Northern Border Pipeline Company
Operated by TransCanada

NORTHERN BORDER PIPELINE
Minnesota PUC Presentation

February 3, 2015

Agenda

Northern Border Overview

- Ownership and operator
- System design and capacity
- Commercial structure
- Connected gas supply and markets

Minnesota Gas Market

- Interstate gas infrastructure
- Gas demand and growth
- Price and market liquidity
- Challenges

Rochester Gas Supply Project

- Northern Border proposal

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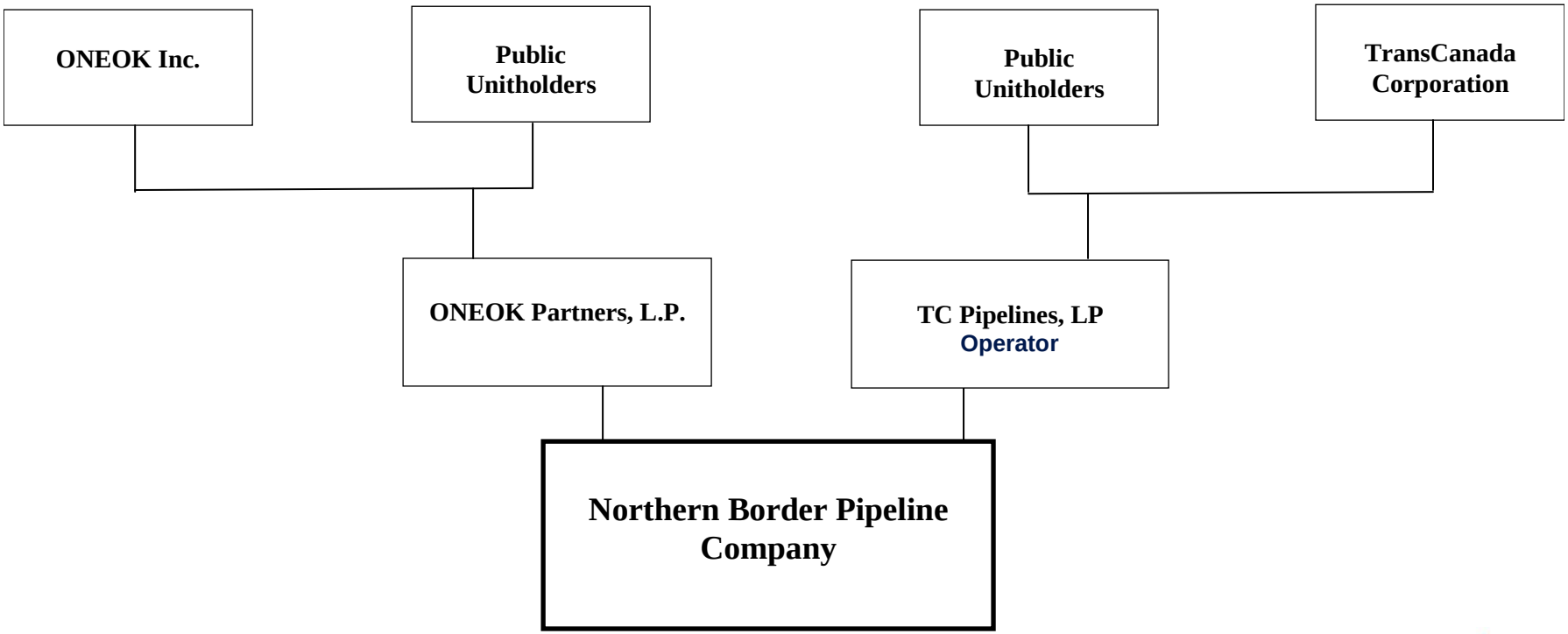
Northern Border Ownership Structure

Ownership*



* *Simplified view.*

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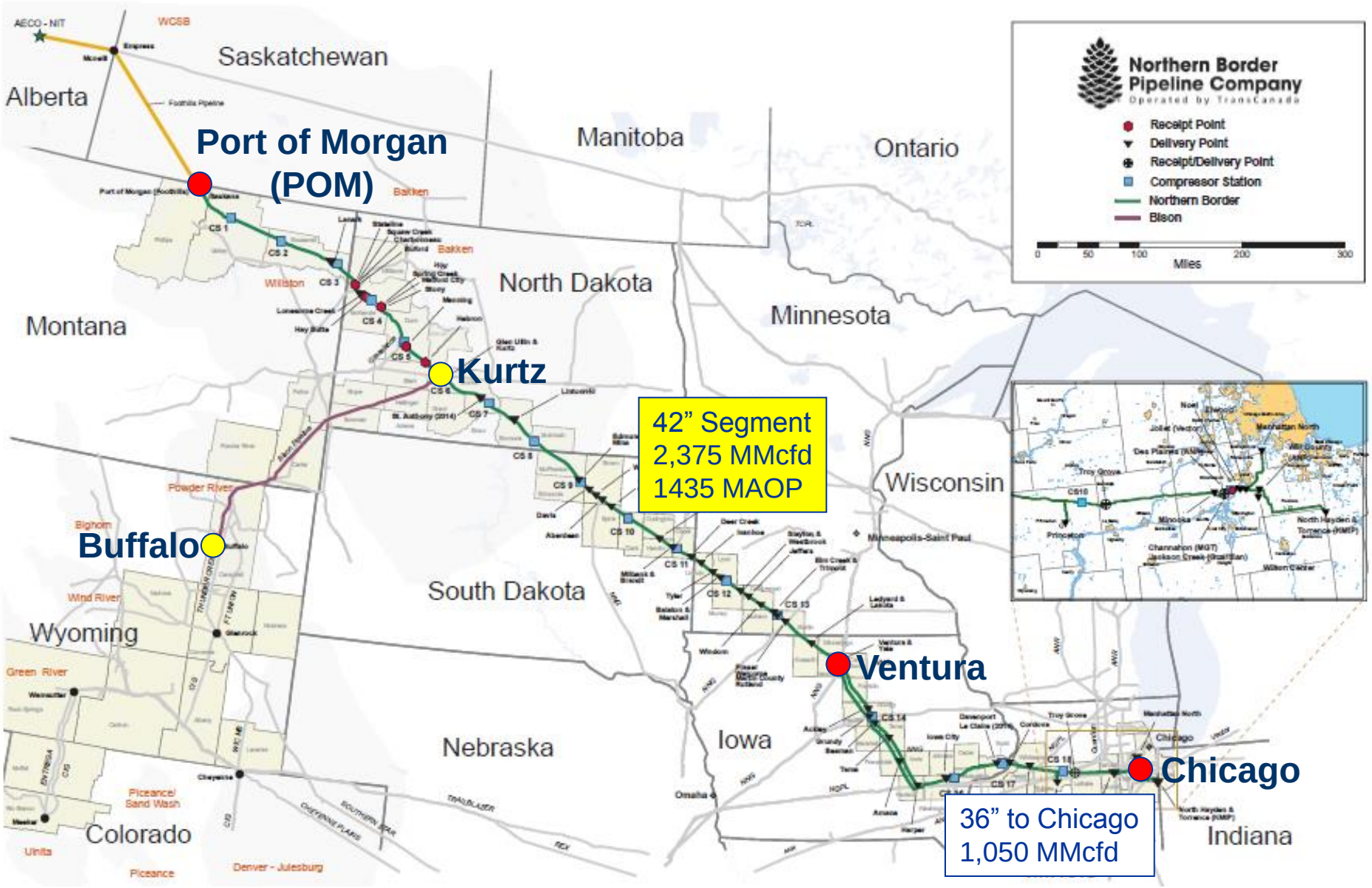
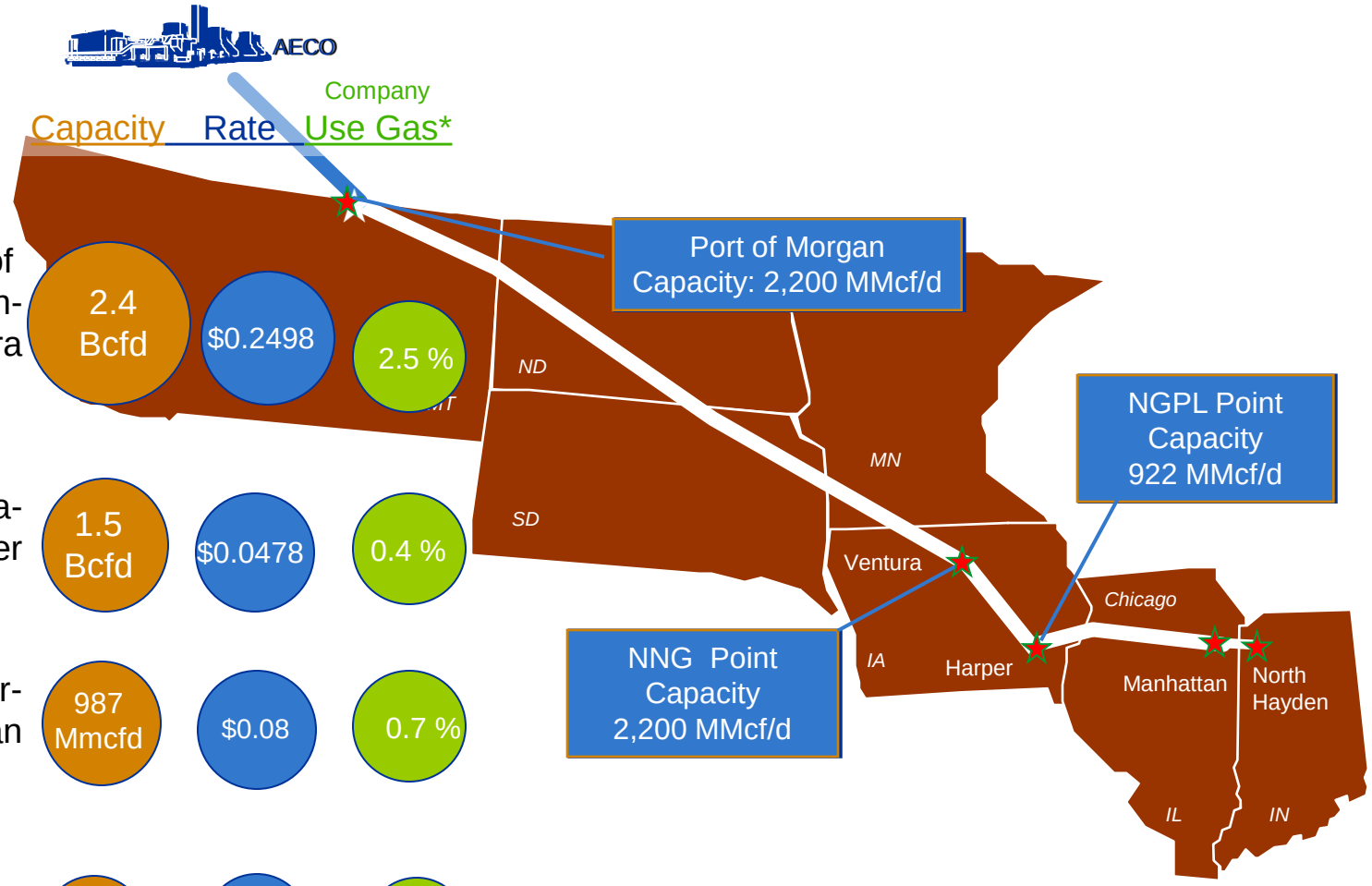
Northern Border Pipeline



