



**Blue Source**

A Leading Climate Change Portfolio

# Carbon Pipeline Infrastructure

## Today and Tomorrow

CONFIDENTIAL - Subject to NDA



# Current CO2 Pipeline Regulatory Structure

- Regulatory Lead is by US Department of Transportation's
  - Office of Pipeline Safety
- States May Regulate Under a Partnership Agreement with OPS
- Regulatory Framework is structured to:
  - Assure Safety in:
    - Pipeline Design
    - Construction
    - Testing
    - Operations and Maintenance

# Standards for Pipeline Materials & Construction

- American Petroleum Institute (API)
- American Gas Association (AGA)
- American Society for Testing and Materials (ASTM)

# Current CO<sub>2</sub> Sources & Pipelines



# North American CO2 Pipelines

• Pipeline	Owner/Operator	Length/Diameter	MaxCapacity	Location
		miles/inches	MMSCF/D	
• Anton Irish	Occidental Pet	40 / 8	75	TX
• Bravo	Occidental Pet	218 / 20	400	NM & TX
• Cayon Reef Carrier	Kinder Morgan	139 / 16	256	TX
• Centerline	Kinder Morgan	113 / 16	256	TX
• Central Basin	Kinder Morgan	143 / 26-16	256	TX
• Chaparral	Chaparral Energy	23 / 6	42	OK
• Choctaw	Denbury Resources	183 / 20	400	MS & LA
• Cordon Lake	XTO	7 / 6	42	TX
• Cortez	Kinder Morgan	502 / 30	1,100	CO,NM,TX
• DGC	Dakota Gasification	205 / 14-12	225	ND&Sask
• Dollarhide	Pure Energy	23 / 8	75	TX
• El Mar	Kinder Morgan	35 / 6	42	TX
• Enid –Purdy	Anadarko Pet	117 / 8	75	OK
• Este	ExxonMobil	85 /14-12	225	TX
• Ford	Kinder Morgan	12 / 4	20	TX

