Fuel Transport from North Dakota and Canada: Pipelines

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Background

- Total U.S. production = 15.8 million barrels/day
- Minnesota has been crude oil conduit since 1950 when first pipeline carrying Canadian crude to U.S. was completed
- Heavy crude (tar sands oil) began moving through the state in the late 60's
- Existing network transports 2.8 million barrels/day through Minnesota to refineries here and throughout the Midwest
- Roughly 15% of that total is refined in state at two refineries, Flint Hills and Northern Tier

Bakken Outlook

- New drilling technology has enabled recovery of light sweet crude from Bakken field, with estimated reserves of 7.4 billion barrels
- 10,000 wells drilled to date with peak wells estimated between 45,000 to 60,000 wells
- Current estimates put field life at 40 years, with production declining rapidly after peak

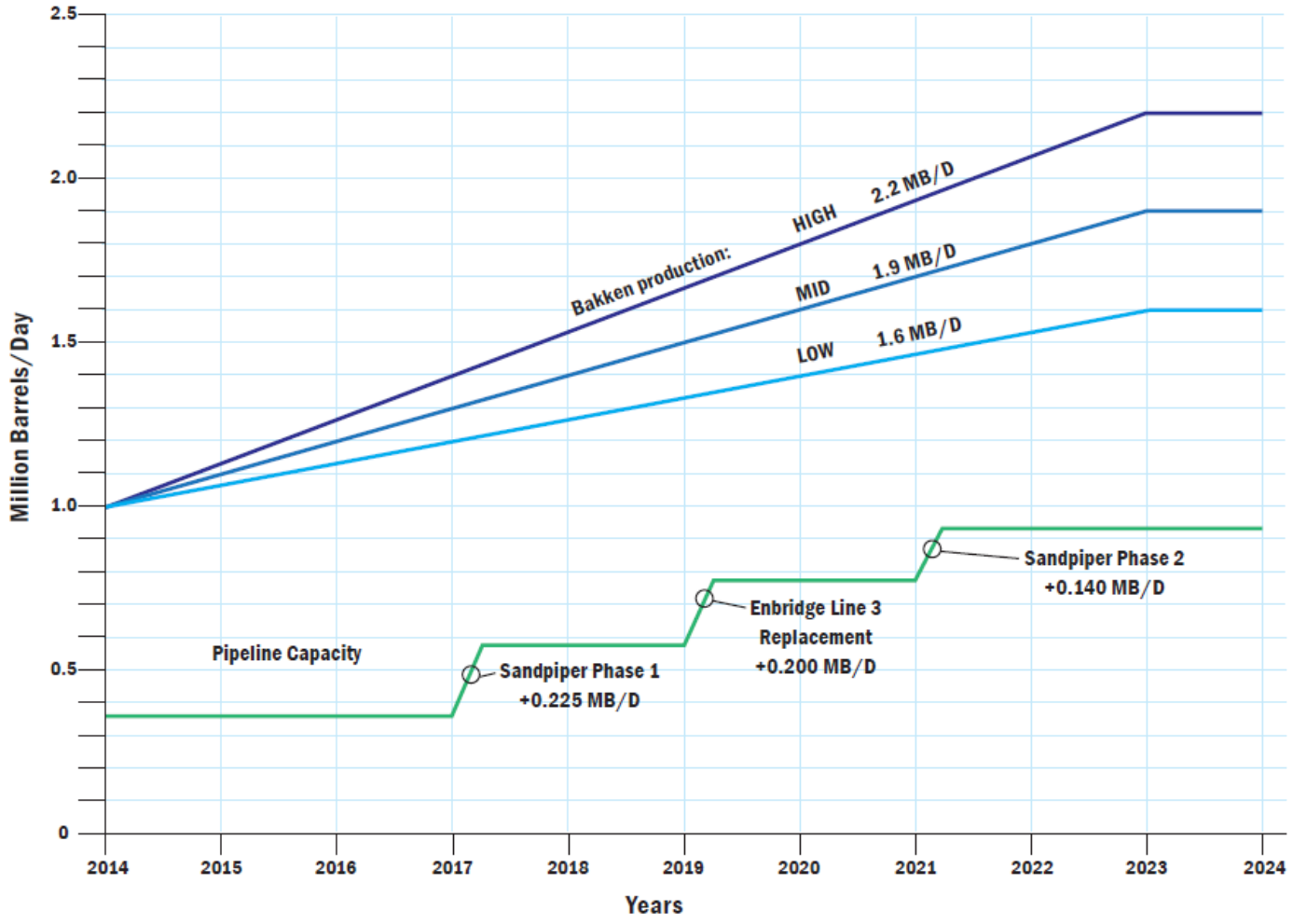
Bakken Oil Transport

- Lack of sufficient pipeline infrastructure has so far resulted in majority of oil moving by rail
- Of current 1 million barrels/day shipped, 1/3 is moving by pipeline, the rest by rail; seven of nine trains leaving Bakken move through MN
- Proposed pipelines would move significant quantities, but would not be expected to supplant oil shipments by rail

