission and Processing

Source: North Dakota Pipeline Authority

MARKET OVERVIEW FOR PROCESSING AND TAKEAWAY *(Cont'd)*

As increasing gas is captured, is NGL takeaway capacity the next crude oil takeaway capacity?



Source: North Dakota Pipeline Authority

ETHANE RECOVERY / REJECTION

- Bakken associated gas → high BTU → lots of ethane
  1. Separate from methane, used in petrochem feedstocks (polyethylene in *everything*)
  2. Burn as fuel
- Ethane prices have dropped and lag behind the prices of other NGLs

- What's better for the producer's netback? Recovery or rejection?

  Doesn't matter. Pipeline specs prevent plants from rejecting ethane (more favorable right now given pricing environment) → "walking the tightrope"

- What will improve this equation?
  1. Export ethane
  2. New ethane crackers


WE BELIEVE
Flaring regulations pose risk to our industry
Third party midstream service offers producers innovative solutions while raising profitability through economies of scale
Private industry innovation is the answer to the threat of future regulations
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THANK YOU

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