# North American CO2 Pipelines

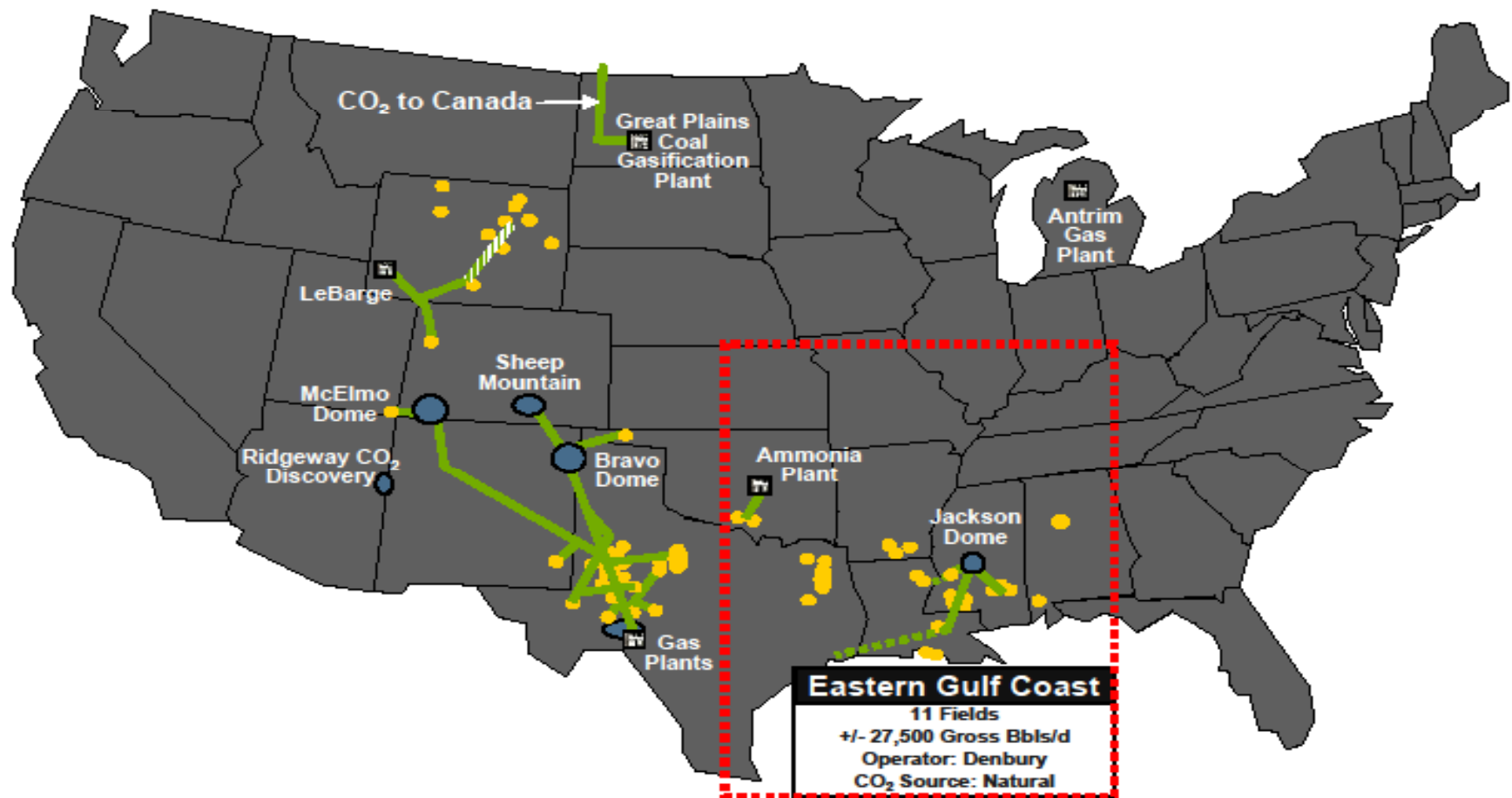
• Pipeline	Owner/Operator	Length/Diameter miles/inches	MaxCapacity MMSCF/D	Location
• Joffre Viking	Penn West Pet	8 / 6	42	Alberta
• Llano	Trinity CO2	53 / 12-8	165	TX
• Pecos County	Kinder Morgan	20 / 8	75	TX
• Piles Peak	Petro Source	40 / 8	75	TX
• Powder River Basin	Anadarko Pet	125 / 16	256	WY
• Raven Ridge	Chevron	160 / 16	256	WY & CO
• Sheep Mountain	Oxy/ExxonMobil	408 / 24	640	CO,NM,TX
• Shute Creel	ExxonMobil	30 / 30	1,100	WY
• Slaughter	Occidental Pet	35 /12	165	TX
• Transpetco	Trans Petco	110 / 8	75	TX & OK
• Val Verde	Petro Source	83 / 10	115	TX
• West Texas	Trinity CO2	60 /16-8	165	NM & TX
• Wellman	Petro Source	25 / 6	42	TX
• White Frost	Core Energy	11 / 6	42	MI
• Wyoming CO2	ExxonMobil	112 / 20-16	400	WY

