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A "CO_2 Midstream" Overview

EOR Carbon Management Workshop
Midland, TX – December 10, 2013

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Chaparral Overview

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Chaparral Overview

- Founded in 1988, Based in Oklahoma City
- Core areas — Mid-Continent (principally OK & Panhandle region)
- Stable 1P base with large potential upside – 727 MMBoe, R/P 16 years
- Oil focused:
  - Third largest "oil" producer in Oklahoma
  - (71% oil; 29% gas) – 2012 SEC Reserves
  - (64% oil; 36% gas) – 2013 Production Estimate
- Growth drivers:
  - Near-term: Unconventional Resource Drilling ~ 410,000 acres
  - Long-term: CO_2 EOR – Multiple Leases/Units

Company Statistics			
	2011	2012	Q4, 2013
Average Production (BOe/d)	~23,700	~24,910	~27,000
SEC Proved Reserves (MMBOe)	156.3	146.1	NA
SEC Proved Reserves PV_{10} ($MM)	$2,309	$2,069	NA
EBITDA ($ MM)	$313	$337	~$350

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Chaparral is a Leader in the CO_2-EOR Industry

Chaparral is the third most active CO2-EOR producer in the U.S.

Producer	# of Active CO_2-EOR Projects
OXY	31
Denbury	22
Chaparral Energy	8
Anadarko Petroleum Corporation	7
Chevron	7
Merit Energy Company	7
ExxonMobil	6
Fasken Oil and Ranch, Ltd.	5
Apache	4
Hess	4
Whiting	4
Total	105

Source: April 2012 Oil & Gas Journal

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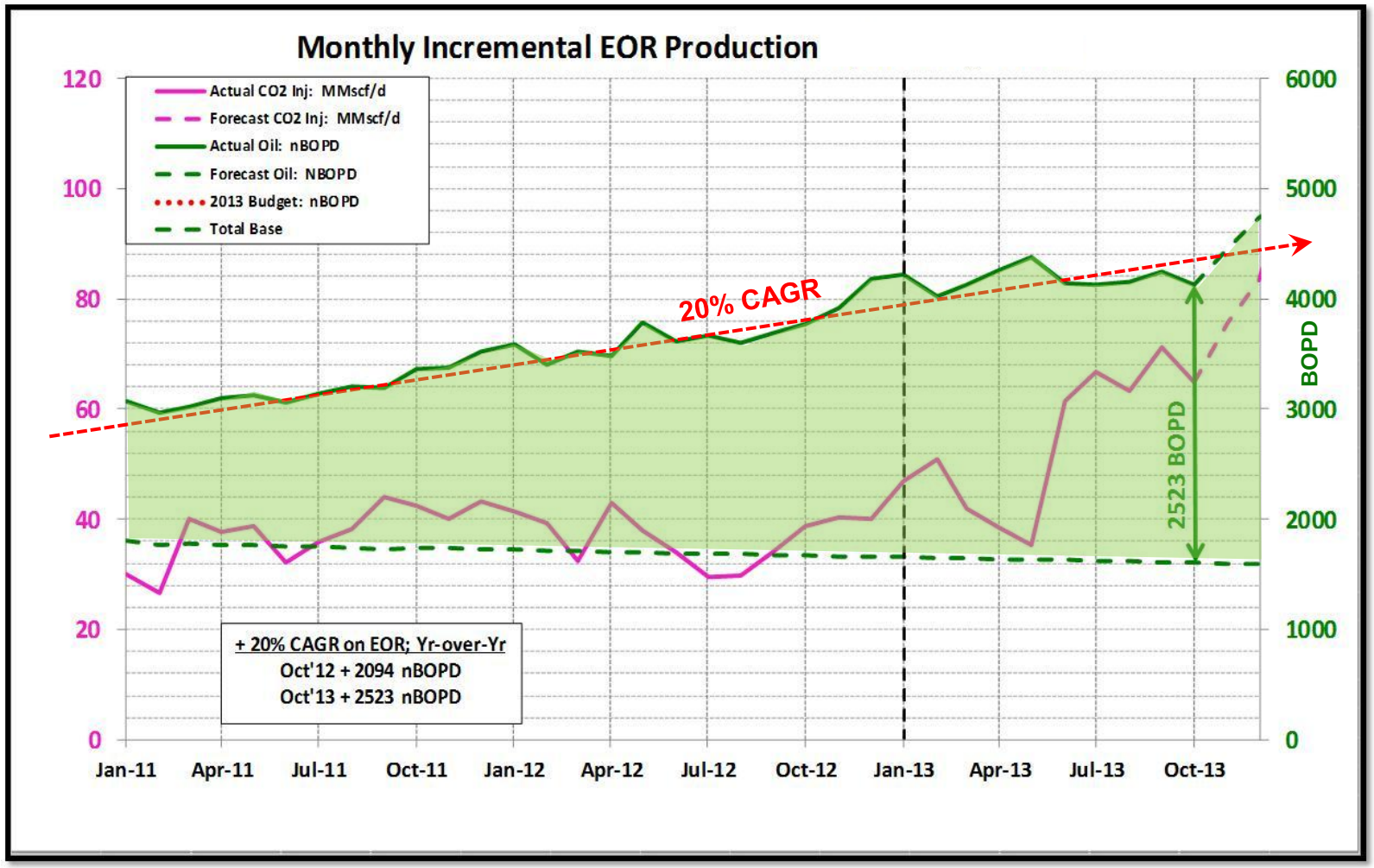
Enhanced Oil Recovery – Active Projects