Northern Border Pipeline

	Capacity	Rate	Company Use Gas*
Port of Morgan-Ventura	2.4 Bcfd	$0.2498	2.5 %
Ventura-Harper	1.5 Bcfd	$0.0478	0.4 %
Harper-Manhattan	987 Mmcfd	$0.08	0.7 %
Manhattan-North Hayden	557 Mmcfd	$0.0113	0.1 %
Total		$0.3889	3.7%



Rates Include Compressor Usage Surcharge

**2013 Average Fuel*

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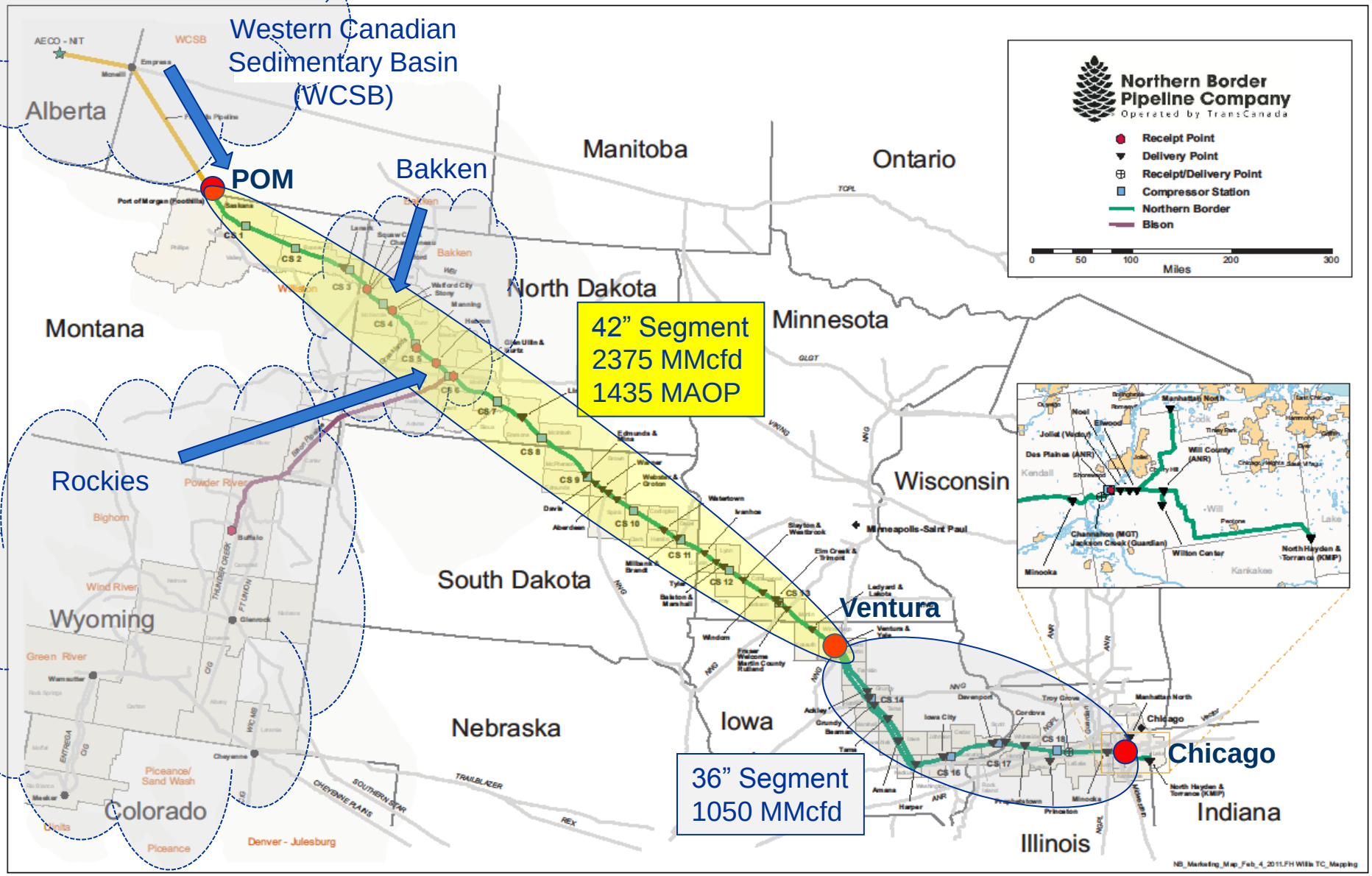
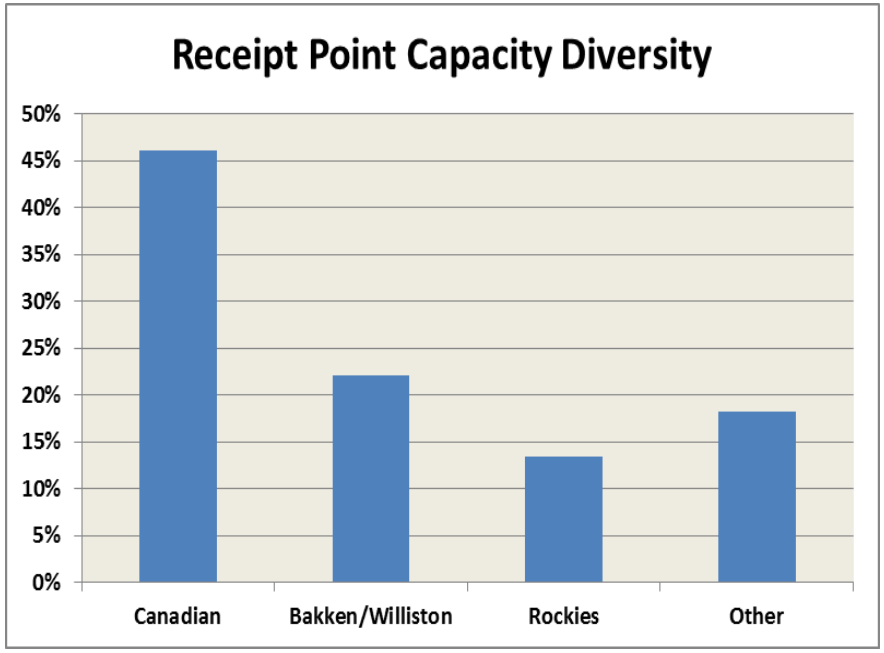
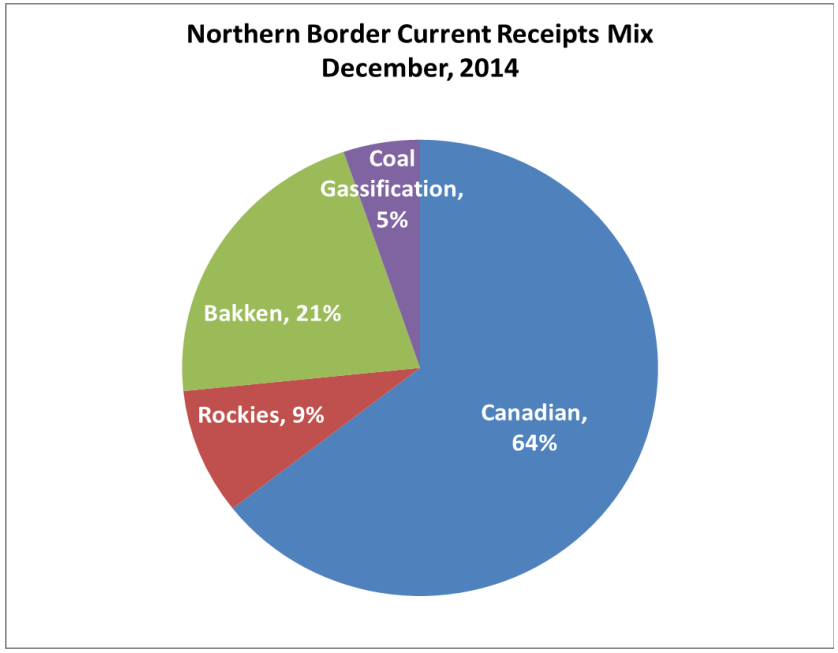
Northern Border Pipeline Segments