# Permian Basin CO2 Pipeline System



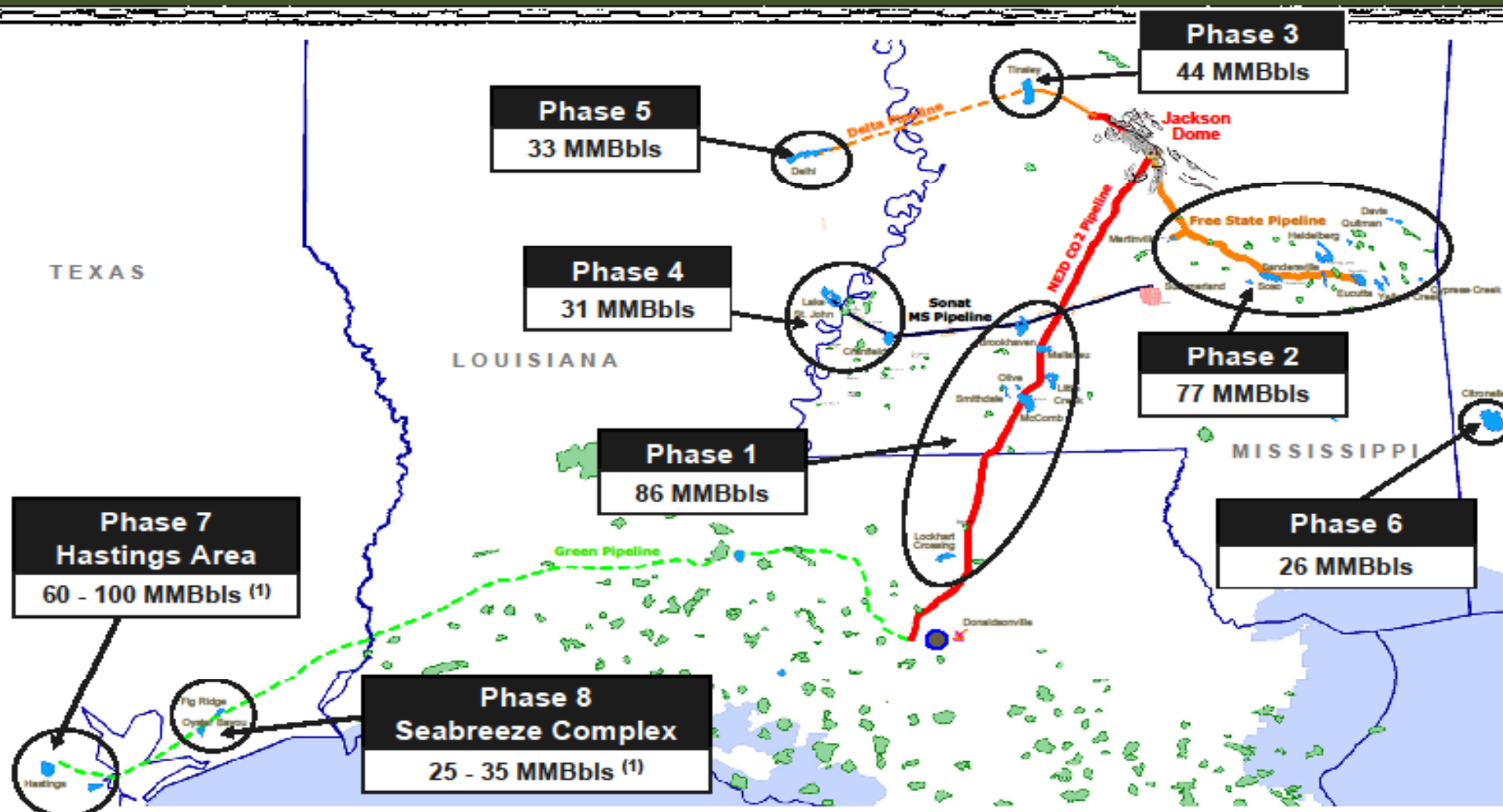
# Eastern Gulf Coast Pipeline Development

