



GPAC O&M Conference

May 11, 2012

Outline of Presentation



- Ethane, Propane, Butane, Condensate Value
- Consumers of ethane in WCSB
- Sources of Ethane Supply in WCSB
- Ethane Supply Demand Forecast
- Bakken Ethane and Vantage Pipeline

Question



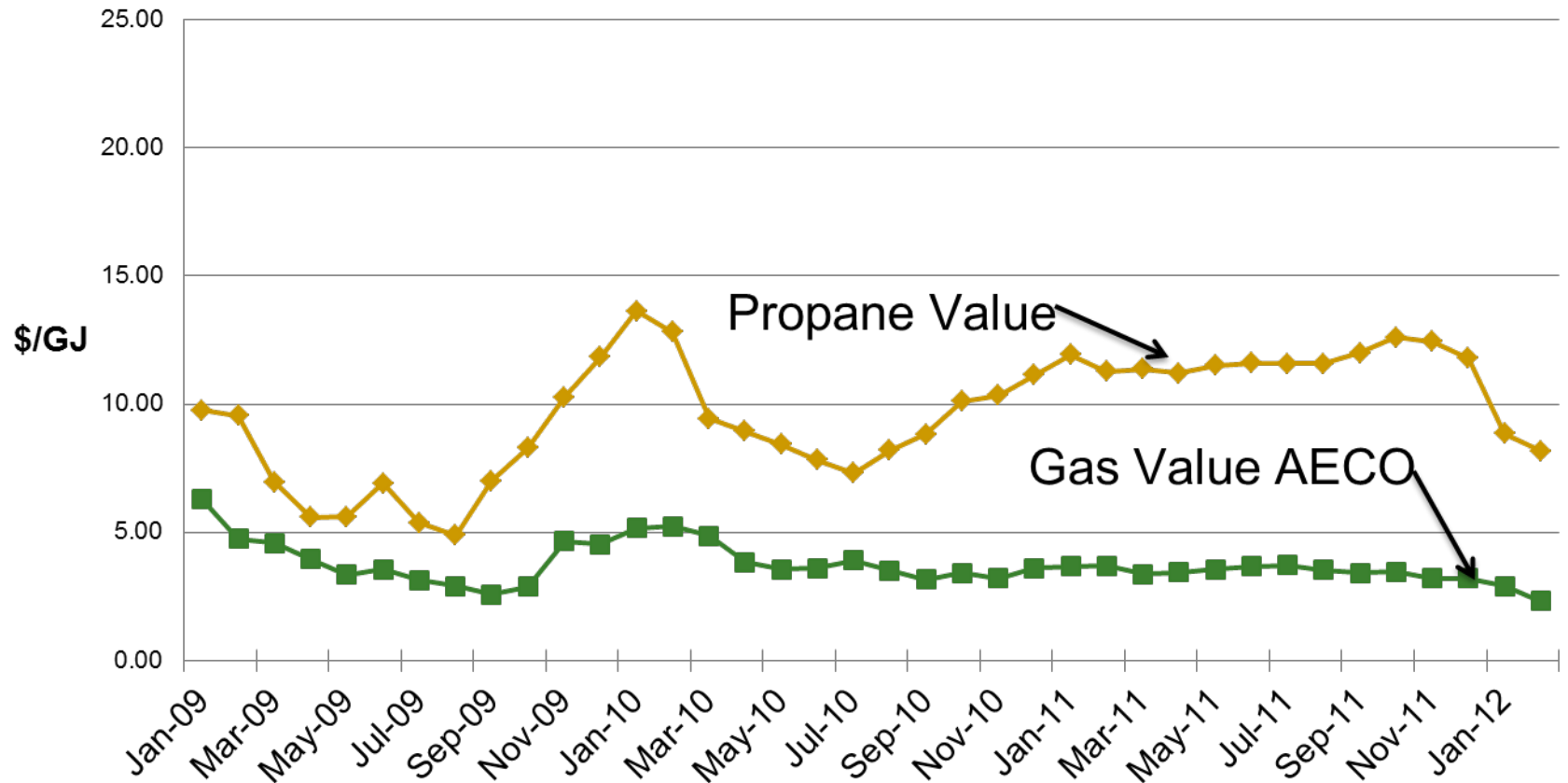
- Why is everyone chasing liquid rich plays?