Northern Border Supply Diversity





Northern Border has 4.75 BCF of Receipt Point Capacity

Source: Internal Analysis, Upstream of Ventura

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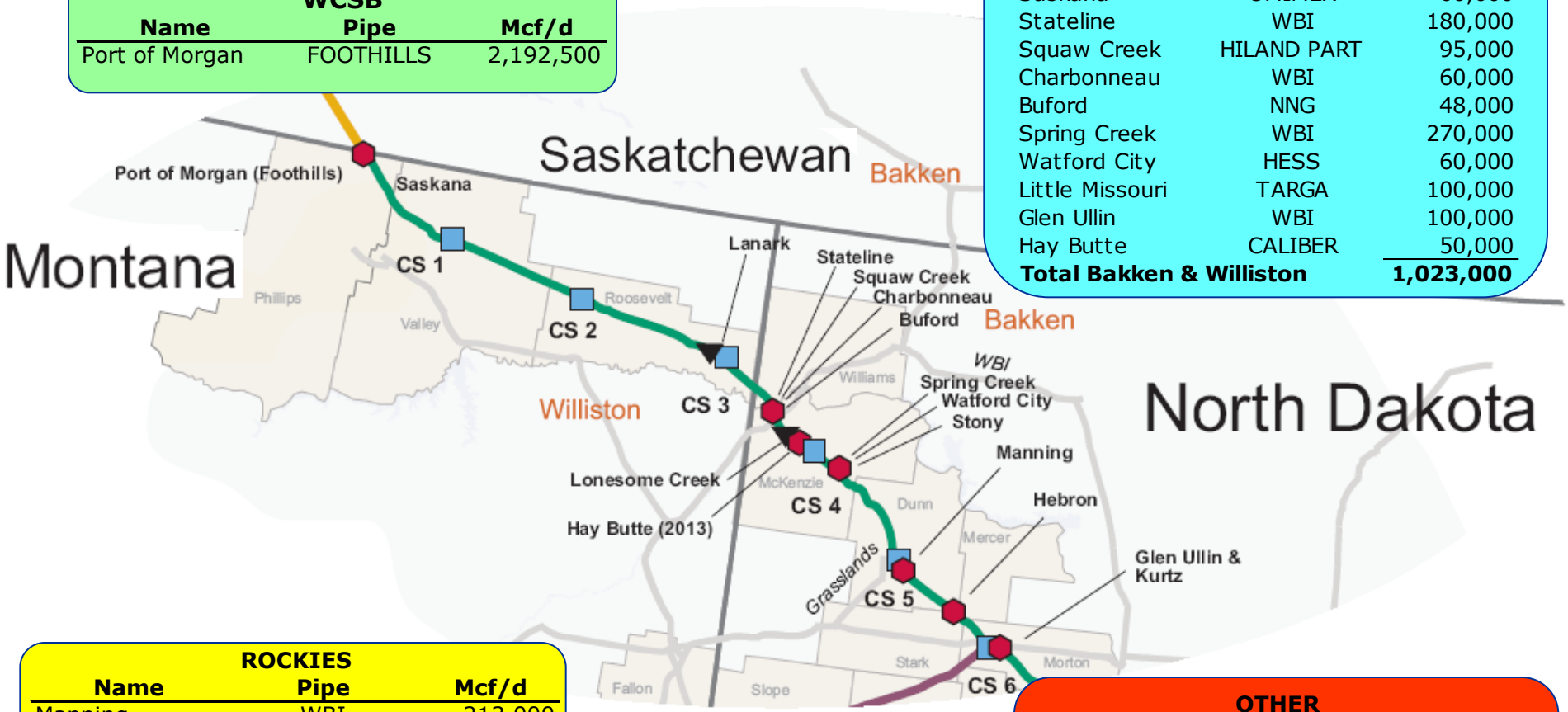
Northern Border - Growing U.S. Supply

WCSB

Name	Pipe	Mcf/d
Port of Morgan	FOOTHILLS	2,192,500

BAKKEN & WILLISTON

Name	Pipe	Mcf/d
Saskana	OMIMEX	60,000
Stateline	WBI	180,000
Squaw Creek	HILAND PART	95,000
Charbonneau	WBI	60,000
Buford	NNG	48,000
Spring Creek	WBI	270,000
Watford City	HESS	60,000
Little Missouri	TARGA	100,000
Glen Ullin	WBI	100,000
Hay Butte	CALIBER	50,000
Total Bakken & Williston		**1,023,000**



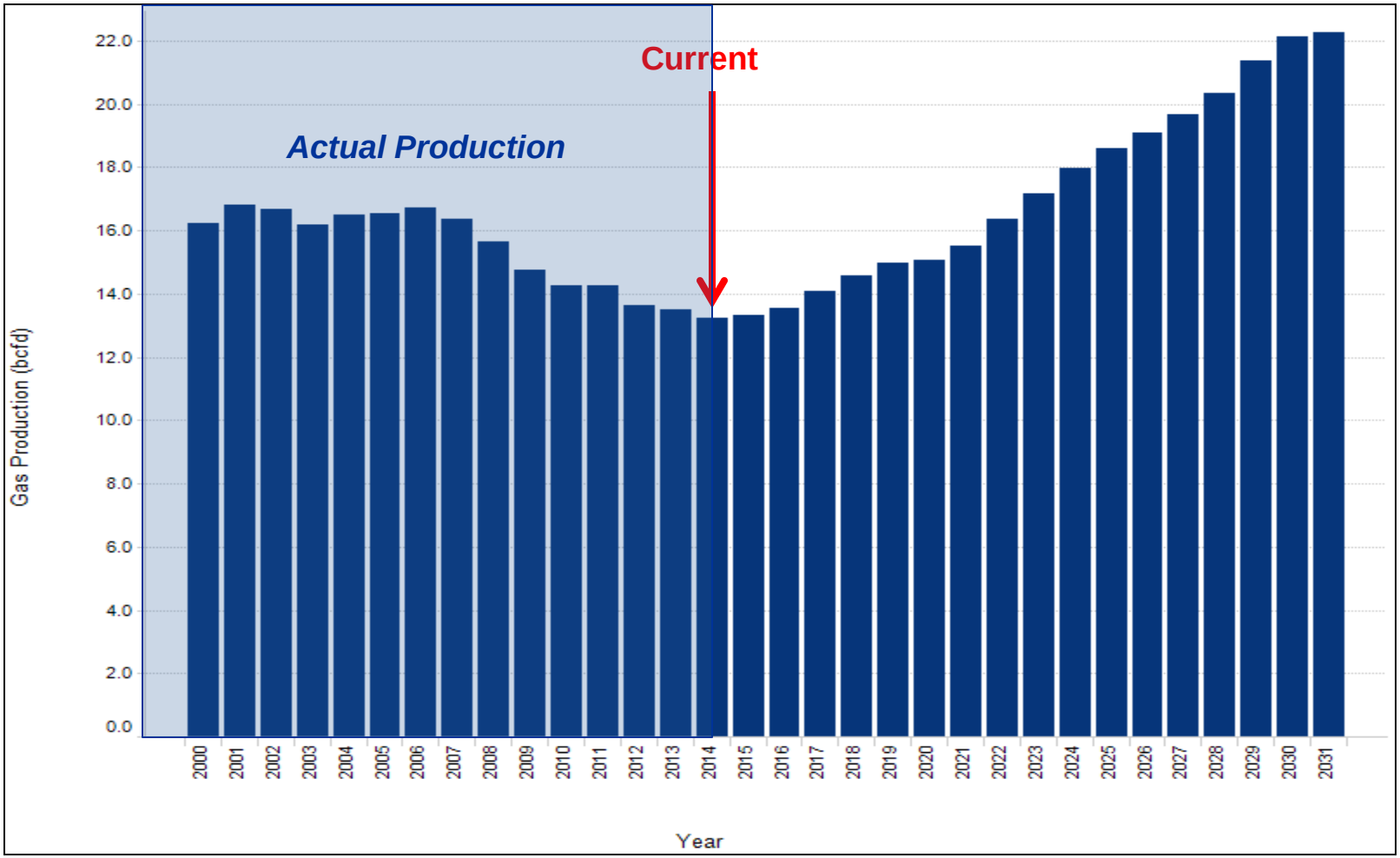
ROCKIES

Name	Pipe	Mcf/d
Manning	WBI	213,000
Kurtz	BISON	407,000
Total Rockies		**620,000**

OTHER

Name	Pipe	Mcf/d
Hebron	DAKOTA GAS	160,000
Troy Grove	NICOR	400,000
Channahon	MIDWESTERN	236,000
Des Plaines	ANR	60,000
Total Other		**856,000**

WCSB Production – Historic & Forecast



Source: Wood-Mac - 2014

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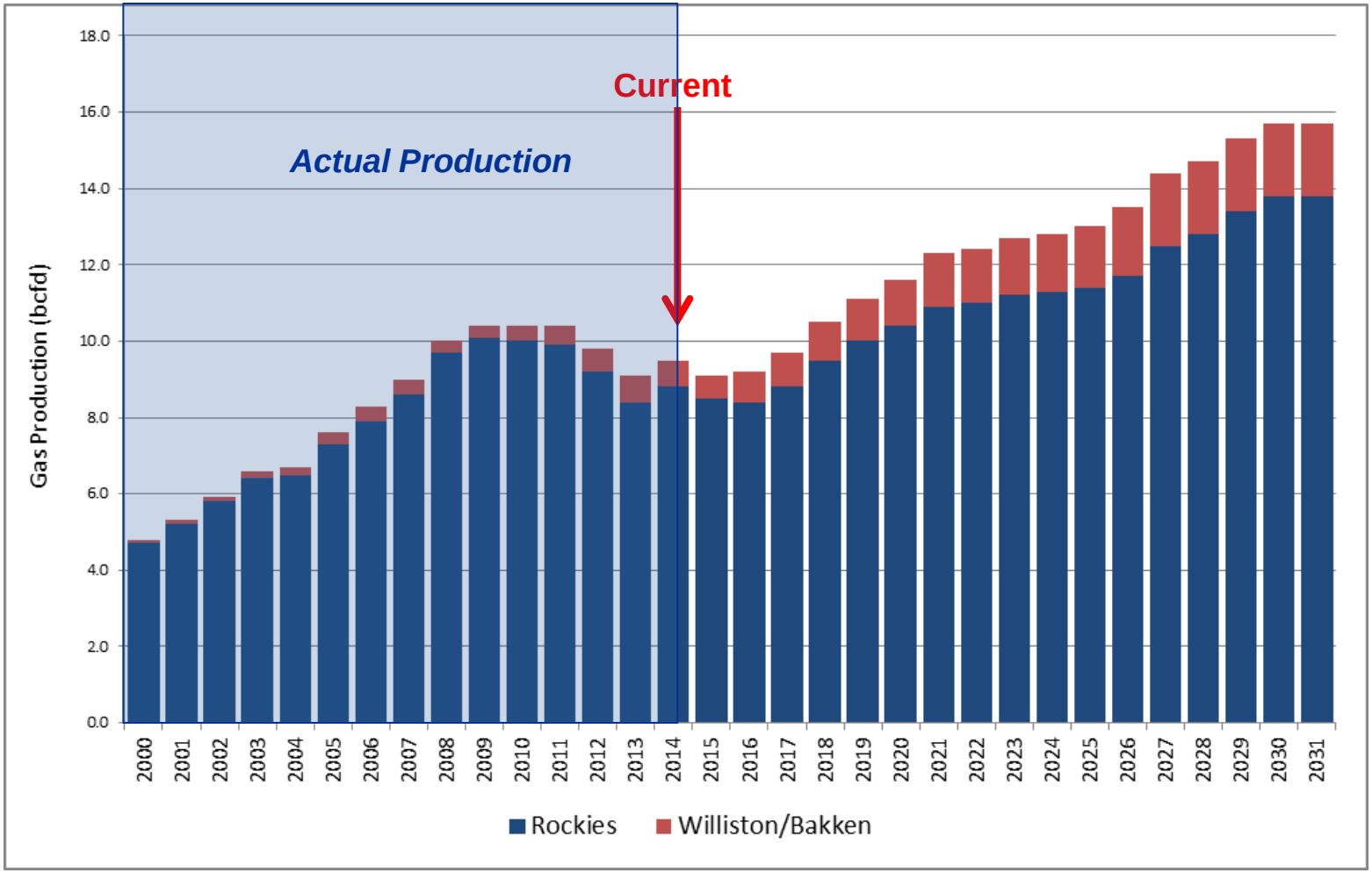
Rockies/Bakken Production – Historic & Forecast