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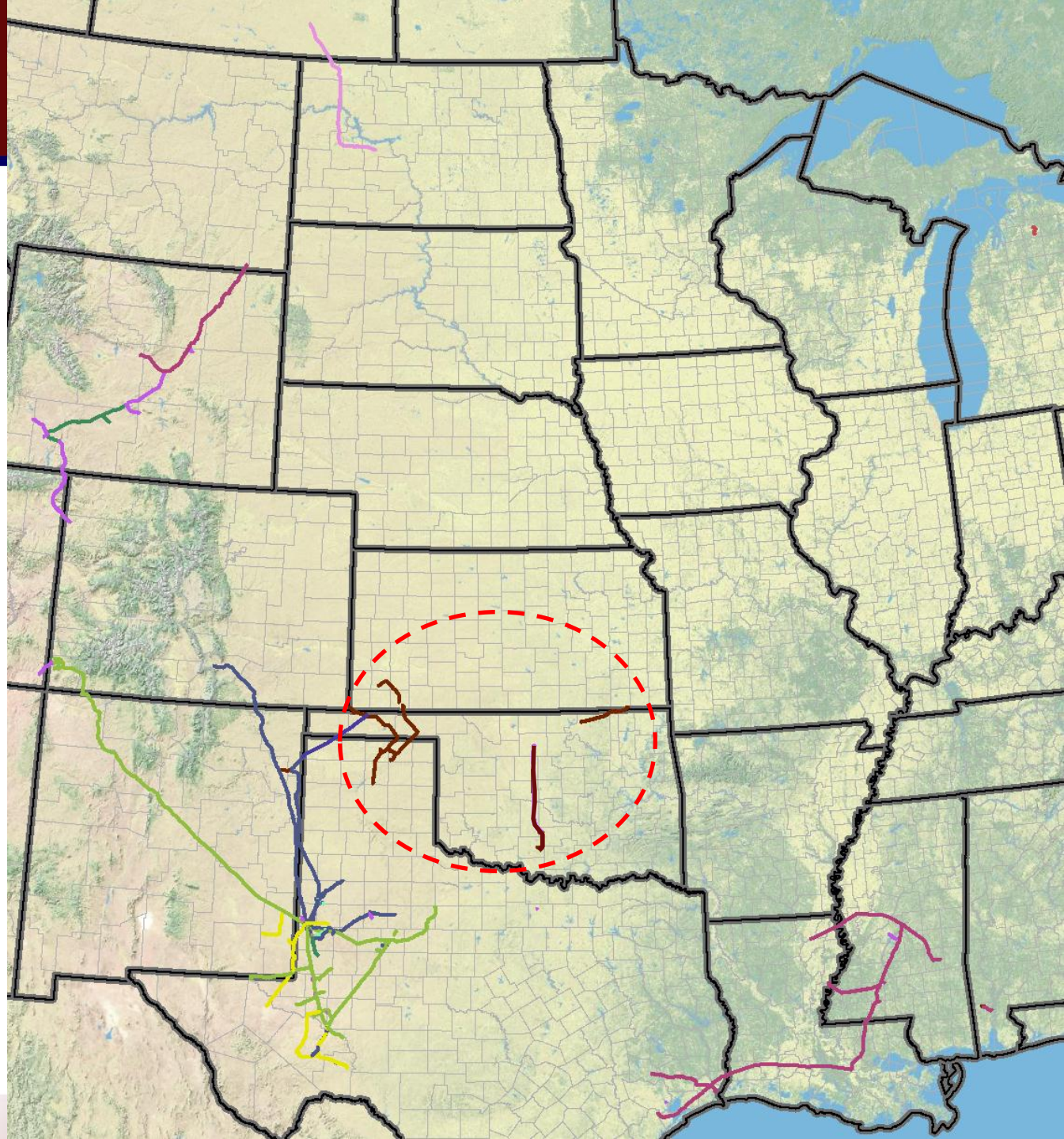
Existing CO_2 Pipelines