Propane Value – Edmonton Posting versus AECO



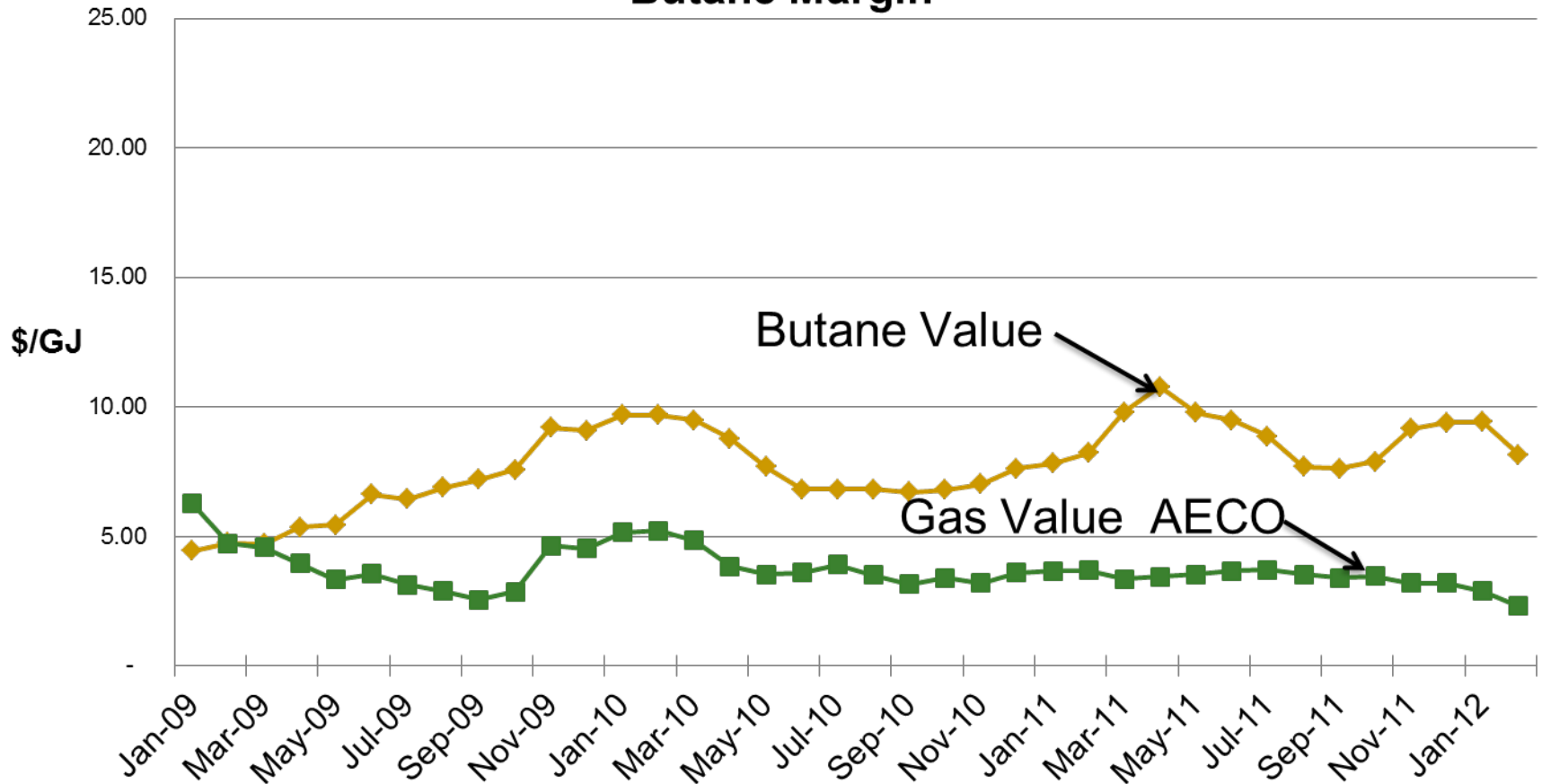
Propane Margin



Butane Value – Edmonton Posting versus AECO



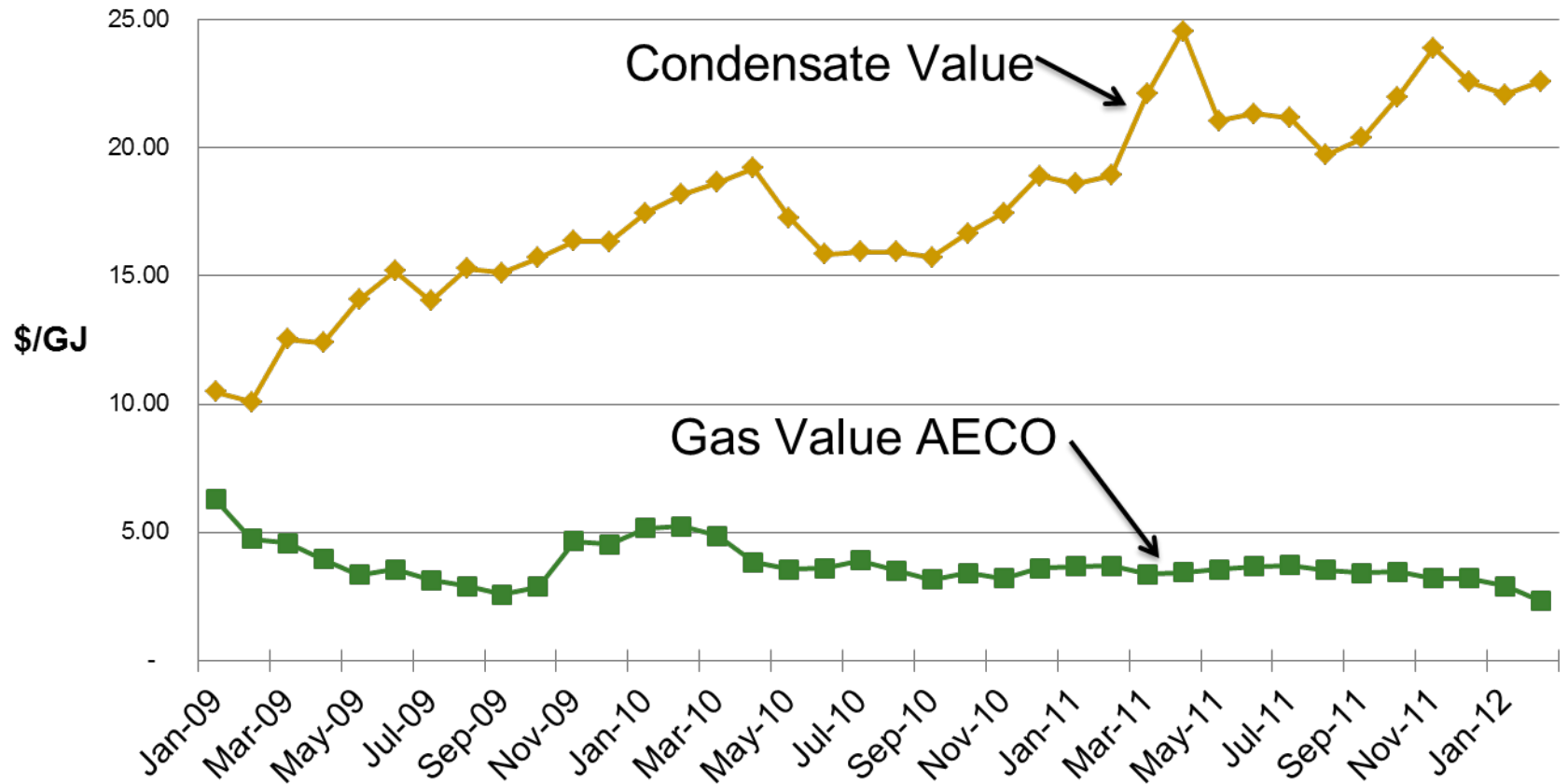