Source: Wood-Mac - 2014

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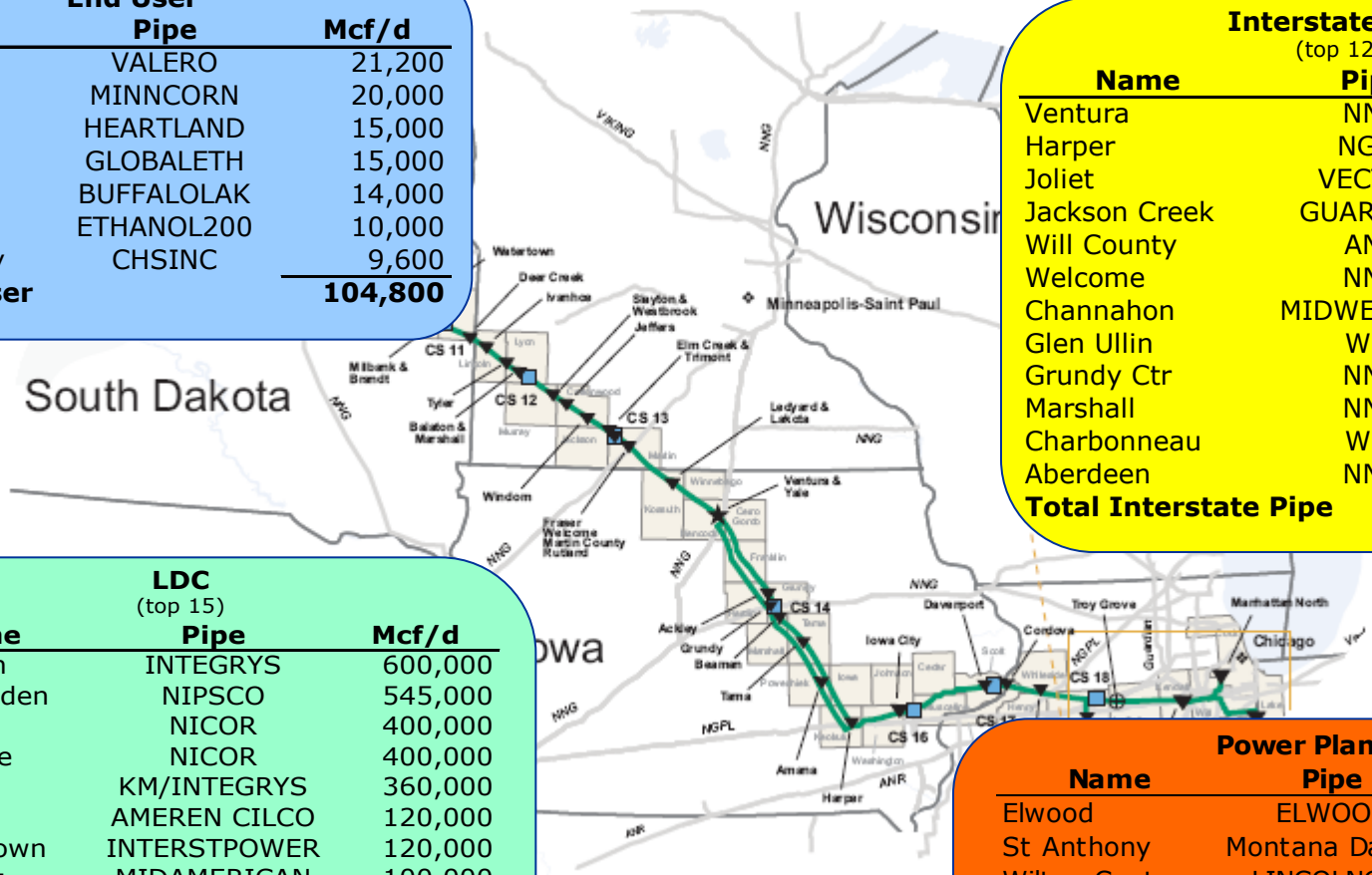
Northern Border - Major Markets

End User

Name	Pipe	Mcf/d
Fraser	VALERO	21,200
Balaton	MINNCORN	20,000
Davis	HEARTLAND	15,000
Lakota	GLOBALETH	15,000
Rutland	BUFFALOLAK	14,000
Windom	ETHANOL200	10,000
Martin County	CHSINC	9,600
Total End User		**104,800**



Interstate Pipe
(top 12)

Name	Pipe	Mcf/d
Ventura	NNG	2,200,000
Harper	NGPL	900,000
Joliet	VECTOR	700,000
Jackson Creek	GUARDIAN	650,000
Will County	ANR	500,000
Welcome	NNG	250,000
Channahon	MIDWESTERN	236,000
Glen Ullin	WBI	130,000
Grundy Ctr	NNG	103,000
Marshall	NNG	80,000
Charbonneau	WBI	60,000
Aberdeen	NNG	21,000
Total Interstate Pipe		**5,873,694**

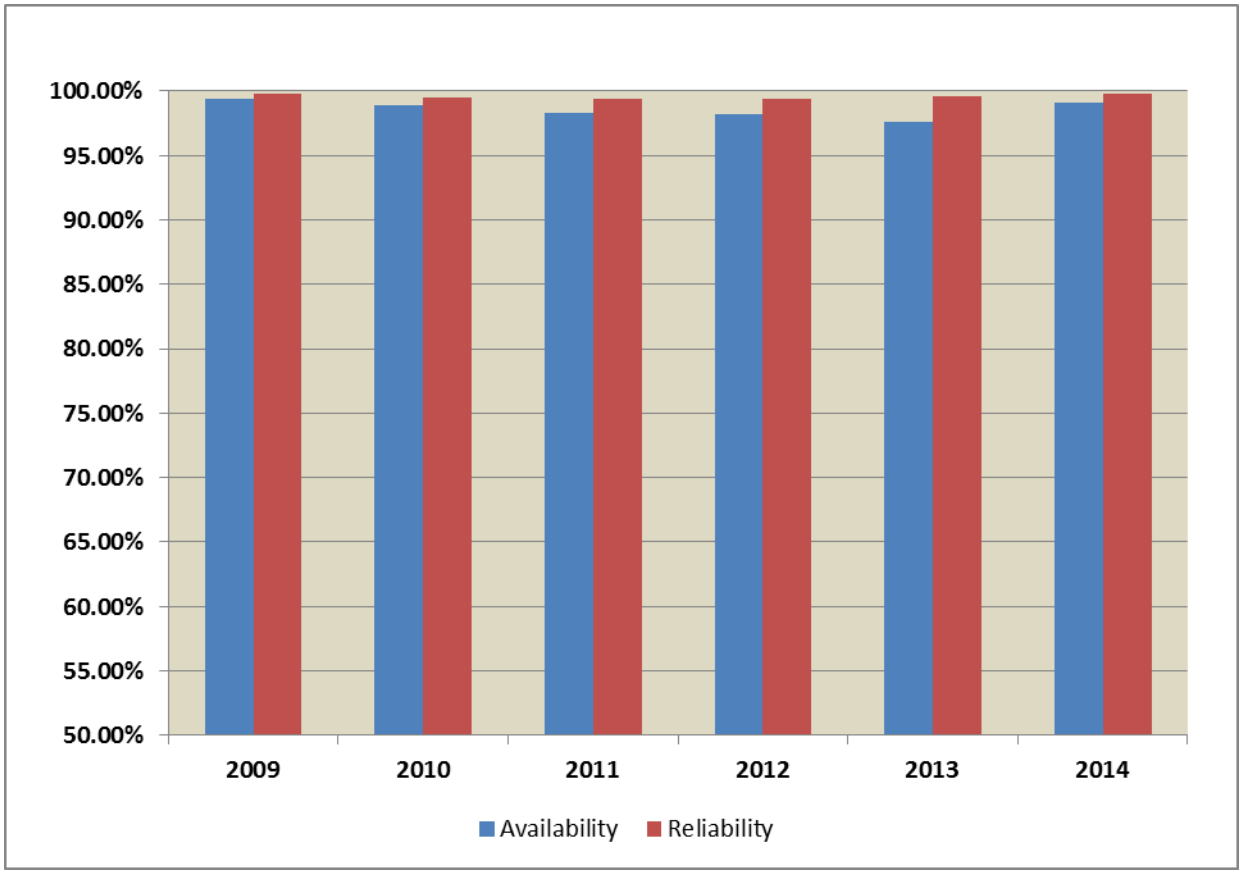
LDC
(top 15)

Name	Pipe	Mcf/d
Manhattan	INTEGRYS	600,000
North Hayden	NIPSCO	545,000
Minooka	NICOR	400,000
Troy Grove	NICOR	400,000
Torrence	KM/INTEGRYS	360,000
Princeton	AMEREN CILCO	120,000
Prophetstown	INTERSTPOWER	120,000
Davenport	MIDAMERICAN	100,000
Iowa City	MIDAMERICAN	100,000
Trimont	HUTCHINSON	60,000
Brandt	NWPUBLICSE	38,000
Warner	NWPUBLICSE	24,000
Watertown	CITY WATERT	22,000
Ackley	CONSUMER ENE	20,000
Total LDC		**3,554,570**

Power Plant

Name	Pipe	Mcf/d
Elwood	ELWOOD	420,000
St Anthony	Montana Dakota	200,000
Wilton Center	LINCOLNGEN	190,000
Elm Creek	GRERIVENER	180,000
Yale	INTERSTPOW	155,000
Lonesome Creek	BASINELEC	125,000
Deer Creek	BASINELEC	95,000
Cordova	MIDAMERICA	53,000
Groton	BASINELEC	46,000
Lanark	BASINELEC	46,000
Total Power Plant		**1,510,000**

Northern Border Average Unit Reliability



Availability = Percent of annual hours less scheduled and unscheduled outages
Reliability = Percent of annual hours less unscheduled outages

Source: Internal Analysis (1/20)

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Northern Border Pipeline - Recap
POM-Ventura Segment

- Modern, 1980's vintage, high-pressure gas pipeline
  - 1435 psig MAOP
  - 42" diameter
- Highly reliable, gas turbine-driven compression
  - 13 compressor stations – total horsepower = 458,000 HP
  - Rolls-Royce gas turbines
  - Heat Recovery – Electric Generation at 10 sites = 55 MW
- Access to multiple sources of supply
  - Canadian – WCSB
  - Bakken/Williston Basin
  - Rockies
  - Coal gasification plant
- Large amount of line-pack
  - Up to 5 Bcf of gas
  - Provides flexibility and reliability