Today:
~4,556 mi. of CO_2 pipelines in the US

Chaparral CO_2 Infrastructure

573 Miles ownership

- 486 mi. active line
- 87 mi. inactive line



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Coffeyville CO_2 System

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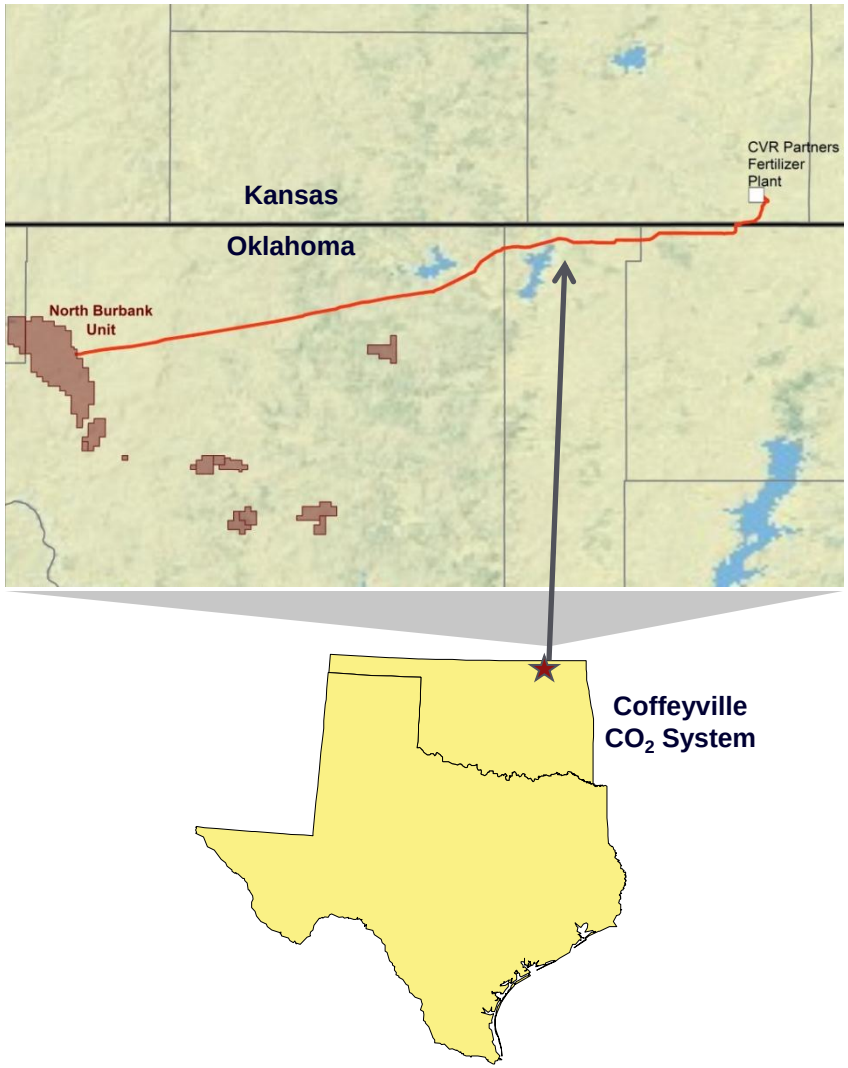
Coffeyville CO_2 System