Butane Margin



Condensate Value – Edmonton Posting versus AECO



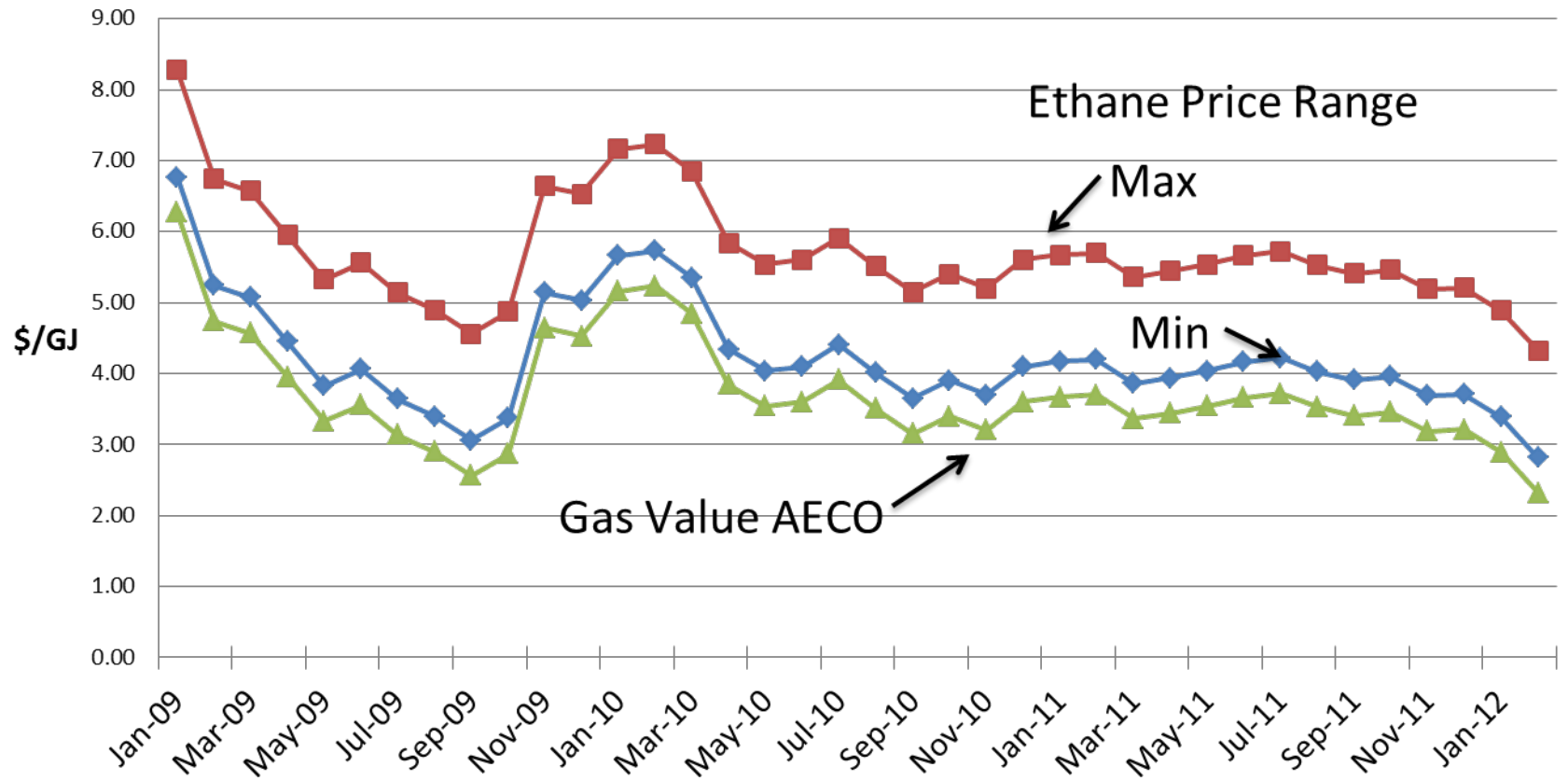
Condensate Margin



Ethane Value Versus AECO



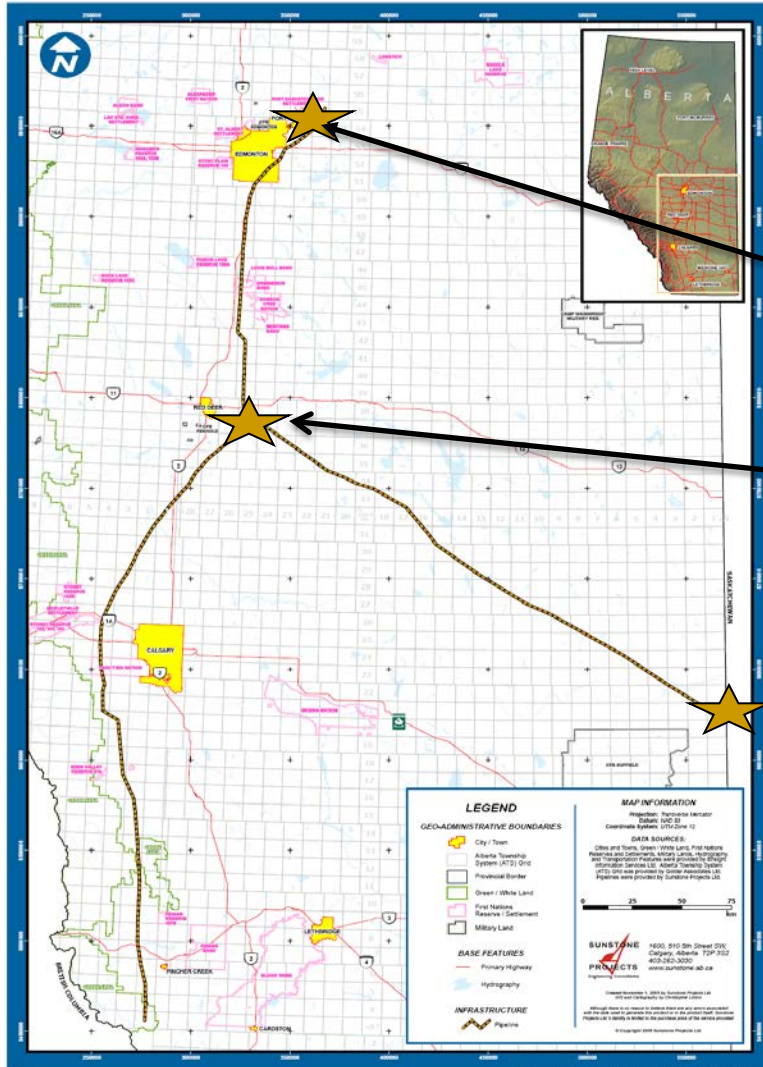
Ethane Margin