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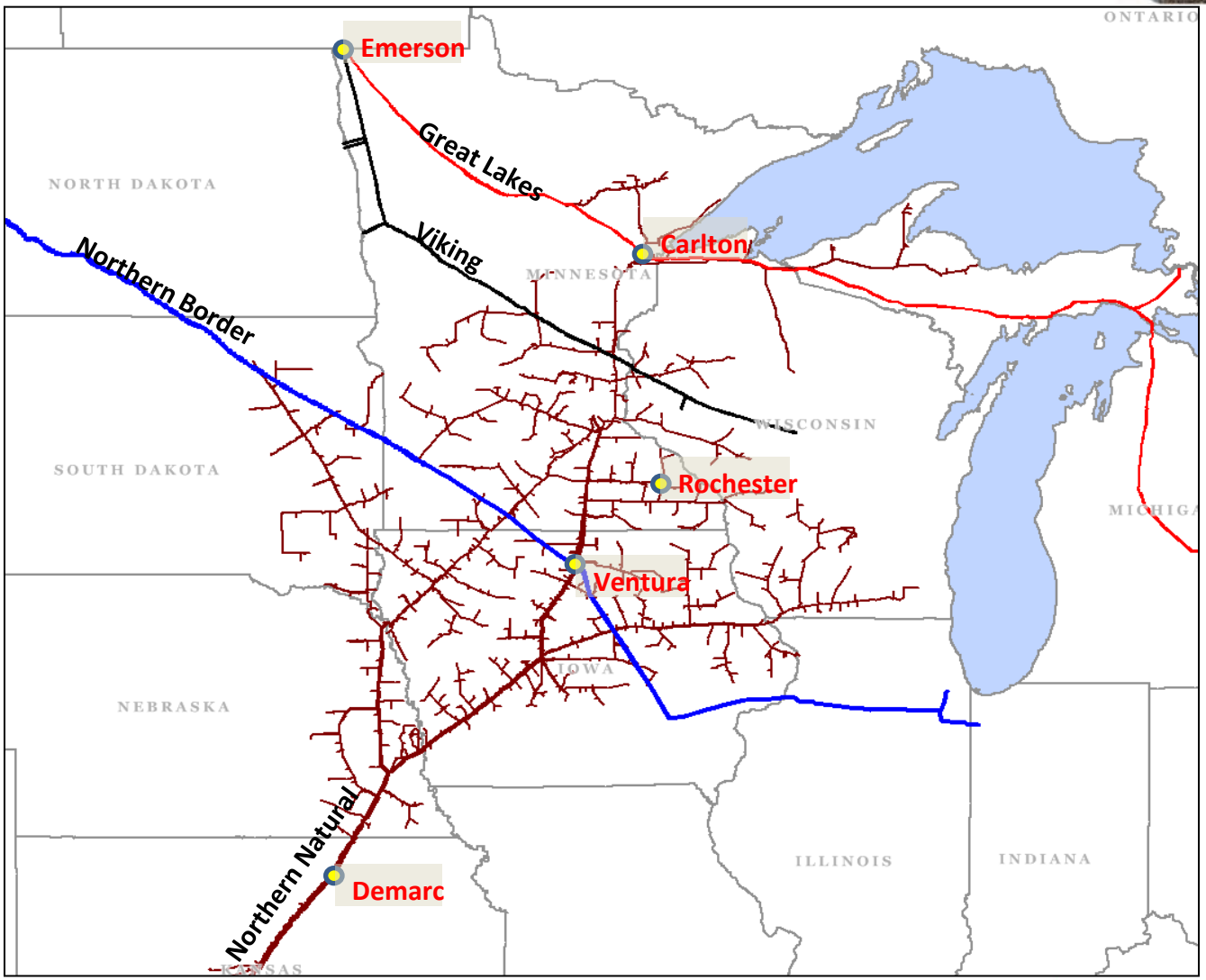
Interstate Pipelines Serving Minnesota



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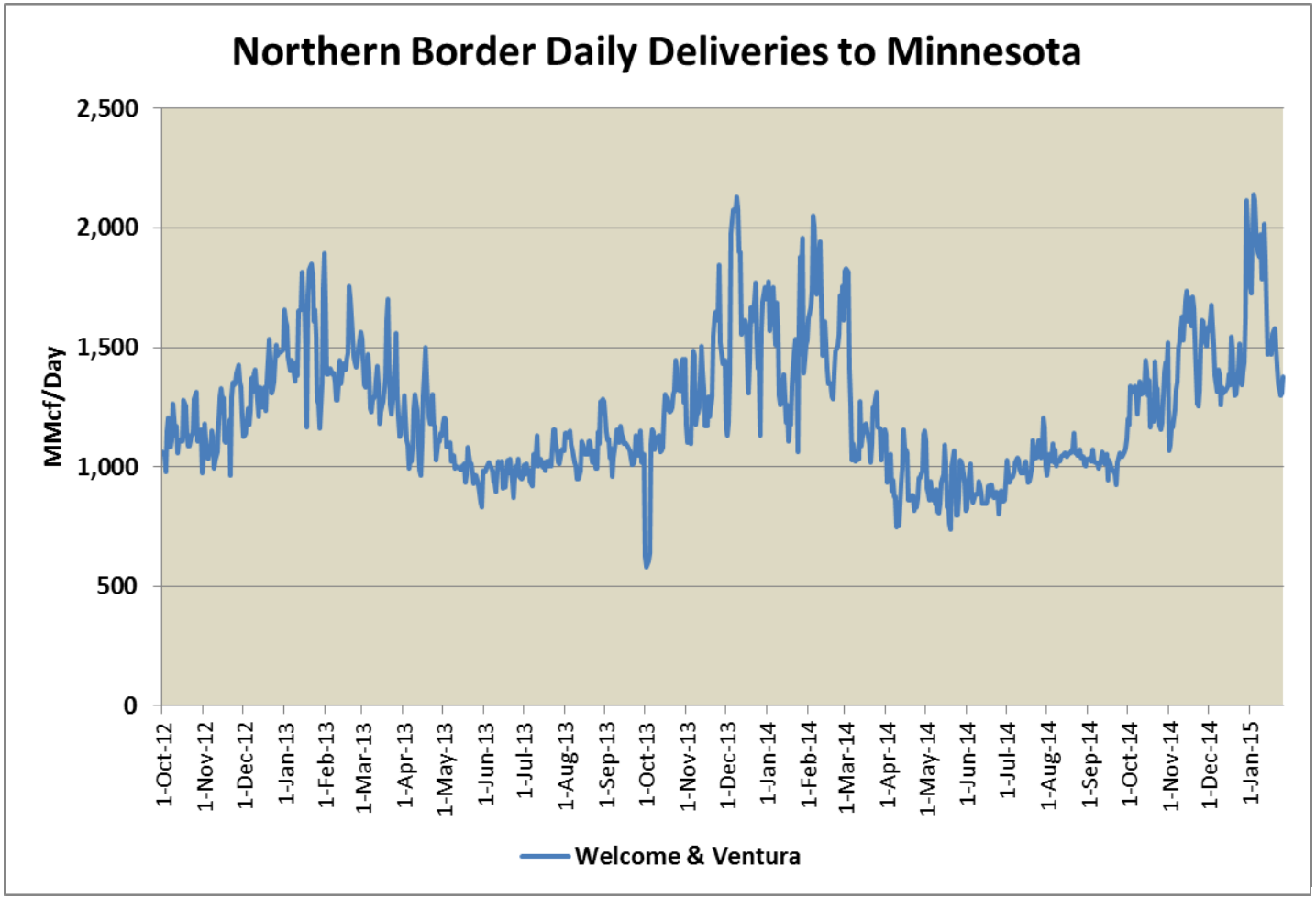
Deliveries into Minnesota Market via Northern Border



Source: Internal Analysis

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Minnesota Supply Diversity

Monthly Demand

Bison

Northern Border

Alliance (Wet Gas System)