Asset Overview

- The Coffeyville CO_2 Midstream Assets consist of:
  - Coffeyville CO_2 Compression and Dehydration Facility
  - Coffeyville CO_2 Pipeline
- CO_2 is sourced from the CVR Partners fertilizer plant in Coffeyville, KS.
- CO_2 is delivered to the North Burbank Unit, the single largest oil unit in OK
- Throughput of ~45,000 mcf/d
- Commenced operations in summer 2013

Asset Map



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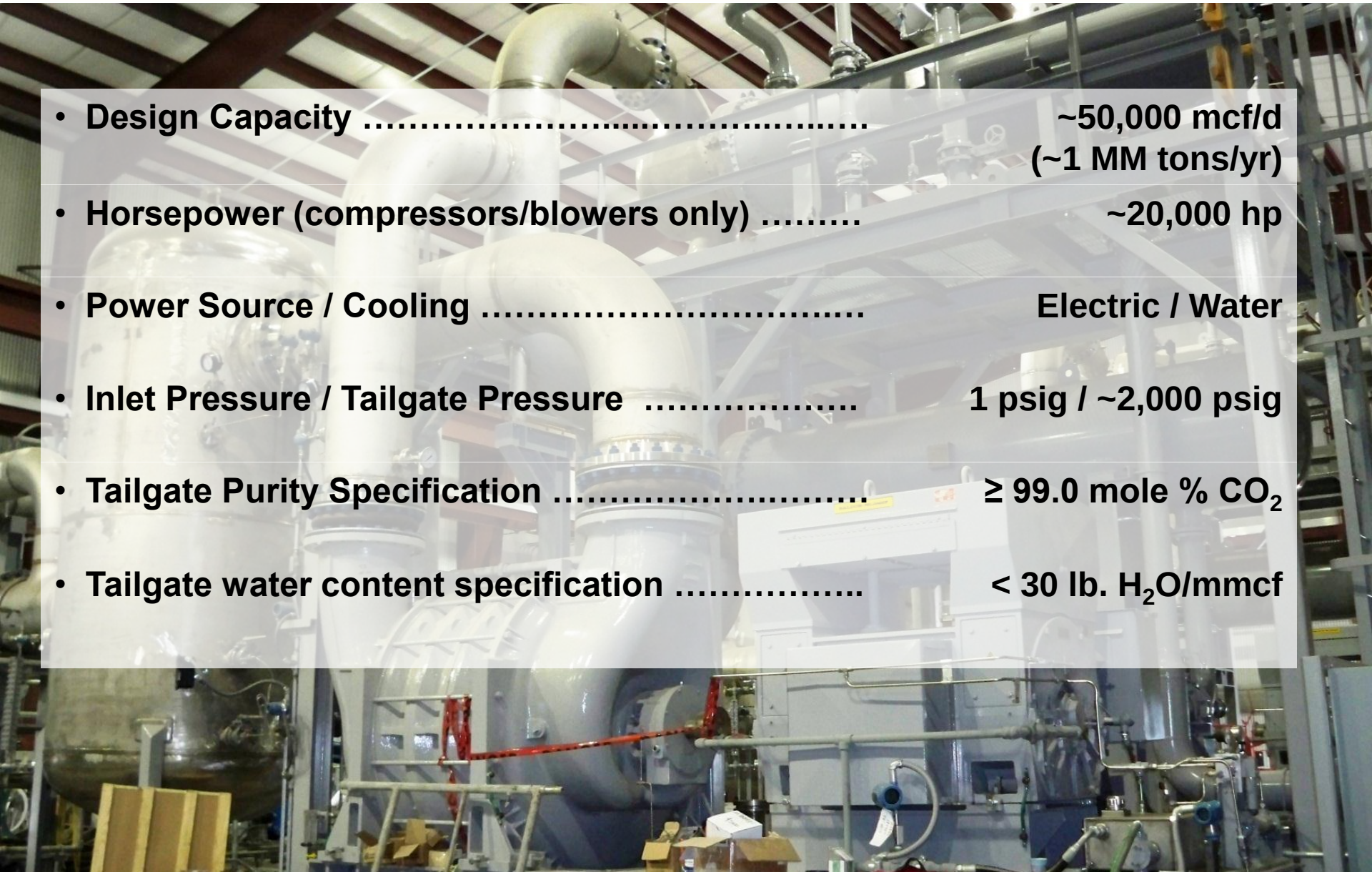
Coffeyville CO_2 Compression Facility



