

Badlands NGLs, LLC

Canadian Energy Research Institute

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TOPICS

- The Alberta Advantage- Is there or will there be a U.S. or North Dakota “Advantage?”
- Worldwide PE feedstock supply/demand economics
- North American and Related Feedstock Considerations- NGLs, Ethane and Naphtha
- Badlands Facility Plans

Will There be a U.S. “Alberta Advantage?”

- Reliance on extraction revenues in lieu of taxation to boost public sector *and* growth of both exploration and value added market sectors.
- In the U.S. part one is satisfied in the Marcellus, the Permian and in North Dakota.....Part two is only satisfied in Texas/Louisiana.
- The Marcellus/Bakken “Disparity”oil and gas producers benefit in Marcellus but not in the Bakken.

The Marcellus/Bakken “Disparity”

- Build polyolefins only on the Gulf Coast?- Shell Marcellus and Braskem Marcellus support the idea of building polyolefins close to production.
- Marcellus ethane- 60 Mb/d and 240 Mb/d of ten year *committed*, take or pay export to Europe (25% of European capacity) and India.
- Who pays?- European and Indian PE manufacturers pay BTU ethane *plus \$0.35/gal.* transportation costs.
- Shell and Braskem ethane at ethane BTU price- *no freight* and producers make \$\$\$\$.

The Marcellus/Bakken “Disparity”

- Polyolefins in North Dakota?
- Shell and Braskem validate the “close to production” strategy.
- Lots of ethane
- Closer to U.S. markets than Gulf Coast facilities *and* cheaper and closer to Asian export markets
- *But.....all Bakken ethane that is not “rejected” and sold as natural gas BTU’s is sold at a material loss to producers*
- *At \$100 WTI no problem? At \$50-\$60 WTI –big problem.*

Badlands 2020 Bakken NGL and Ethane Outlook

- Studied \$60, \$70 and \$90 WTI price to forecast NGL and ethane production.
- Badlands “base case” is 2020 \$70 WTI oil price, resulting in production of 2.4 Bcf/day of Bakken gas with 11 gallons of NGL/Mcf.
- Alliance/Aux Sable- full; Vantage- full; ONEOK- full.....Northern Border pipeline goes from current 120 Mb/d of “rejected ethane (1060 BTU/cu.ft.)” to.....200 Mb/d of “rejected ethane (1100+BTU/cu.ft.)” *without adjustments for increased ethane due to Bakken Header project, crude pre-treatment or increased Three Forks drilling.*

Bakken 2015-2020 Ethane Macroeconomics

- In 2015 Bakken ethane sold at Ventura BTU value “nets back” \$0.15-\$0.17/gal. to producers.
- In 2015 Bakken ethane exported from North Dakota “nets back” (\$0.10)/gal. to (\$0.15)/gal. to producers.
- By 2020, using today’s WTI pricing, if all Bakken ethane were transported to the Gulf Coast at today’s pricing disparity; the net loss to producers would equal the value of losing 50 Mb/d of crude oil production.

Physically Stranded Bakken NGLs

- Even with full Bakken ethane export to Canada, Illinois and Texas, Northern Border ethane content of not less than 200 Mb/d exceeds Ventura heat standards- ethane is physically stranded, *and*
- NGL export to Texas requires 240 Mb/d of demand capacity versus 165 Mb/d of actual capacity- NGLs are physically stranded, *and*
- *How does one justify new export CAPEX and OPEX in a \$0.50/gal. NGL world where producers lose money?*

Economically Stranded Bakken NGLs

- Northern Border gas sales will be constrained by excessive heat content- 1100+BTU/cu.ft. at not less than 200Mb/d of ethane content....*despite 100% capacity ethane export to Canada, Illinois and Texas, and*
- Interstate NGL take-away will need to almost double from 165 Mb/d to 240 Mb/d *at very low NGL prices, and*
- Producers *and Wall Street* will have no patience for the Marcellus/Bakken “Disparity”

Badlands Plans

- Two World Scale PE facilities- 1.5+ million MT of ethane feedstock ethylene and corresponding PE assets.
- Two locations- North Dakota and “Shangri-La”
- First- Shangri-La- on the “water,” existing cracker design, modular construction, 36 months to hydrocarbons
- Second- North Dakota- not on the “water”

Badlands Plans- Technology

- “Name Brand” cracker technology- examples of “name brands” include Technip and Linde.
- “Name Brand” PE technology- examples of “name brands” include INEOS and Univation.
- Captive Co-Monomer Manufacture- “Name Brand”
- Product Off-Take- “Name Brand”

Badlands Plans- Agreements

- Feedstock Agreement(s)- Advanced stage
- EPC- Agreement in principal, *lump sum turn key*
- Financing- advanced stage
- Site Selection- Advanced stage, Shangri-La site selected, North Dakota close to selection

Badlands Plans- Strategy

- 36 Months to Hydrocarbons
- FEED/OBE Engineering in 2015-2015 (12 months)
- Long Lead Equipment (both sites) in 2015
- Shangri-La modules delivered “on the water” to site that has already been identified.

The “U.S. Advantage”

- Build PE assets as close as possible to NGL sources
- Reward oil and gas producers for NGL and ethane production
- Realistically evaluate economics for all