GLGT

Viking

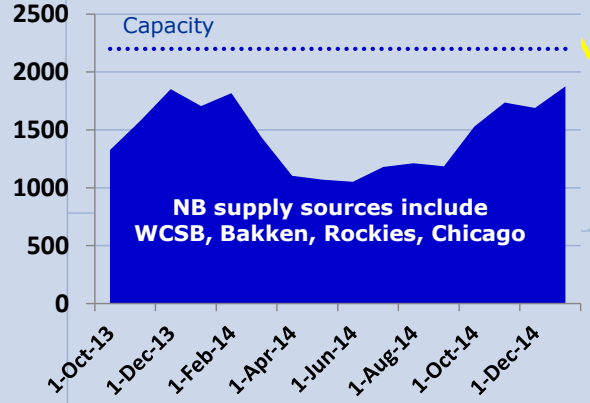
Northern Natural

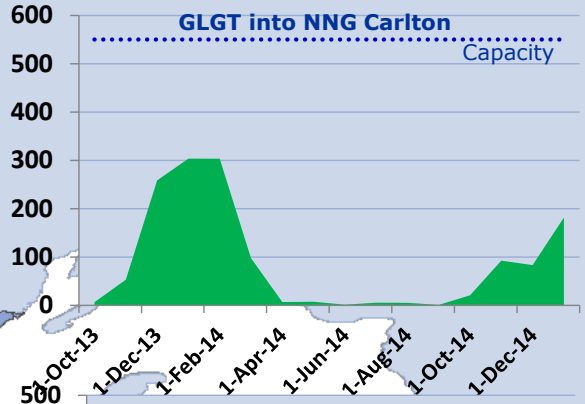
Emerson

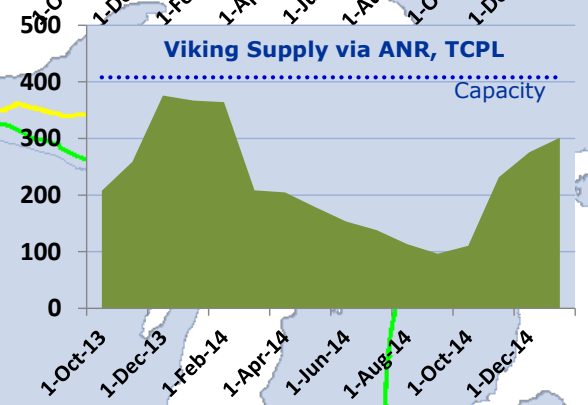
Carlton

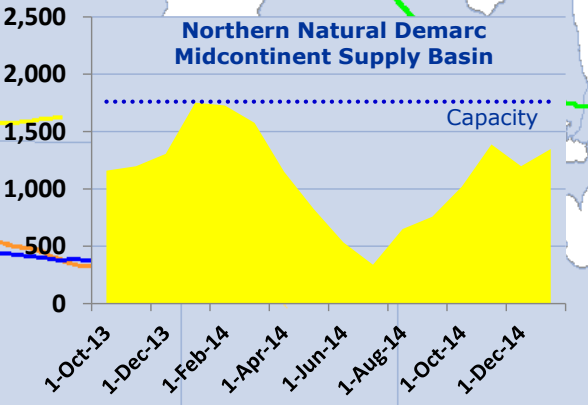
Ventura

Demarc

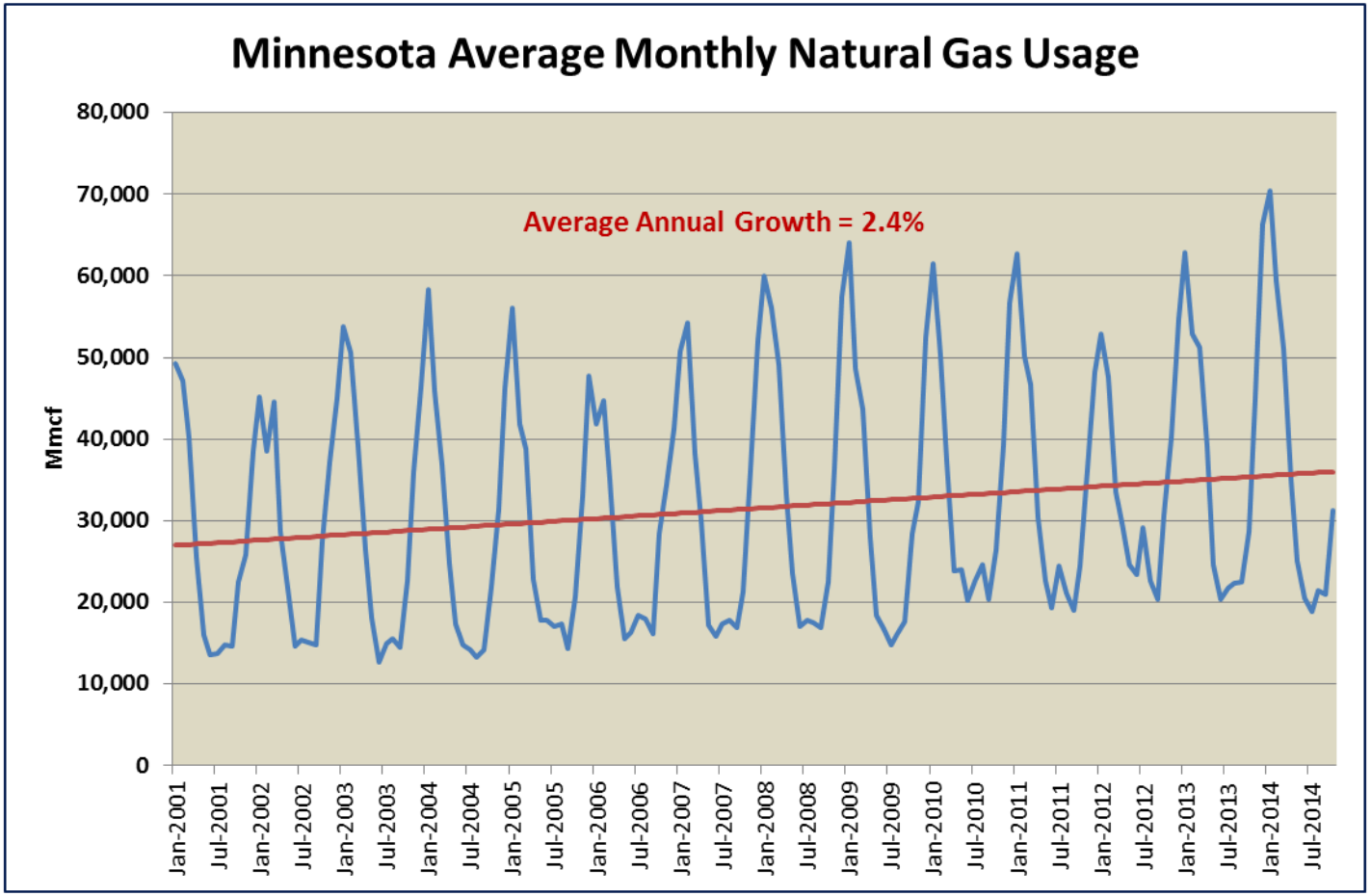








Minnesota Gas Market Growth



Source: EIA, Internal Analysis

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Growth Drivers for Minnesota Gas Market

- GDP expected to grow at higher than the national average.
- Current recovery is broad-based in state attracting business and workers.
- Minneapolis population expected to increase by 800,000 by 2040.
- Projected investment of $6 billion in the Mayo Clinic to expand its medical assets and staff in Rochester area.
- Gas-fired electric generation expected to continue to grow in support alternative energy and to replace coal generation.

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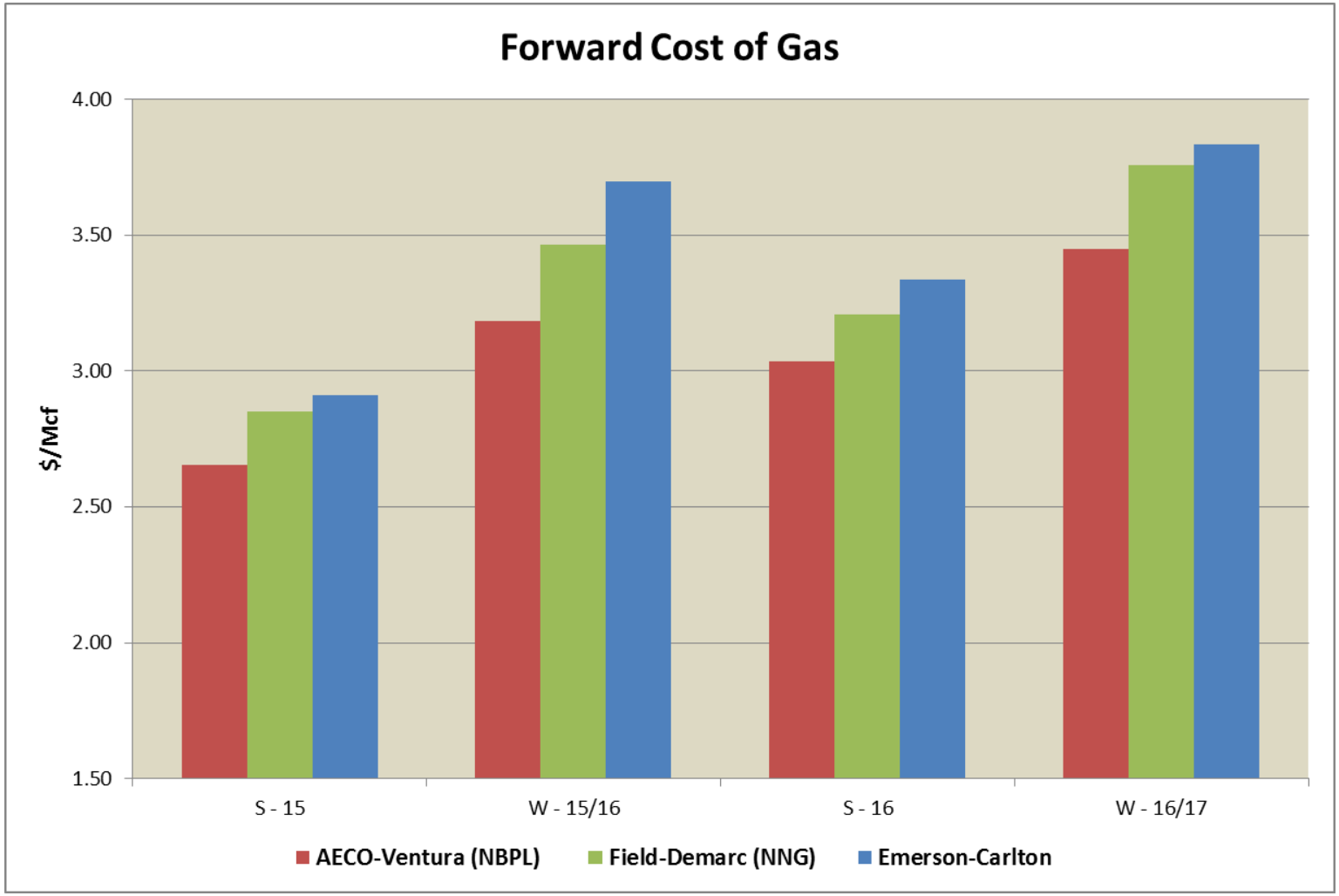
Future Gas Cost Comparison



Source: Internal Analysis (1/20)

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Historical Temperature, SOL and Carlton Days

System Weight Temp vs Normal						
	09-10	10-11	11-12	12-13	13-14	
November	26%	3%	12%	4%	15%	
December	8%	8%	16%	6%	21%	
January	5%	5%	16%	1%	21%	
February	8%	6%	12%	6%	33%	
March	17%	9%	47%	29%	30%	
Heating Season	2%	5%	19%	4%	24%	