- **Design Capacity ……..…….…… ~50,000 mcf/d (~1 MM tons/yr)**
- **Horsepower (compressors/blowers only) …… ~20,000 hp**
- **Power Source / Cooling …… Electric / Water**
- **Inlet Pressure / Tailgate Pressure ……. 1 psig / ~2,000 psig**
- **Tailgate Purity Specification …… ≥ 99.0 mole % CO_2**
- **Tailgate water content specification …….. < 30 lb. H_2O/mmcf**

Coffeyville CO_2 Compression Facility

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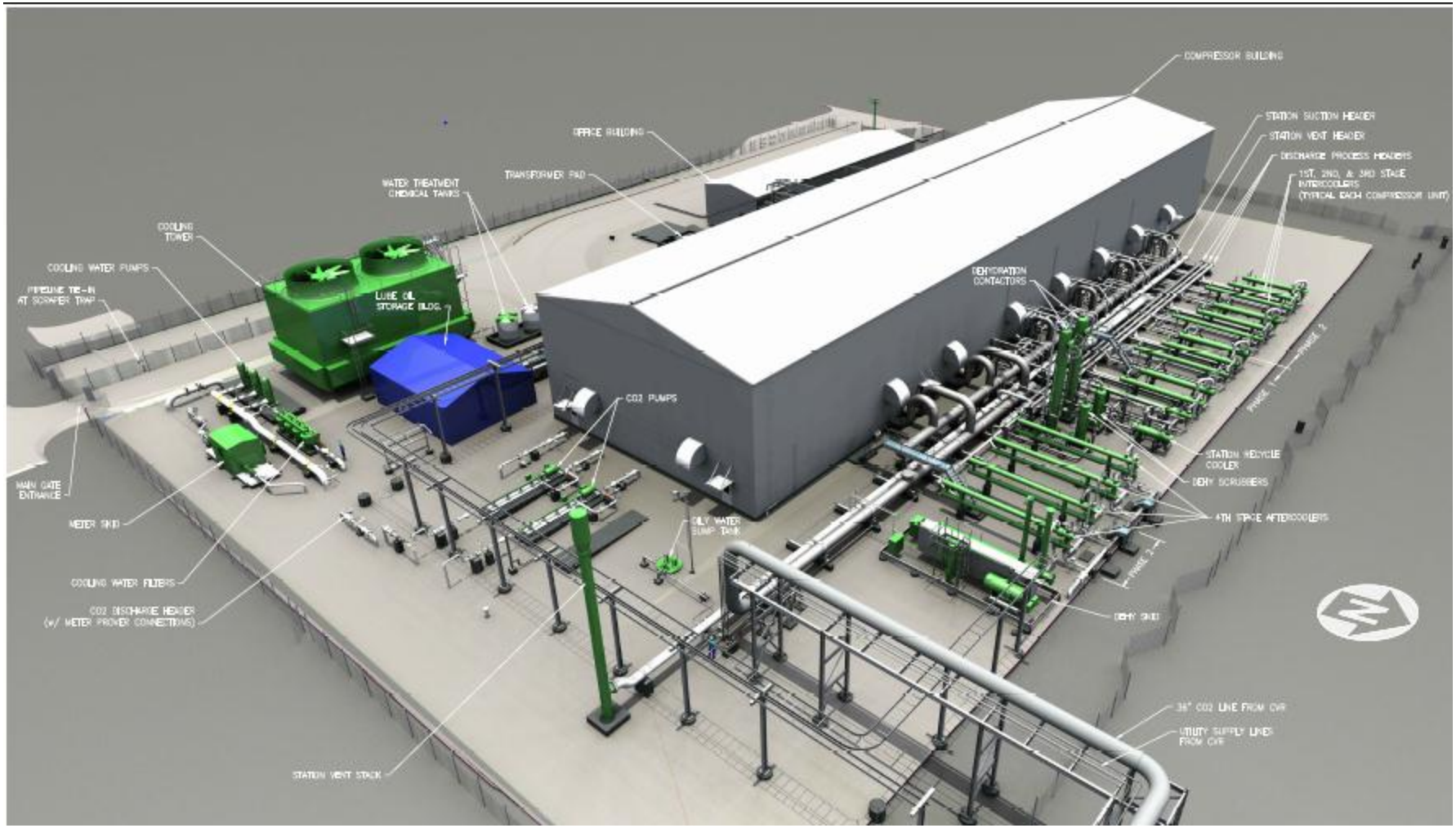
Coffeyville CO_2 Compression Facility