Alberta Ethane Gathering System



ALBERTA ETHANE GATHERING SYSTEM



In operation since
1978

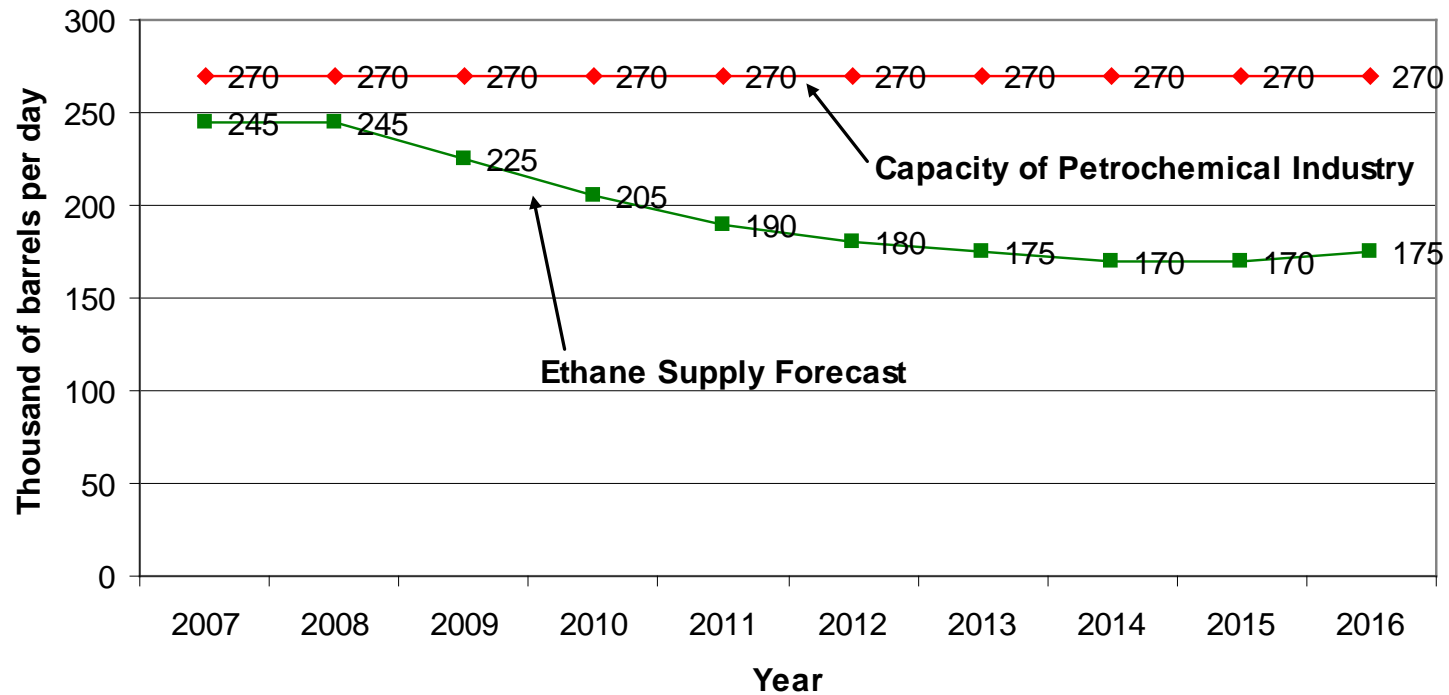
Dow Chemicals ethane consumption
65,000 barrels per day