## Current CO<sub>2</sub> Sources & Pipelines





CO<sub>2</sub> Projects - Total Potential Tertiary Oil Reserves<sup>(1)</sup>



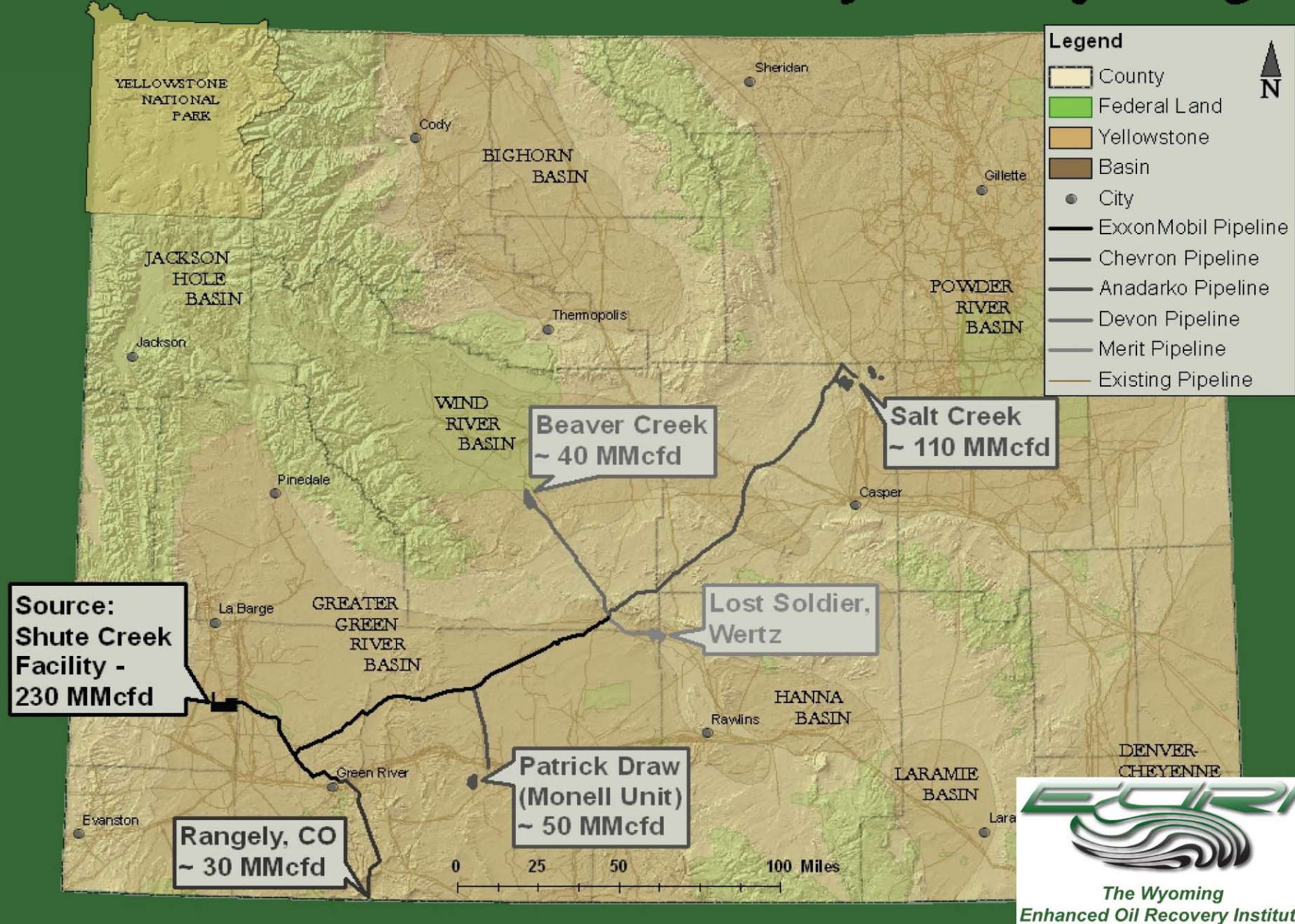
(1) Proved plus probable tertiary oil reserves as of 12/31/08, including past production, based on a range of recovery factors. Hastings Field was purchased 2/2/09.

Denbury Resources Inc. 9

[illegible]