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Coffeyville CO_2 Pipeline – in Coffeyville, KS

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Coffeyville CO_2 Pipeline

- Mainline Length ..... 68 miles
- Size ..... 8” 900#ANSI
- Design Pressure (max) ..... 2,200 psig @ 100 F
- Line Pipe ..... X-65 - 0.279 w.t.
- Design Capacity ..... 85,000 mcf/d*
- CO_2 Purity Specification ..... ≥ 99.0 mole %
- Delivery Pressure at North Burbank Unit ... ≥ 1,200 psig

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* with additional pumps

Coffeyville CO_2 Pipeline

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Panhandle CO_2 System

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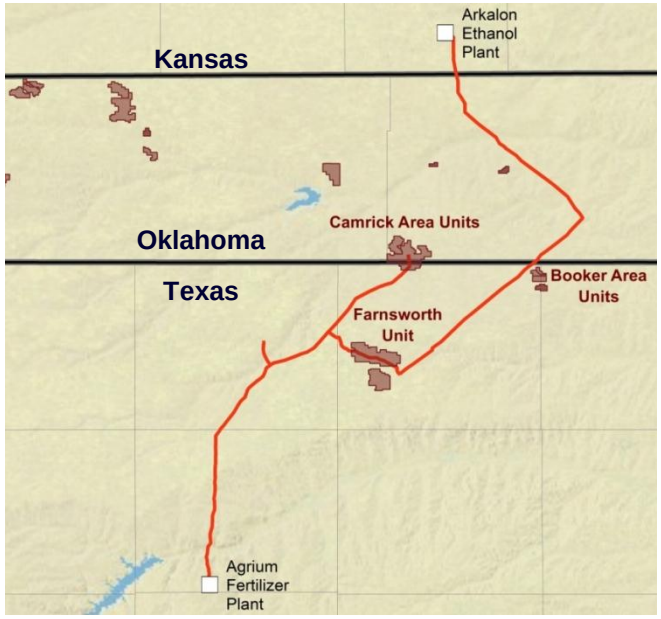
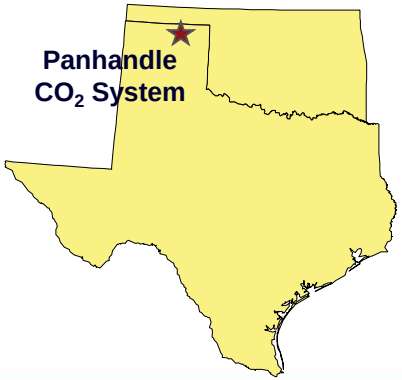
Panhandle CO_2 System

Asset Overview

- The Panhandle CO_2 Midstream Assets consist of:
  - CO_2 Source Facilities:
    - Borger CO_2 Compression and Dehydration Facility
    - Arkalon CO_2 Compression, Dehydration and Processing Facility
    - Sourced by two separate CO_2 facilities totaling ~17,000 HP located at a fertilizer plant in Borger, TX and an ethanol plant in Liberal, KS
  - CO_2 Pipelines: 172.5 miles of active CO_2 pipeline, including:
    - Borger CO_2 Pipeline
    - TexOk CO_2 Pipeline
- CO_2 from the Panhandle System is delivered to Chaparral-operated EOR fields in three project areas, totaling six separate EOR units

Asset Map





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Borger CO_2 Compression Facility