Warmer than Normal
Colder than Normal

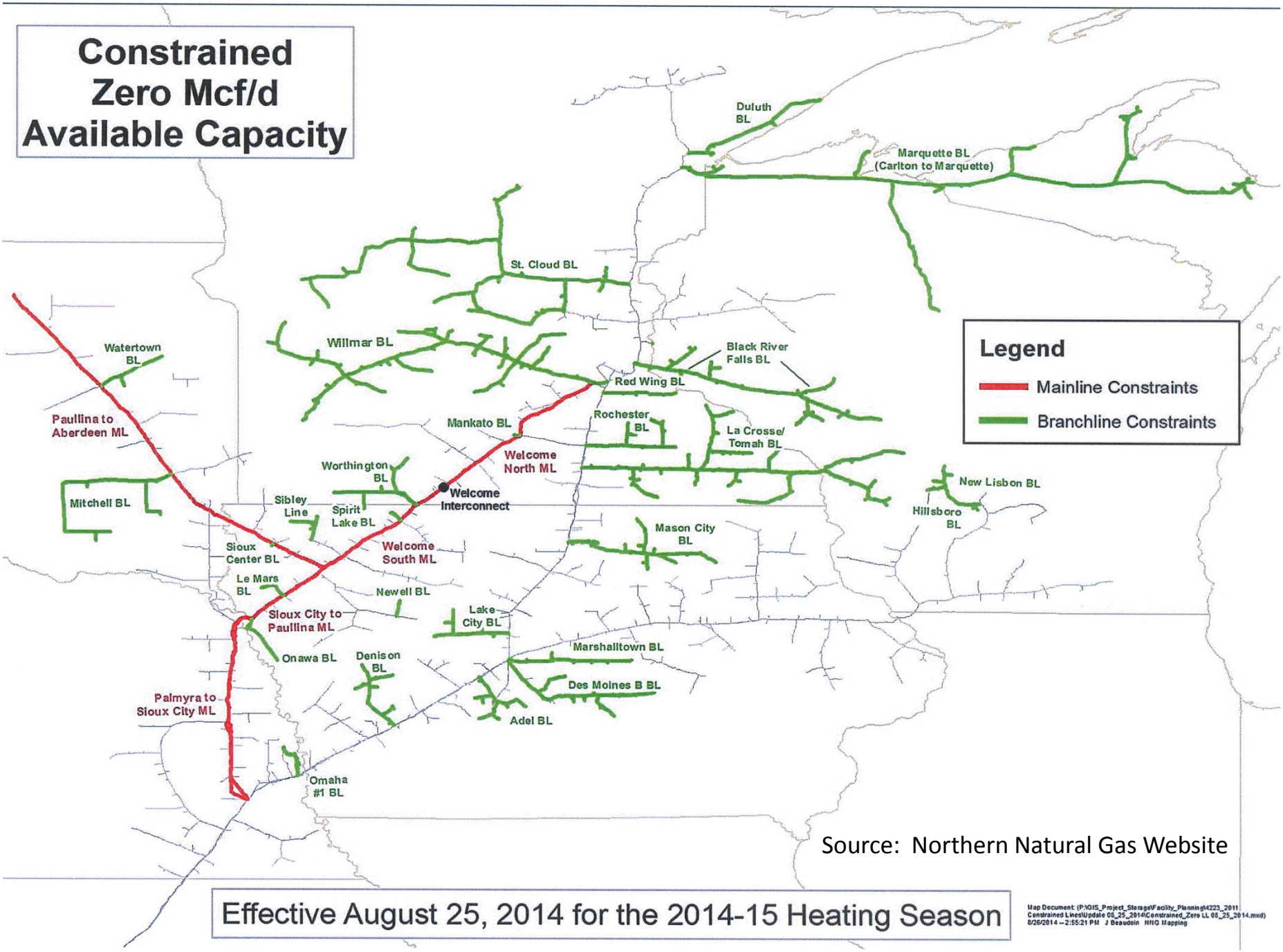
Record 2013-2014 weather and throughput correlates with SOL and Carlton requirements

SOL						
	09-10	10-11	11-12	12-13	13-14	Average
November	0	0	0	0	0	0
December	6	7	0	11	17	8
January	11	19	2	12	26	14
February	2	15	4	1	27	9
March	0	1	0	0	6	2
Total for Heating Season	19	42	6	24	76	23

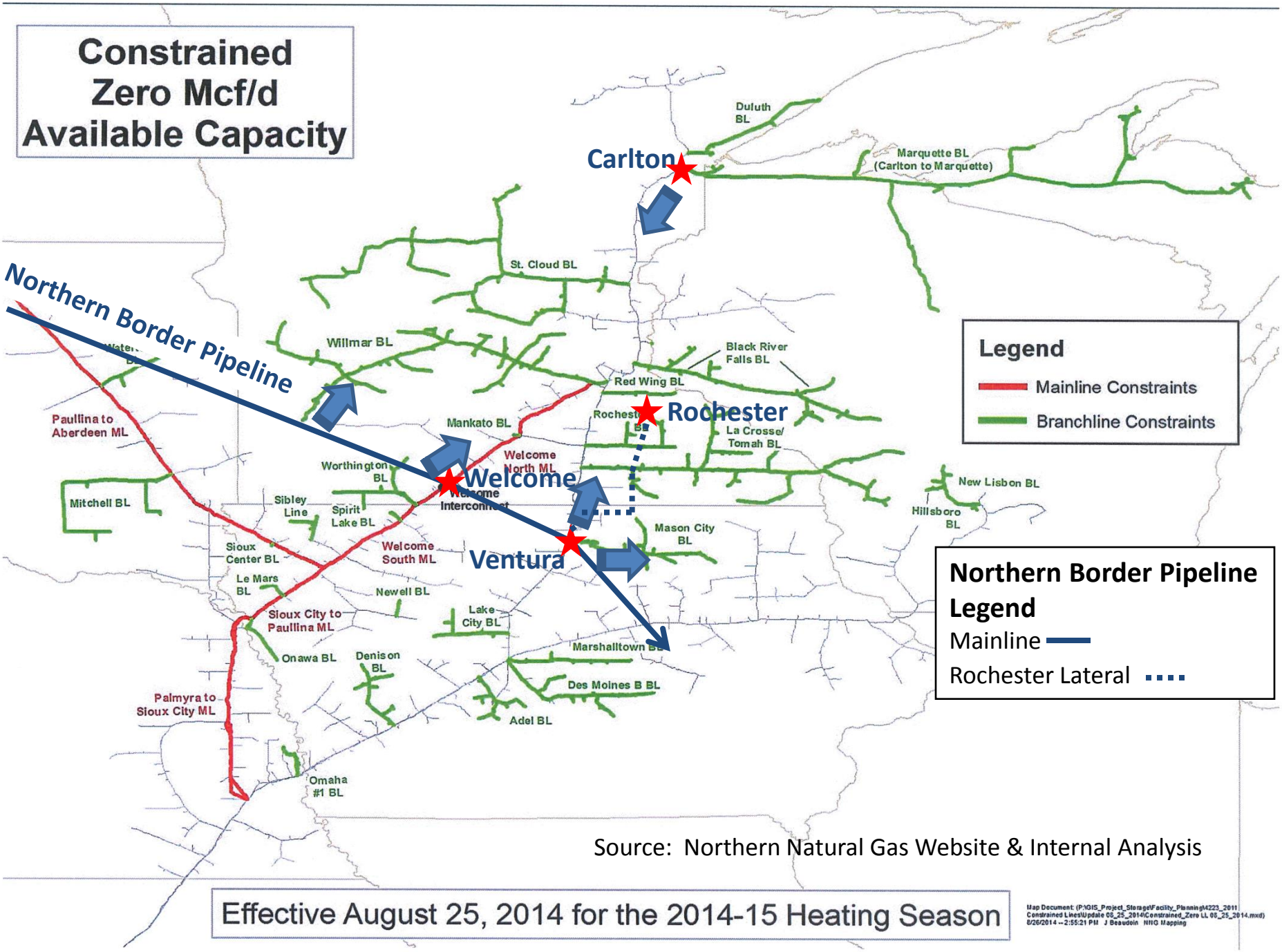
SOL/Critical Days: To balance receipts with deliveries to ensure pipeline integrity

Carlton Resolution						
	09-10	10-11	11-12	12-13	13-14	Average
November	0	0	0	1	0	2
December	22	17	0	16	20	18
January	15	30	4	23	25	21
February	17	23	7	8	27	18
March	0	13	0	3	8	6
Total for Heating Season	54	83	11	51	80	62

Carlton flow requirements: To support north Market Area deliveries


Constrained
Zero Mcf/d
Available Capacity
Duluth BL
Marquette BL (Carlton to Marquette)
St. Cloud BL
Willmar BL
Watertown BL
Black River Falls BL
Red Wing BL
Paullina to Aberdeen ML
Mankato BL
Rochester BL
La Crosse/ Tomah BL
Welcome North ML
Worthington BL
Welcome Interconnect
Mitchell BL
Sibley Line
Spirit Lake BL
New Lisbon BL
Hillsboro BL
Mason City BL
Sioux Center BL
Welcome South ML
Le Mars BL
Newell BL
Sioux City to Paullina ML
Lake City BL
Onawa BL
Denison BL
Marshalltown BL
Des Moines B BL
Palmyra to Sioux City ML
Adel BL
Omaha #1 BL
Legend
Mainline Constraints
Branchline Constraints
Source: Northern Natural Gas Website
Effective August 25, 2014 for the 2014-15 Heating Season
Map Document: (P:\GIS_Project_Storage\Facility_Planning\4223_2011 Constrained Lines\Update 08_25_2014\Constrained_Zero LL 08_25_2014.mxd)
8/26/2014 -- 2:55:21 PM J Beaudoin NNG Mapping