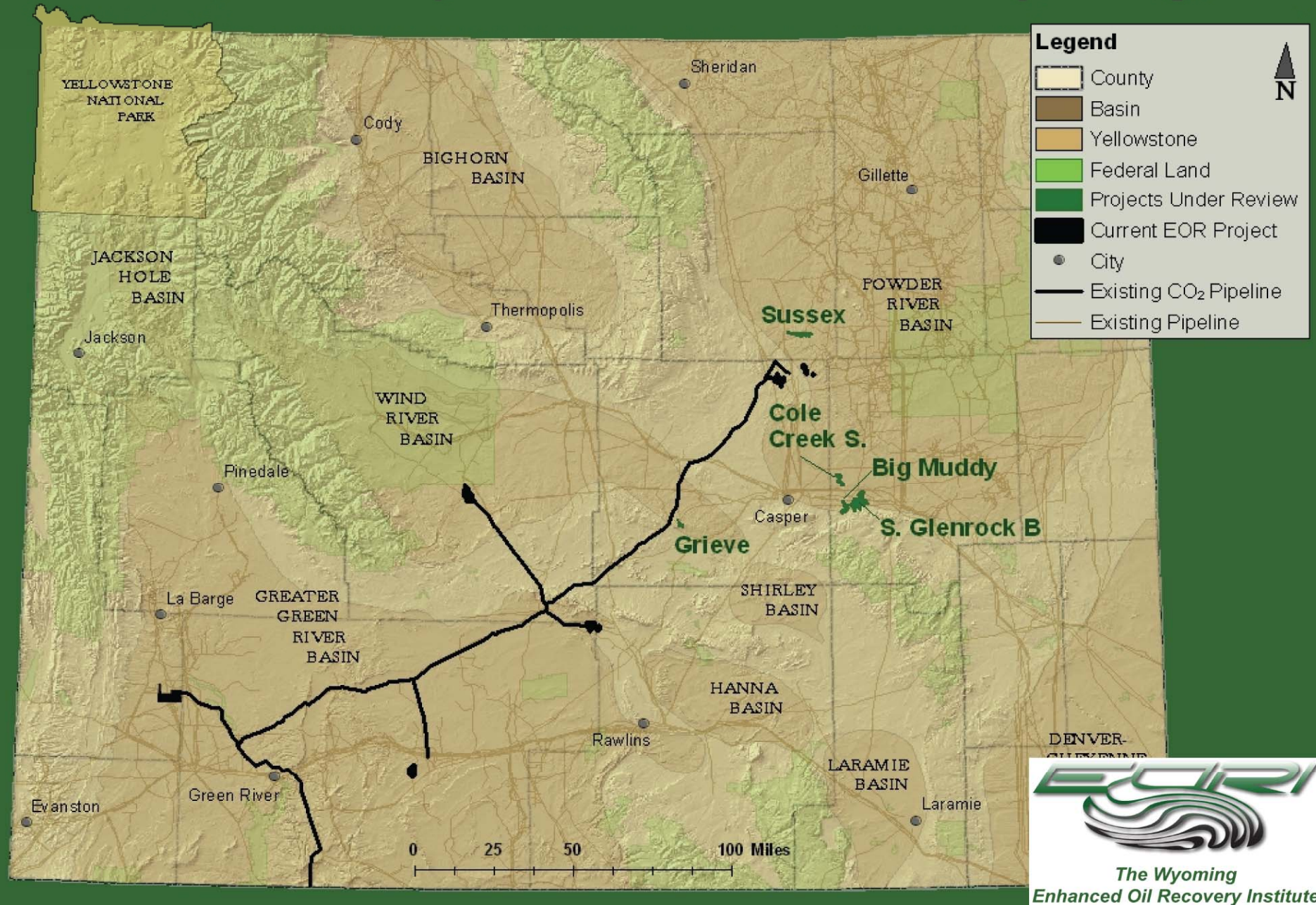


# Present CO<sub>2</sub> EOR Sources and Projects in Wyoming





# CO<sub>2</sub> EOR Projects Under Review in Wyoming





# Developing CO<sub>2</sub> Sources in Wyoming

## Refined Energy Holdings

2011-12  