Proposed Pipeline Expansions

- Sandpiper Phase 1 – in permitting now, would carry 225,000 b/day starting in 2016/17
- Rebuild Line 3 would add 370,000 b/d with new pumping stations
- Sandpiper Phase 2 would increase flow to 365,000 b/d, or increase of 140,000 b/d
- Total projected expansion = 735,000 b/d by 2024

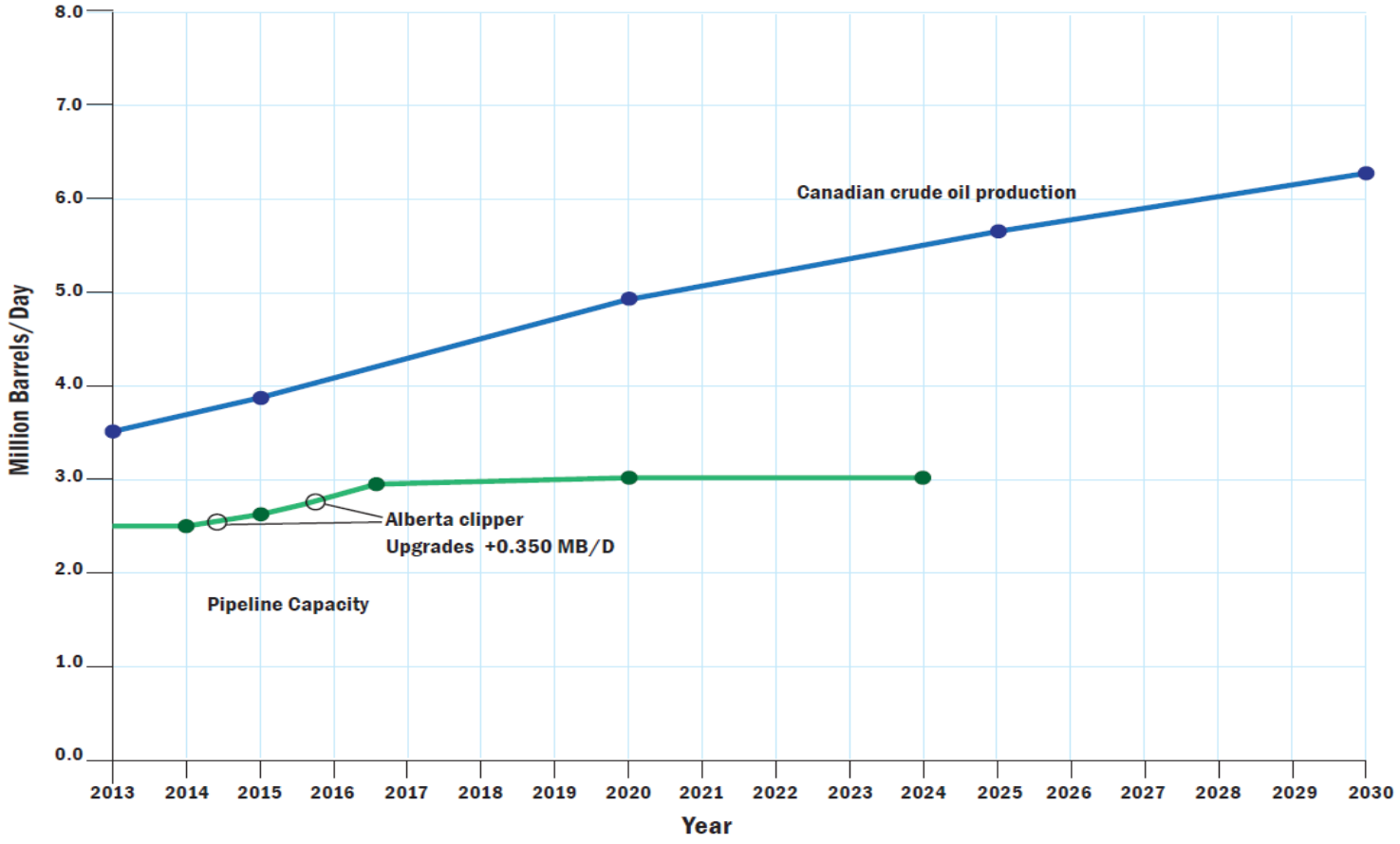
Bakken Production Projections and Pipeline Capacities