Nova Chemicals ethane consumption
200,000 barrels per day

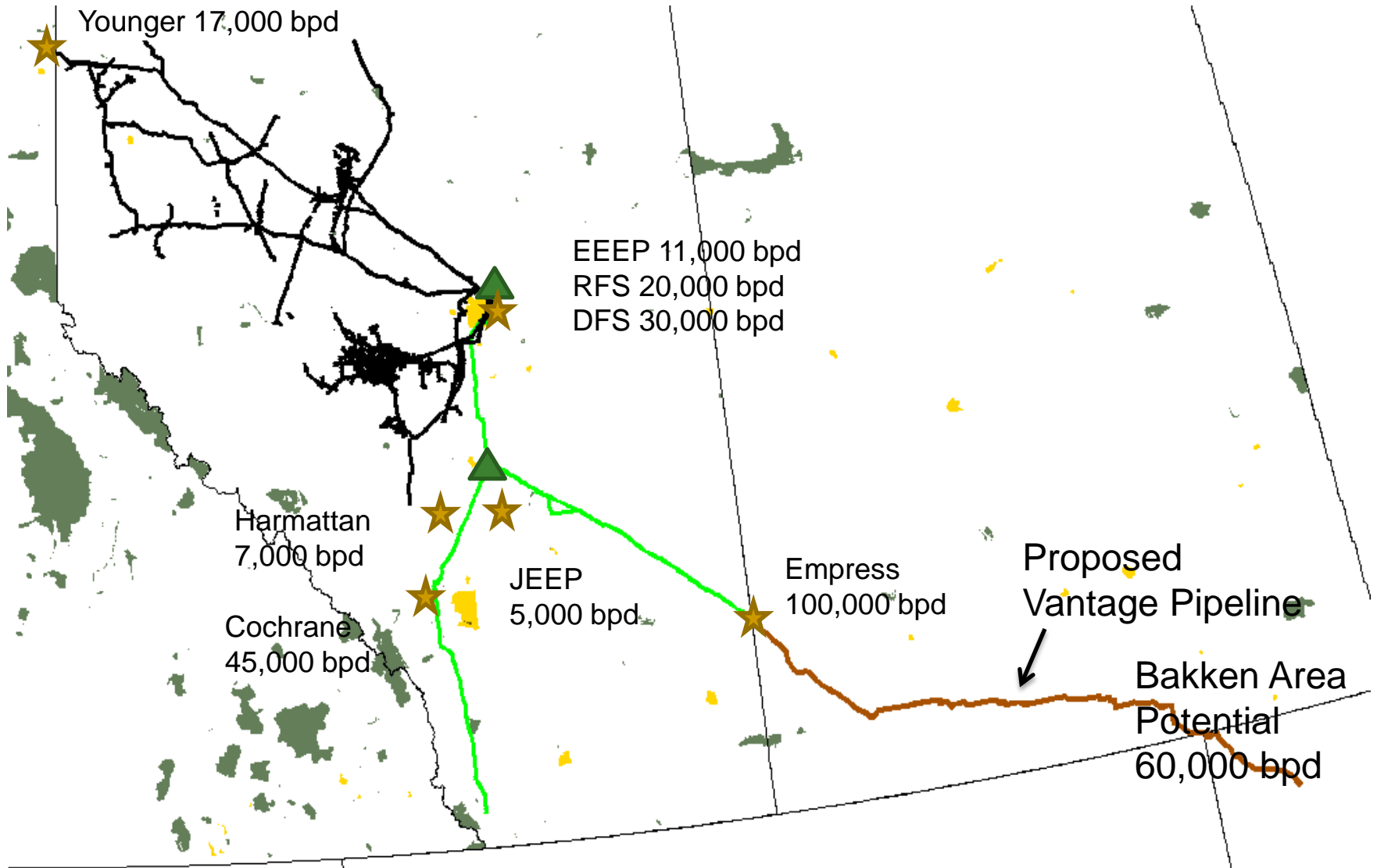
Ethane Supply/Demand in Alberta



Ethane Supply/Demand Forecast for Alberta Petrochemical Industry



Ethane Supply



Younger 17,000 bpd

EEEEP 11,000 bpd
RFS 20,000 bpd
DFS 30,000 bpd

Harmattan
7,000 bpd

Cochrane
45,000 bpd