~ 80 MMcfd

2014-15  
~ 175 MMcfd

## GasTech, Inc.

2013  
~ 115 MMcfd

## ConocoPhillips

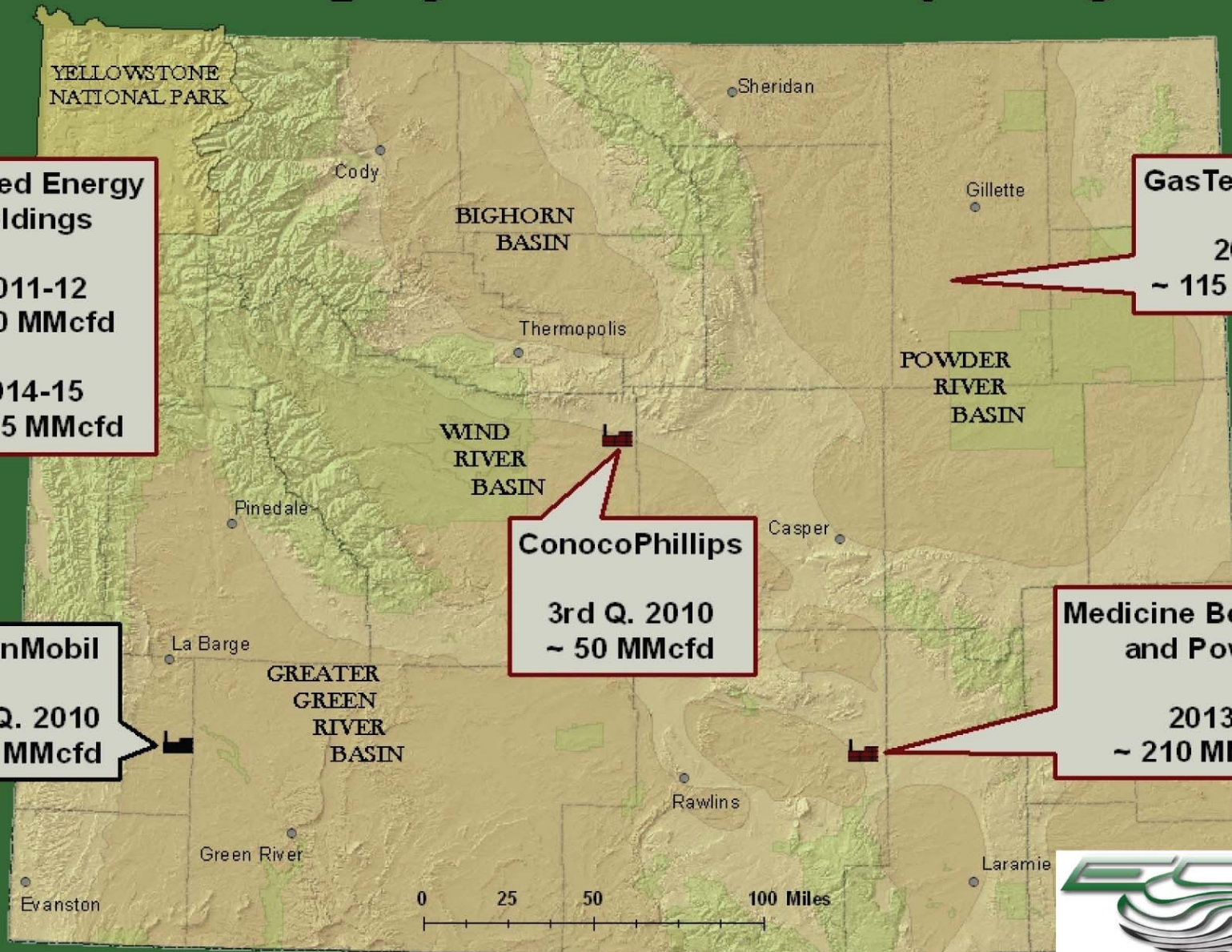
3rd Q. 2010  
~ 50 MMcfd

## Medicine Bow Fuel and Power

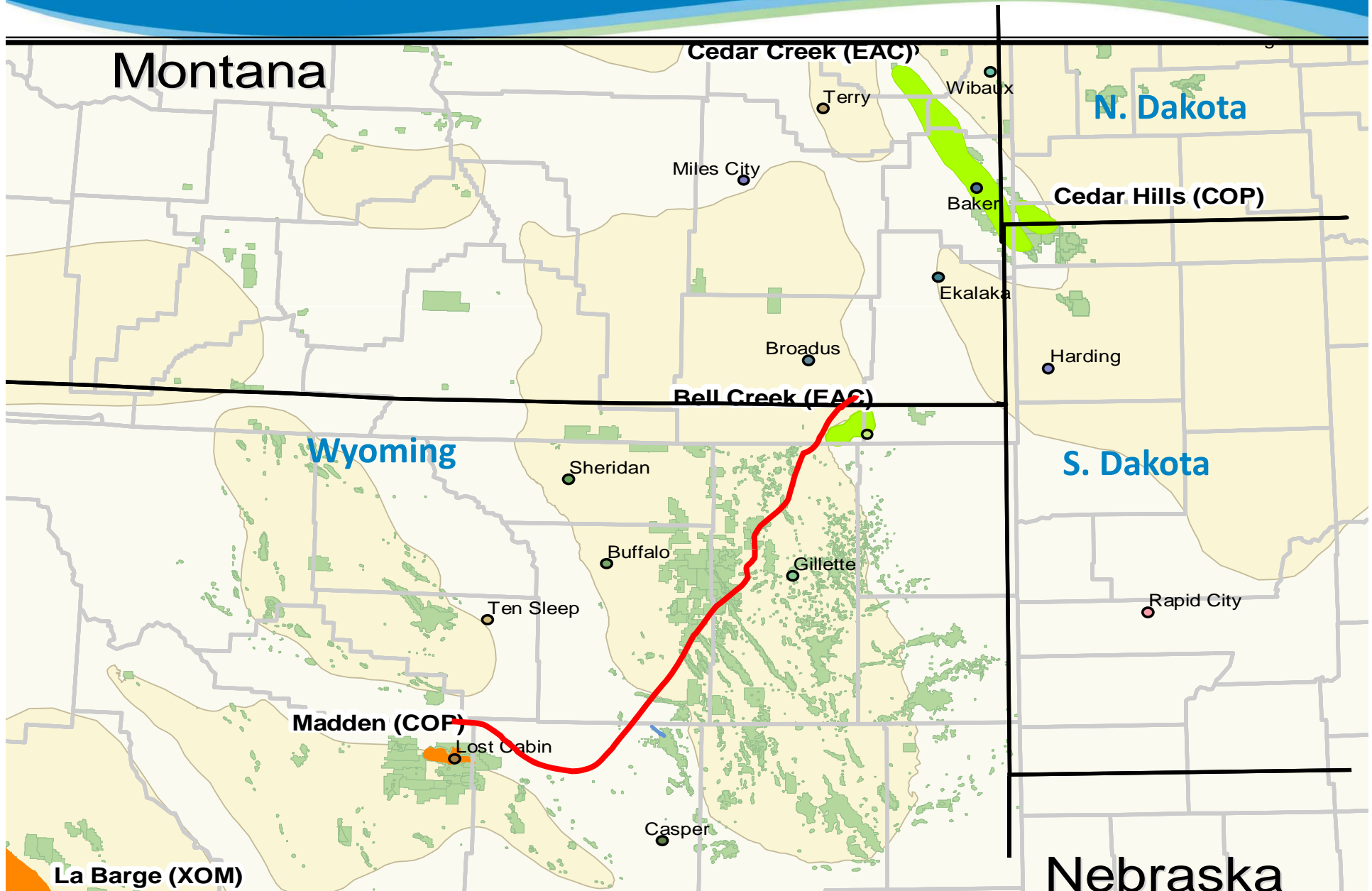