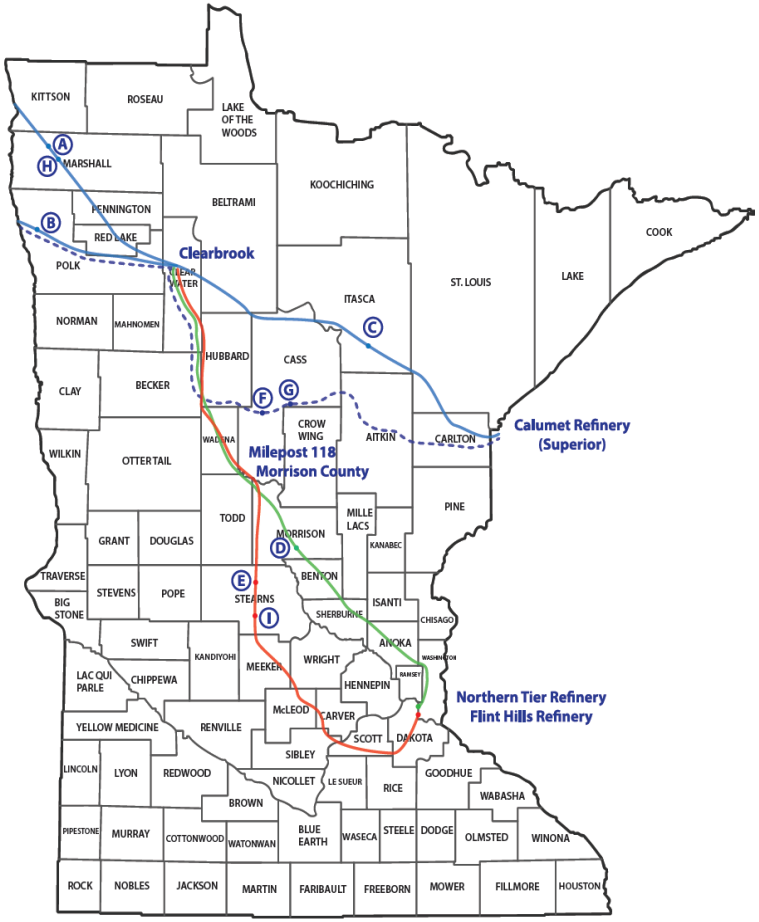
Canadian Crude

- Total Canadian crude oil production (combination of light and heavy) stands at 3.5 million b/d
- This is expected to grow to 6.4 million b/d by 2030
- Most Canadian crude to Minnesota moves over the Alberta Clipper line, but rail is expected to play increasing role

Canadian Crude



Crude Oil Pipeline Map



A =Enbridge System - Canada to Clearbrook
B= Enbridge North Dakota Pipeline 81
C= Enbridge System from Clearbrook to Superior
D= Minnesota Pipeline Company - North
E= Minnesota Pipeline Company - South
F= Enbridge Sandpiper
G= Enbridge Line 3 Replacement
H= Enbridge Alberta Clipper Capacity Upgrade
I = Minnesota Pipeline Company - Upgrade

Pipeline Regulatory Review

- Crude oil pipelines require Certificate of Need and Route Permit from the Minnesota PUC
- For CON, applicant must demonstrate:
  - Denial would adversely affect future adequacy, reliability of energy supply to applicant, applicant's customers or to people of Minnesota or neighboring states
  - A more reasonable or prudent alternative has not been demonstrated by parties other than applicant

Regulatory Review Continued

- The consequences of granting CON are more favorable than consequences of denying, considering effects of proposed facility on natural and socioeconomic environments
- No demonstration that the design, construction or operation of proposed facility will fail to meet policies, rules or regulations of local, state or federal agencies
- MN Rules 7851.0120

Route Approval

- Begins with applicant's proposed route and route alternatives developed after public meetings and landowner notifications in affected corridor
- PUC asks Commerce to conduct environmental review of proposed route in accordance with MEPA, state rules
- System alternatives may also be considered

Final Thoughts

- Canadian and Bakken oil raise serious issues for Minnesota and U.S.
  - Domestic energy security vs. environmental risks
  - Need for oil in Minnesota vs. neighboring states
  - Safety of oil by rail vs. pipeline
  - Pressure on rail to move non-oil commodities
  - Climate change