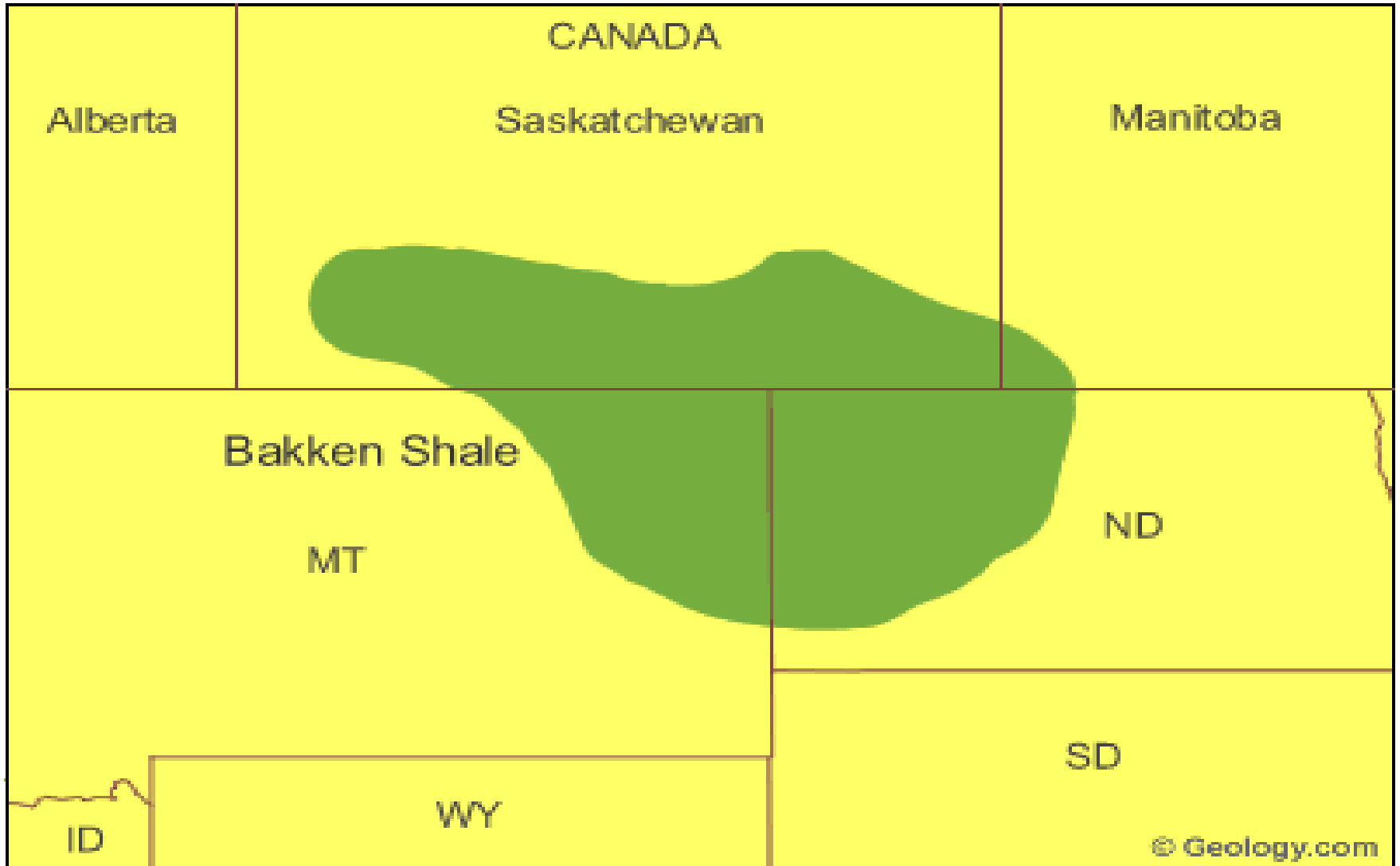
JEEP
5,000 bpd

Empress
100,000 bpd

Proposed
Vantage Pipeline

Bakken Area
Potential
60,000 bpd

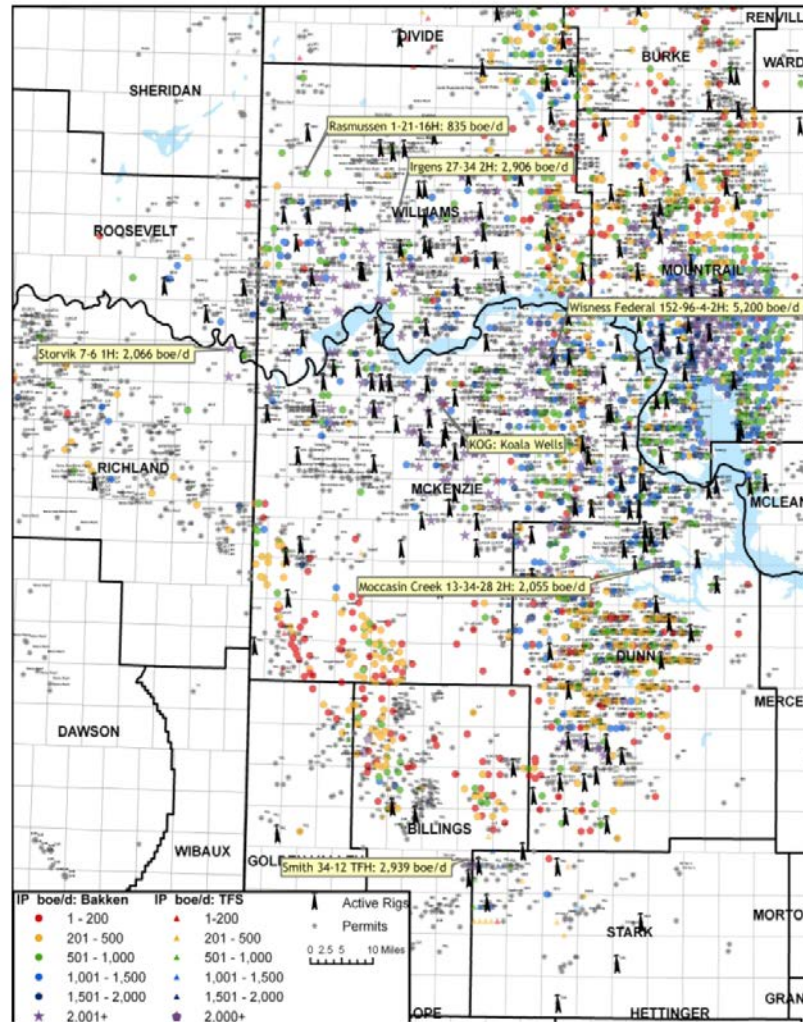
Bakken Oil Play – Liquids Rich



ND Bakken and Three Forks



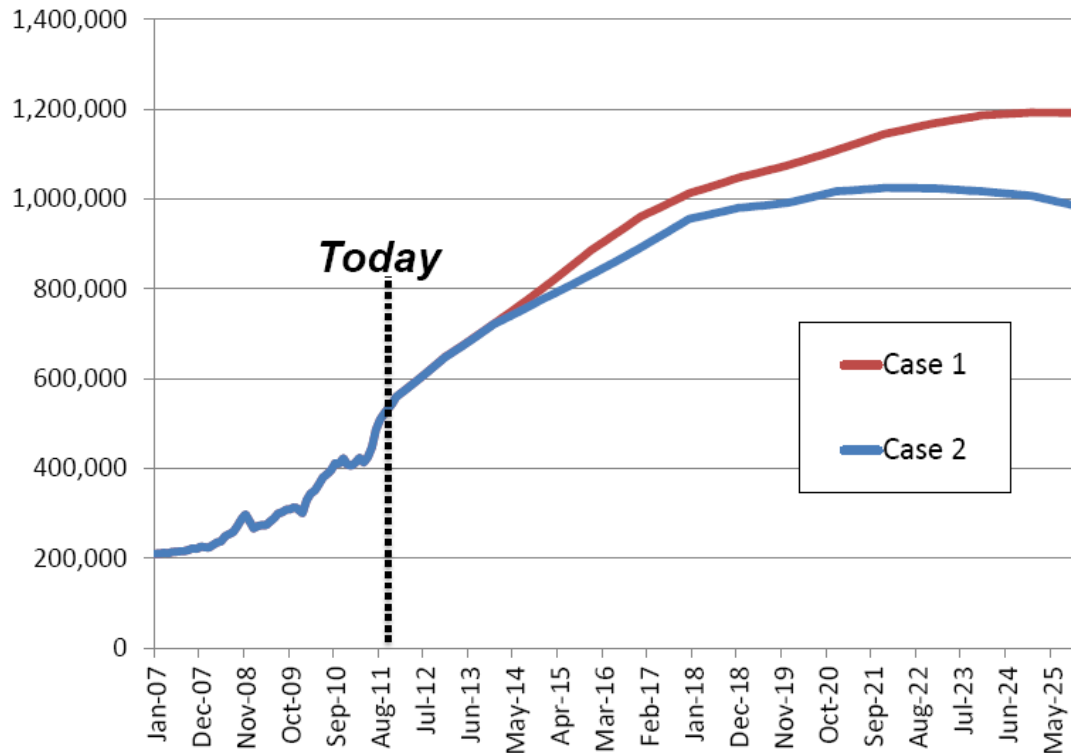
Exhibit 3: Bakken & Three Forks Completions, Rigs, and Permits