Constrained Zero Mcf/d Available Capacity

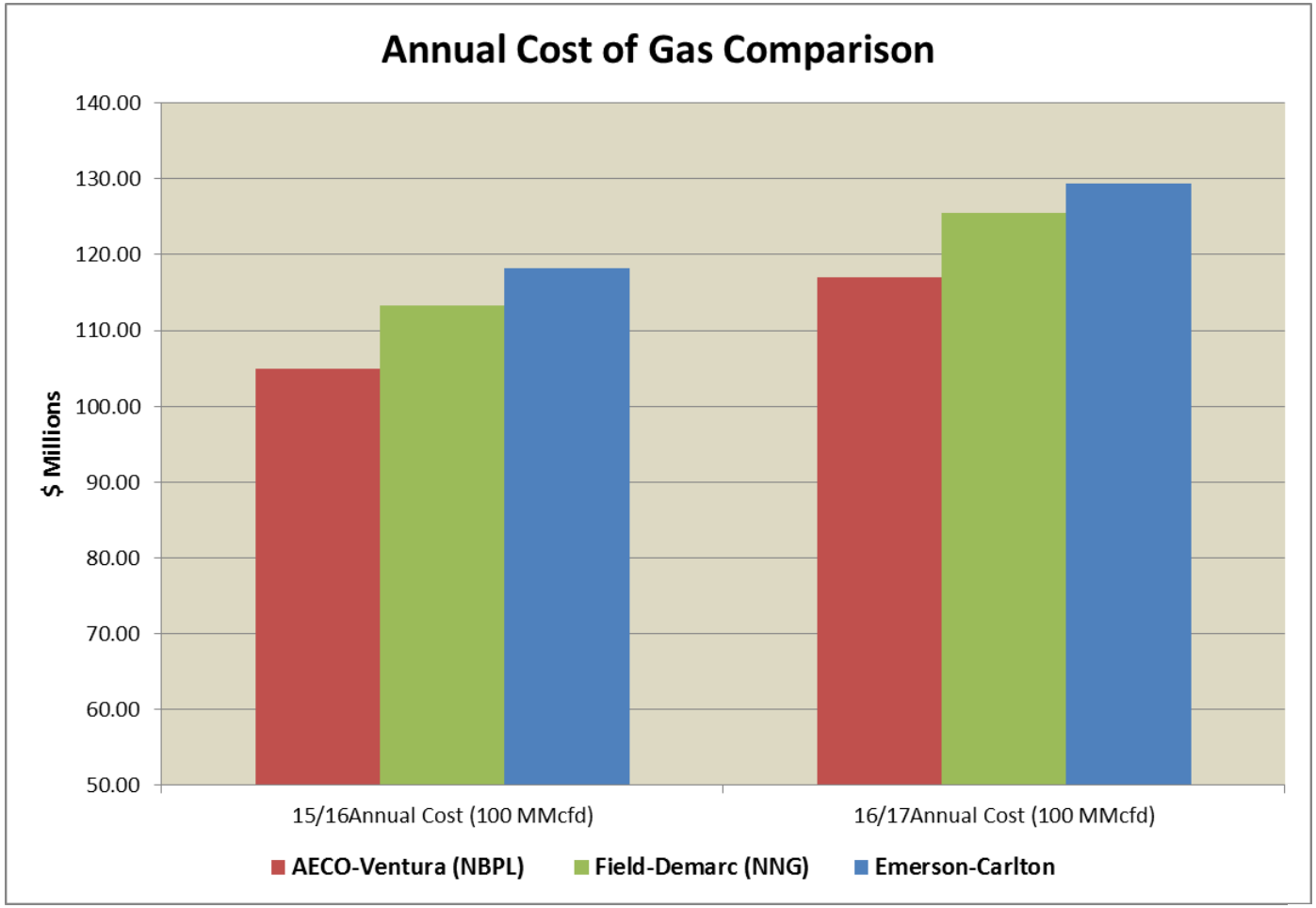


Source: Northern Natural Gas Website & Internal Analysis

Effective August 25, 2014 for the 2014-15 Heating Season

Map Document: (P:\GIS_Project_Storage\Facility_Planning\4223_2011 Constrained Lines\Update 08_25_2014\Constrained_Zero LL 08_25_2014.mxd) 8/26/2014 -- 2:55:21 PM J Beaudoin NNG Mapping

Future Annual Gas Cost Comparison



Annual Cost of 100,000 Mcf/Day @ 100% Load Factor

Source: Internal Analysis (1/20)

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Minnesota – Gas Infrastructure shortage

- During peak usage, existing gas infrastructure is unable to meet 100% of customer demand without commercial intervention / limitations
- Forecast growth will only exacerbate this situation, further reducing reliability and flexibility while increasing reliance on higher cost supply

- Solution – new pipeline infrastructure to;
  - accommodate growth
  - reduce / eliminate system constraints
  - improve reliability

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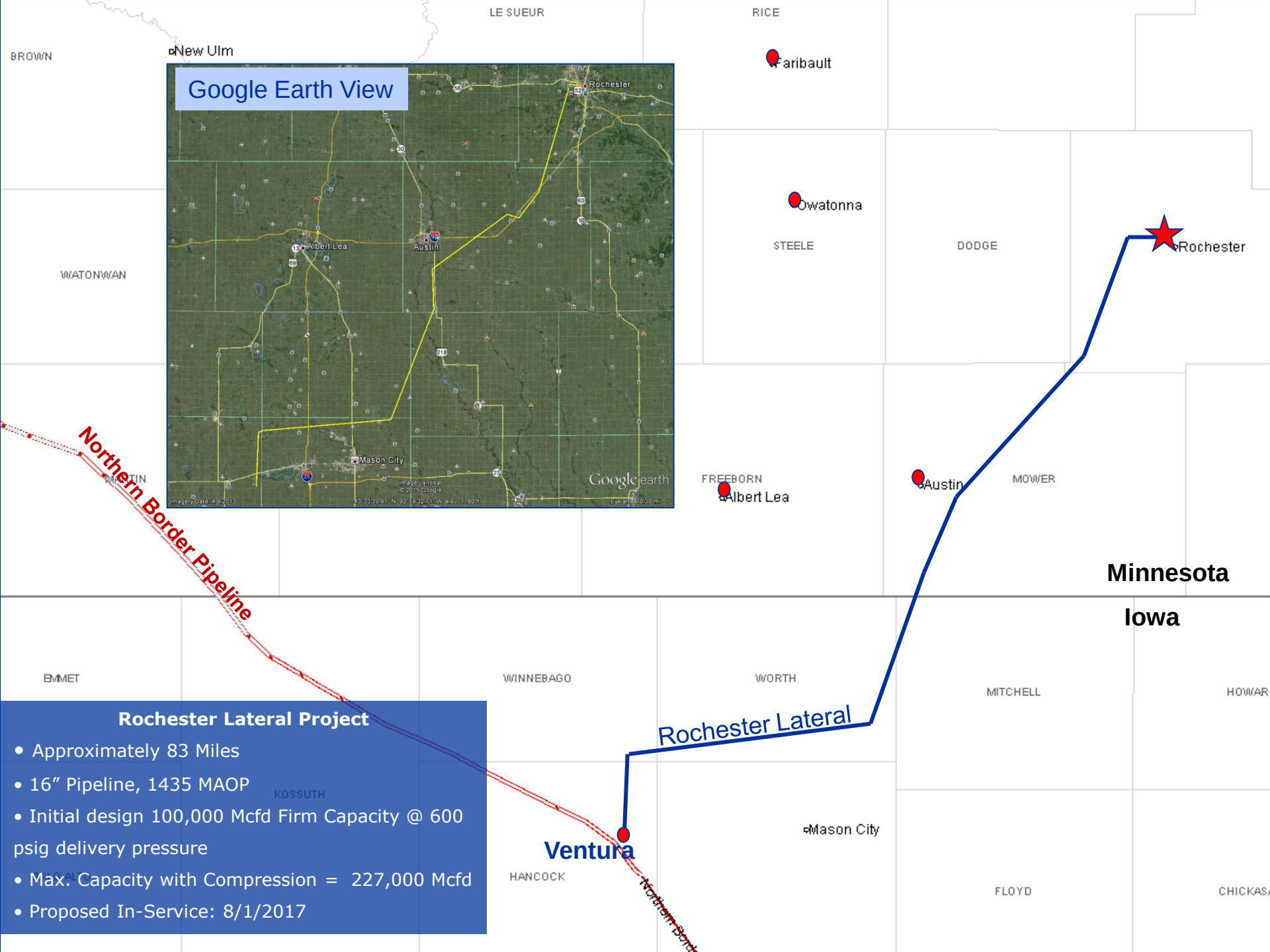

Rochester Lateral Project

- Approximately 83 Miles
- 16" Pipeline, 1435 MAOP
- Initial design 100,000 Mcfd Firm Capacity @ 600 psig delivery pressure
- Max. Capacity with Compression = 227,000 Mcfd
- Proposed In-Service: 8/1/2017

Rochester Lateral Project Schedule

Task Name	Duration	Start	Finish
Rochester Lateral Project	**632 days**	**Mon 3/2/15**	**Tue 8/1/17**
Project Governance	**423 days**	**Mon 3/2/15**	**Wed 10/26/16**
Procurement of long lead items	**273 days**	**Fri 12/18/15**	**Mon 1/16/17**
Pre-Construction Surveys	**221 days**	**Wed 4/8/15**	**Fri 2/19/16**
Land & Title Search based on draft pipeline route	20 days	Wed 4/8/15	Tue 5/5/15
Acquire survey permission	45 days	Mon 4/13/15	Mon 6/15/15
Preliminary Surveys	**40 days**	**Mon 5/4/15**	**Mon 6/29/15**
Final Surveys	**20 days**	**Mon 1/25/16**	**Fri 2/19/16**
FERC Pre-filing	**158 days**	**Wed 7/8/15**	**Fri 2/19/16**
Federal and State Permits	**120 days**	**Tue 11/24/15**	**Fri 5/13/16**
Federal	**120 days**	**Tue 11/24/15**	**Fri 5/13/16**
State	**120 days**	**Tue 11/24/15**	**Fri 5/13/16**
FERC	**200 days**	**Fri 2/19/16**	**Fri 12/2/16**
Engineering	**309 days**	**Wed 3/4/15**	**Wed 5/18/16**
FEED	**88 days**	**Wed 3/4/15**	**Tue 7/7/15**
Pipeline and Interconnect Detailed Engineering	**134 days**	**Tue 10/27/15**	**Thu 5/5/16**
Meter Station Detailed Engineering	**284 days**	**Wed 4/8/15**	**Wed 5/18/16**
Skids Fabrication Process (EGM, Metering, Filter Separator, pig traps)	**144 days**	**Fri 9/23/16**	**Tue 4/18/17**
Construction Bid Process	**38 days**	**Fri 9/23/16**	**Tue 11/15/16**
Pipeline	**35 days**	**Wed 9/28/16**	**Tue 11/15/16**
Meter Station & Interconnect	**30 days**	**Fri 9/23/16**	**Thu 11/3/16**
Construction	**153 days**	**Tue 12/27/16**	**Mon 6/26/17**
Pipeline	**129 days**	**Tue 12/27/16**	**Sat 5/27/17**
Meter Station & Interconnect	**88 days**	**Wed 3/15/17**	**Mon 6/26/17**
Commissioning	**30 days**	**Tue 6/27/17**	**Tue 8/1/17**
In-Service	**0 days**	**Tue 8/1/17**	**Tue 8/1/17**

Project: Rochester Lateral Prelimi
Date: Fri 1/30/15

Task		Project Summary		Inactive Milestone		Manual Summary Rollup		Deadline	
Split		External Tasks		Inactive Summary		Manual Summary		Critical	
Milestone		External Milestone		Manual Task		Start-only		Critical Split	
Summary		Inactive Task		Duration-only		Finish-only		Progress	

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NBPL Rochester Lateral - Advantages

- New pipe, modern construction, high pressure
- Dedicated infrastructure into Minnesota
- Capacity for existing and future load requirements
  - Initial capacity = 110 Mmcf/Day
  - Maximum pipeline capacity = 227 Mmcf/Day
  - Platform enables future growth in Rochester and Minnesota
- No pipeline constraints or bottlenecks that reduce flexibility or constrain growth
- No lateral compression - 0% fuel cost, best possible reliability
- Provides economically competitive infrastructure into Rochester market, while increasing reliability and flexibility for all Minnesota gas infrastructure
- Connection to Ventura via Northern Border provides flexibility for supply options – either Ventura or from one of three supply basins to ensure availability of supply at the lowest cost

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NBPL Contacts

Todd Johnson – Director of Business Development

todd_r_johnson@transcanada.com

832.320.5724

Bill Fonda – Manager, Business Development

bill_fonda@transcananda.com

402.492.7430

Dick Shepherd – Account Director, Business Development

richard_shepherd@transcanada.com

402.792.7431

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