2013  
~ 210 MMcfd

## ExxonMobil

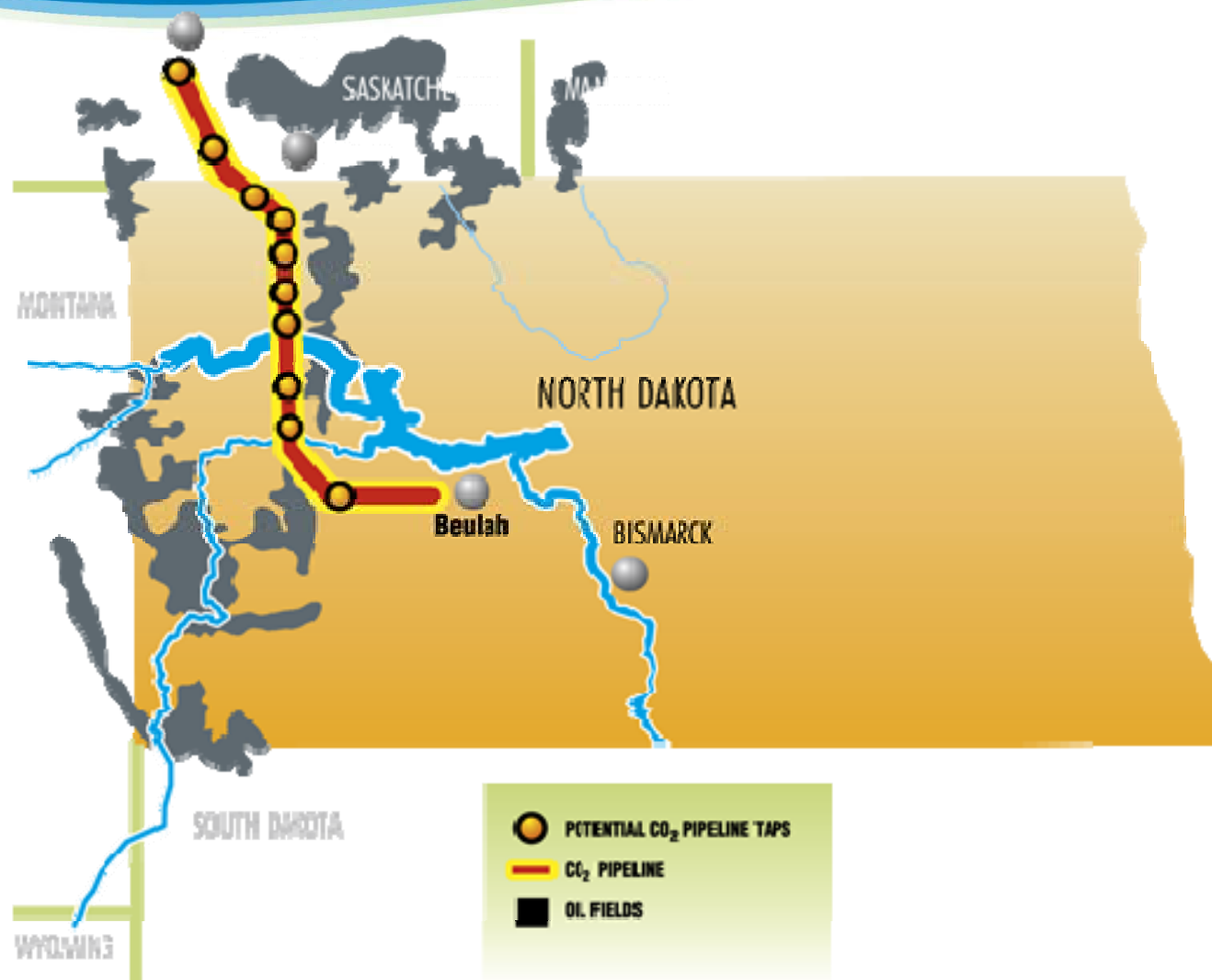
2nd Q. 2010  
~ 110 MMcfd



# Encore Acquisition Company Proposed Pipeline



# Dakota Gasification Company CO<sub>2</sub> Pipeline Beulah, ND to Weyburn, SK



# Information & Slide Contributors

- EORI at U of Wyoming – Brian Reyes and Glen Murrell
- Encore Acquisition Company – Tom Olle
- Denbury Resources
- Dakota Gasification Company
- IOGCC – Regulatory Summary