Bakken Oil Forecast from NDPA



Forecasting Williston Basin Oil Production, BOPD



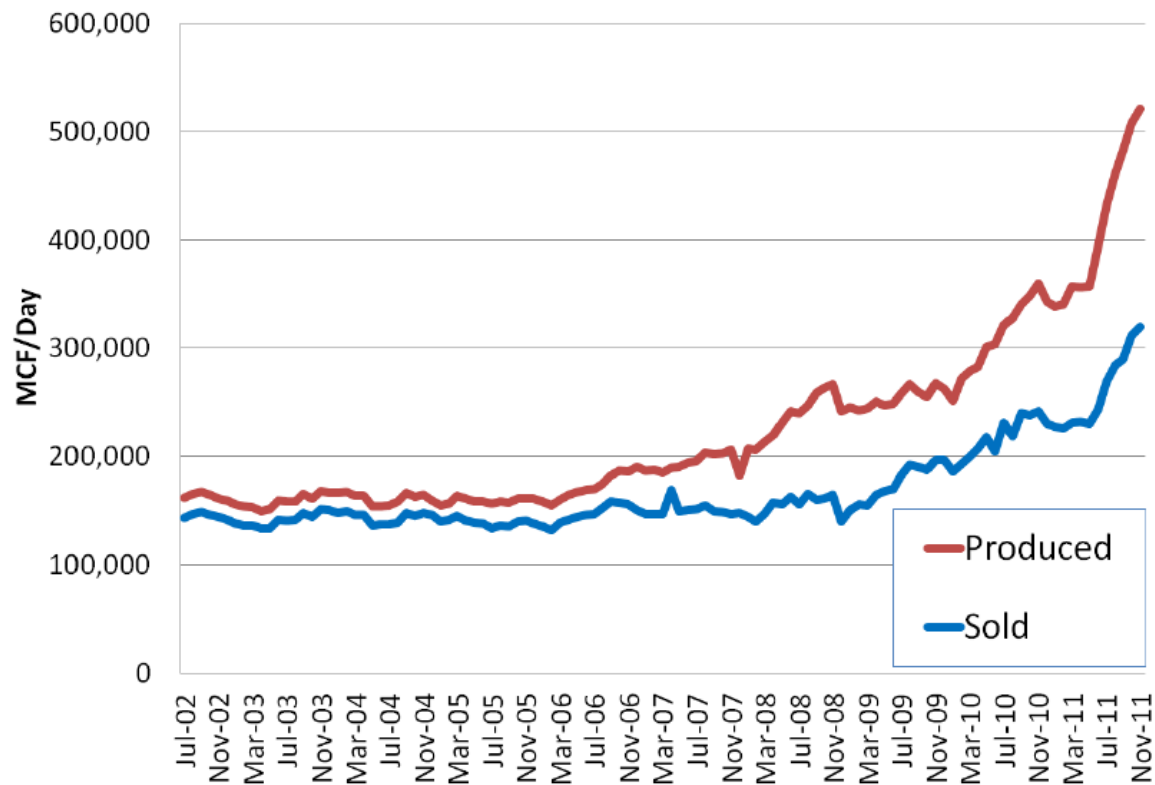
Production forecast is for visual demonstration purposes only and should not be considered accurate for any near or long term planning.



Bakken Natural Gas



ND Gas Production



Vantage Pipeline Overview



- Pipeline from Tioga, North Dakota to Empress, AB
- Pipeline size 10"
- Pipeline initial capacity 40,000 barrels per day
 - Expandable to 60,000 bpd
- 430 miles (700 km)
 - 350 miles (570 km) in SK, 80 miles (130 km) in ND
- 1,440 psi (9,900 kpa), steel, grade 359, extruded polyethylene coating
- Two pump stations 1,000 hp each, 100% spare
- 33 surface block valves
 - Pumps and block valves full scada and controlled by central control room manned 24 hours per day

Vantage Tolls



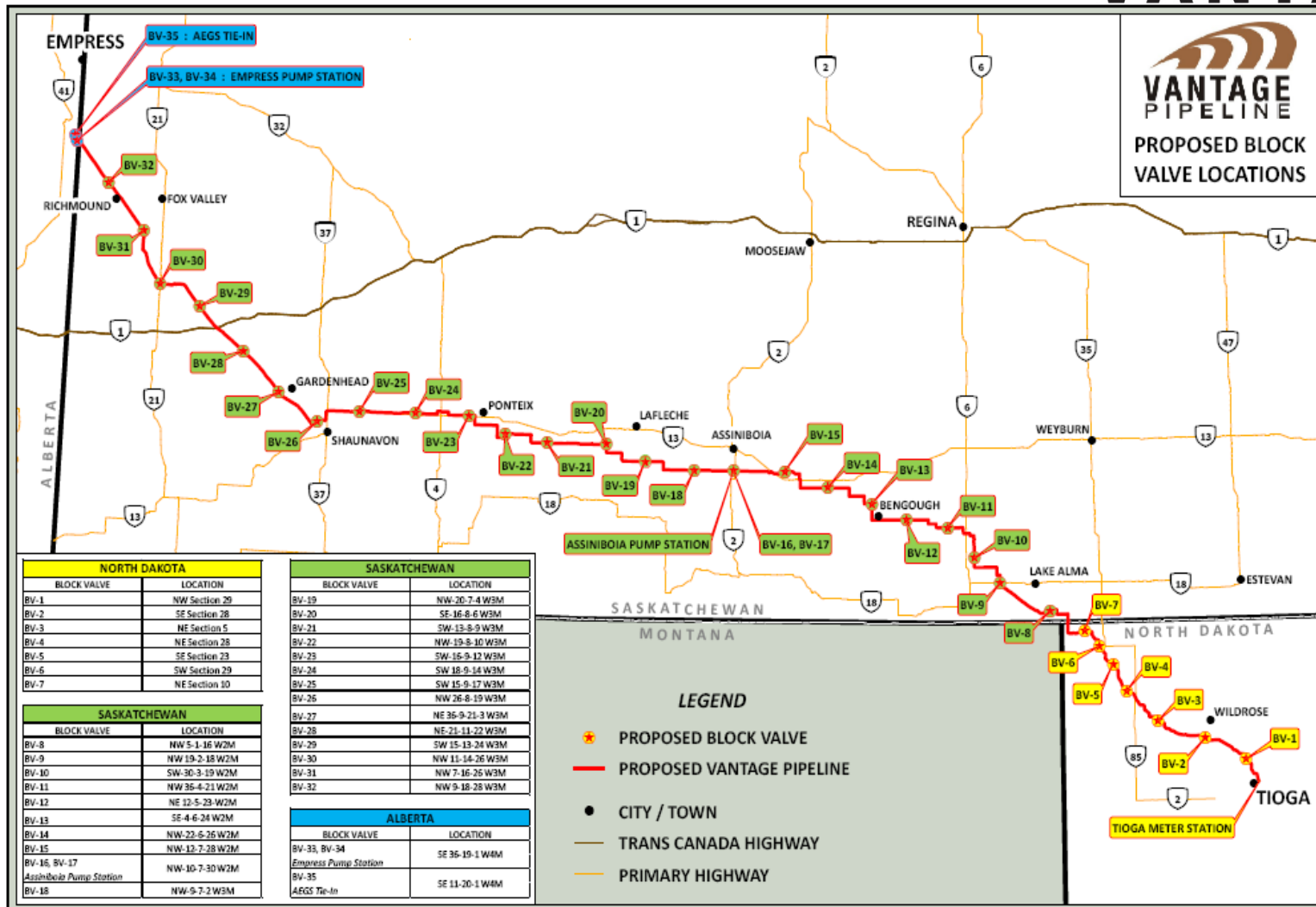
- NEB, Group 2 regulated pipeline in Canada
- FERC regulated tolls in US
- Toll from Tioga to Empress approximately 11 cents per gal
 - Varies with volume, term of contract, take or pay commitments