Borger CO_2 Compression Facility

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Borger CO_2 Pipeline

- 56.6 miles of 8” line
  - Installed in 1979, for delivery of CO_2 to Hansford Marmaton Unit and North Farnsworth Marmaton Unit, operated by Transpetco
  - Designed by Eagleton Engineering
  - Idled from ~1992 through ~2000
  - Reactivated in 2001 for delivery of CO_2 to Camrick Unit
- 24.6 miles of 6” line
  - Installed in ~2000
  - Extends older pipeline north into Oklahoma
  - Has been in CO_2 service since Feb. 2001
- 8.5 miles of 6” line
  - Installed in 2010-2011
  - Connects older pipeline to Farnsworth Unit
  - Has been in CO_2 service since March 2011

Inlet at Borger CO_2 Compression Facility

Delivery Point at Farnsworth Unit

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Arkalon CO_2 Processing Facility

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TexOk CO_2 Pipeline

- 65.8 miles of 4.5” line
  - Installed in late 1960s by Cities Service, and in 1973 and 1980 by Koch Industries – all for NGL service
  - Idled from ~2004 through ~2009 with N_2 purge
  - Chaparral acquired the line in 2006, and reactivated in 2009 for delivery of CO_2 to Booker Units
  - Has been in CO_2 service since 2009
- 16.3 miles of 6” line
  - Installed in ~2008
  - Connects Arkalon CO_2 Facility to old NGL line
  - Has been in CO_2 service since 2009
- 5.8 miles of 4.5” line
  - Installed in 2010
  - Connects older pipeline to Farnsworth Unit
  - Has been in CO_2 service since Dec. 2010
- Elmwood CO_2 Booster Pump

Inlet to TexOk Pipeline, at Arkalon CO_2 Processing Facility

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Velma CO_2 System

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Velma CO_2 System

Asset Overview

- The Velma CO_2 Midstream Assets consist of:
  - Enid CO_2 Compression Facility
    - Partial ownership; operated by Merit
    - Connected to Koch Fertilizer Plant
  - Enid-to-Velma CO_2 Pipeline Segment
    - Partial ownership; portions operated by Merit, and portions operated by Chaparral
    - Capacity: ~35,000 mcf/d
  - Velma, NW Hoxbar CO_2 Pipeline
    - Installed in 2010
- ~145 miles of CO_2 pipeline

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Enid CO_2 Compression Facility

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A Word on "CO_2 Loss" at EOR Fields

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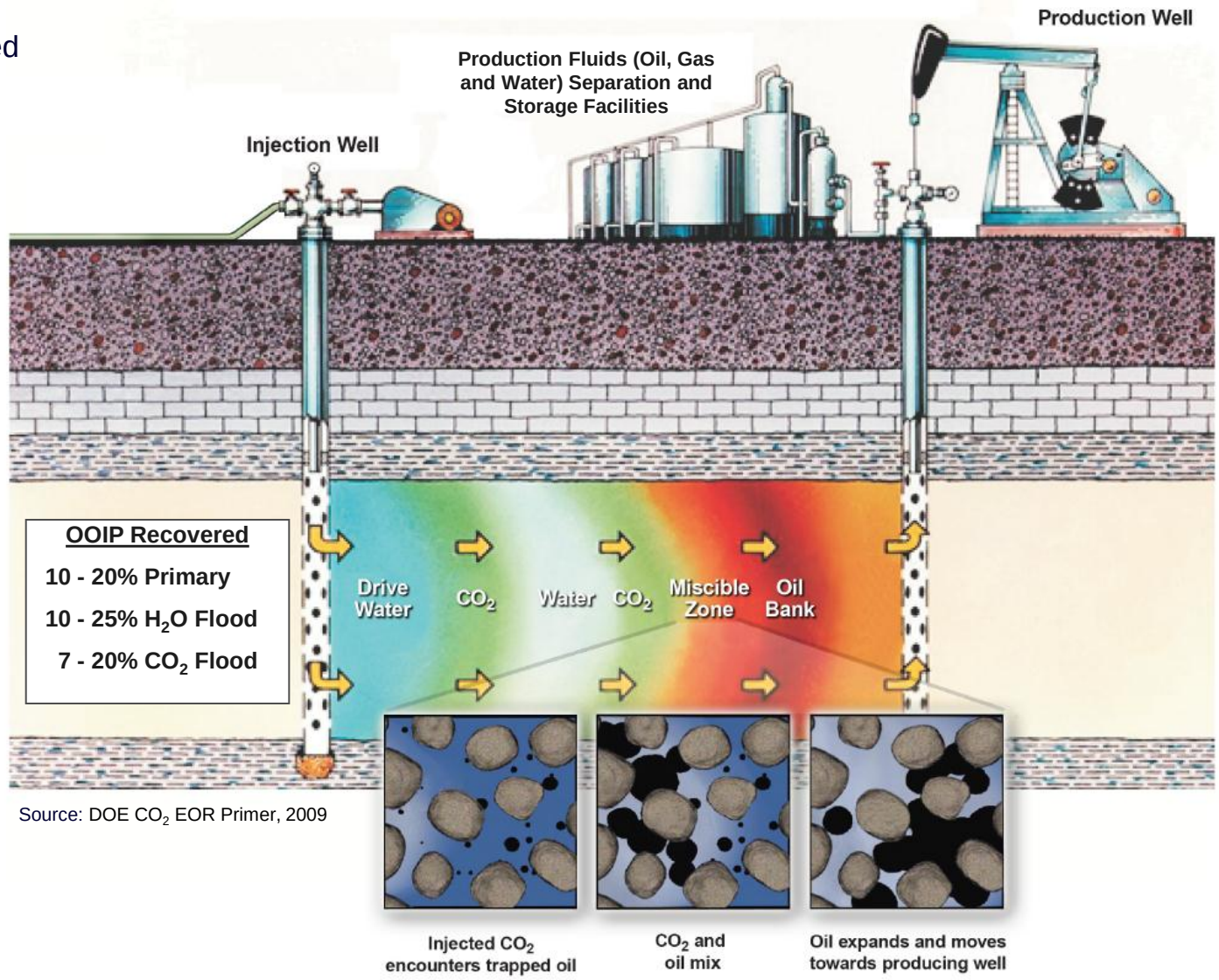
CO_2-EOR Mechanics