Route Selection Criteria



- Remain parallel to existing disturbances
 - NEB rule of no more than 75 km non contiguous to existing disturbances along entire pipeline route
 - Avoid populated areas
 - Avoid wetlands and environmentally sensitive areas
 - Avoid government reserve lands
 - Avoid difficult landowners
 - Avoid river/stream crossings
 - Avoid steep or difficult construction terrain
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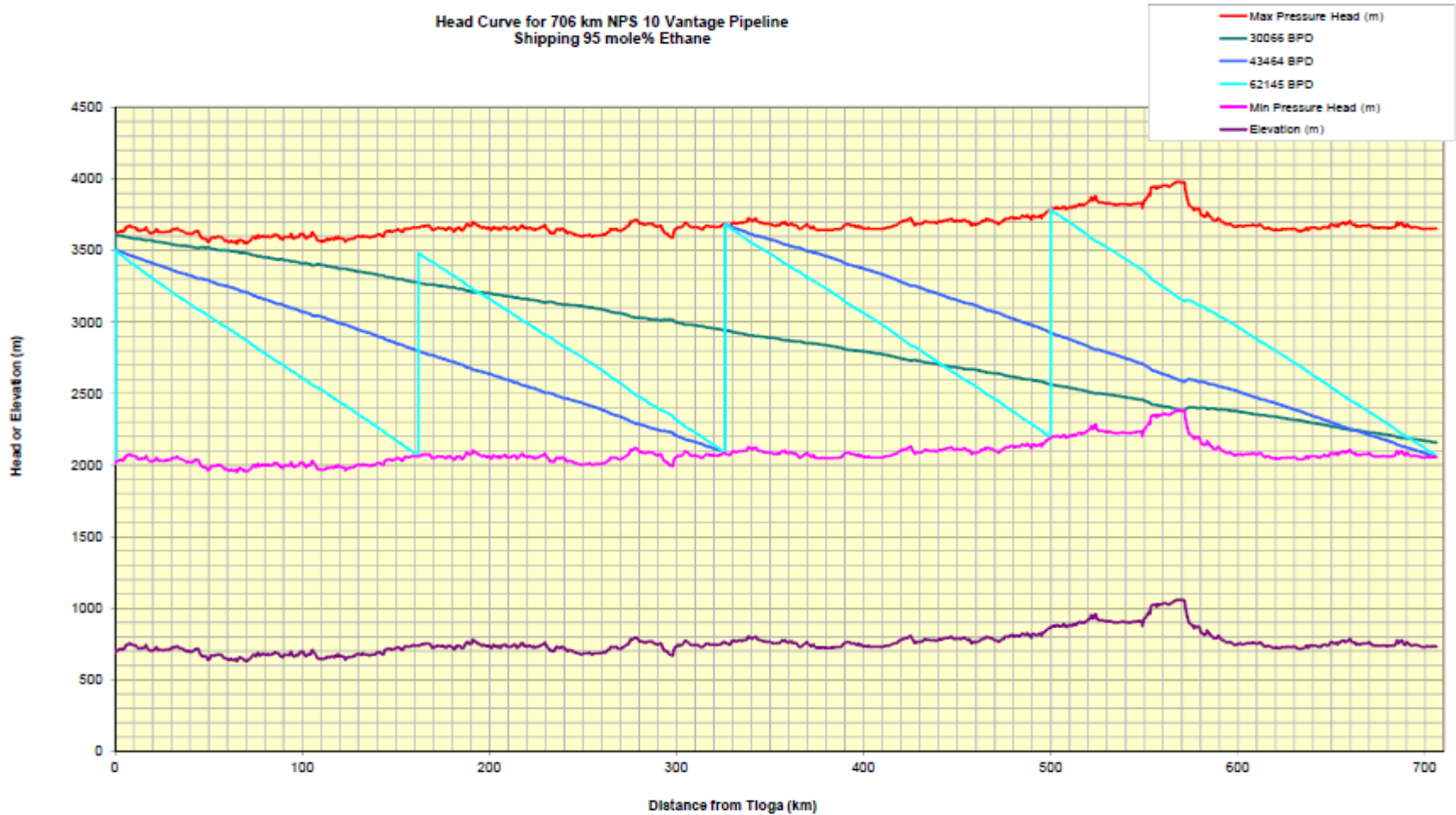
Ethane Pipeline System



Pipeline Hydraulics



Head Curve for 706 km NPS 10 Vantage Pipeline
Shipping 95 mole% Ethane



Vantage Pipeline Status



- NEB permit granted (Canada)
- Department of State (USA) permit pending
- North Dakota permit pending
- 650 land owners in Canada and 130 in US have signed easements
- Consultation with First Nations in Canada complete (no reservations crossed)

Vantage Pipeline Construction

Schedule



- Pipe is ordered
- Induction bends are ordered
- Pumps are ordered
- Construction bids due out next week
 - 5 spreads in Canada and one in US
 - Award in June/July
 - Mobilize in August
 - Complete pipeline in Nov
- Remobilize in March of 2013 to complete pump stations and above ground valve stations
- Commission and start up in June of 2013

Questions



- Who is Vantage Pipeline
 - Managed by private company called Mistral Energy Ltd. based out of Calgary
 - Vantage is owned by private equity fund called Riverstone based out of New York