- Interfacial Tension Reduced
  - Oil sticks less to rock
- Swelling of Oil
  - Oil & CO_2 combine as a single phase, providing more efficient miscible displacement
- Improved Viscosity
  - Viscosity of the combined miscible phase is reduced, allowing the fluid to be flushed to producers
- WAG Injection
  - CO_2 is introduced in alt-ernating cycles with H_2O
  - Provides greater sweep efficiency in the flood
  - Aides in controlling gas production



Source: DOE CO_2 EOR Primer, 2009

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Enhanced Oil Recovery

The Closed-Loop CO_2 System

~100% Retention

CO_2 Delivery to the Field

CO_2 Recycle Pump Back to Injectors

CO_2 Recycle Compression

CO_2 Injection Well

Gas-Oil-Water Separation

EOR Production Well

Production "Header"

"Green Oil"

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A Word on "CO_2 Loss" at EOR Fields

- EOR Fields have "original oil in place" (OOIP), and original reservoir pressure.
  - The oil would not have "been there" without a sealed reservoir, horizontally and vertically
  - The pressure would not have existed without sufficient 'caprock'
  - CO_2-EOR Fields are intentionally operated at near-original reservoir pressures, to maximize oil recovery – while simultaneously storing non-recycled CO_2
- Possible loss of any reservoir fluid is only through man-made penetrations into the reservoir, or ill-defined reservoir limitations.
  - For decades, state regulators have governed definitions of reservoir limitations as well as authorizing every penetration into the reservoir
  - States, not federal government, have the knowledge base and experience to adequately predict supposed "CO_2 Loss" potential from the reservoir

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A Few Concluding Thoughts

- Past vs. Future CO_2 Supply and EOR Fields:
  - The past 40 years have seen larger, geologic, supply of CO_2 - for larger EOR fields.
  - The future will likely see mid to smaller, anthropogenic, supply of CO_2 - for mid to smaller EOR fields. Chaparral is already a leader in this market.
- CO_2 Capture from anthropogenic sources is technically sound and economically feasible. Chaparral is an expert in "CO_2 Midstream" operations, and owns CO_2 Midstream Systems that have captured man-made CO_2 since as early as 1982.
- MLP activity in the CO_2-EOR industry will likely continue to increase – both on CO_2 delivery systems and mature EOR properties.

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