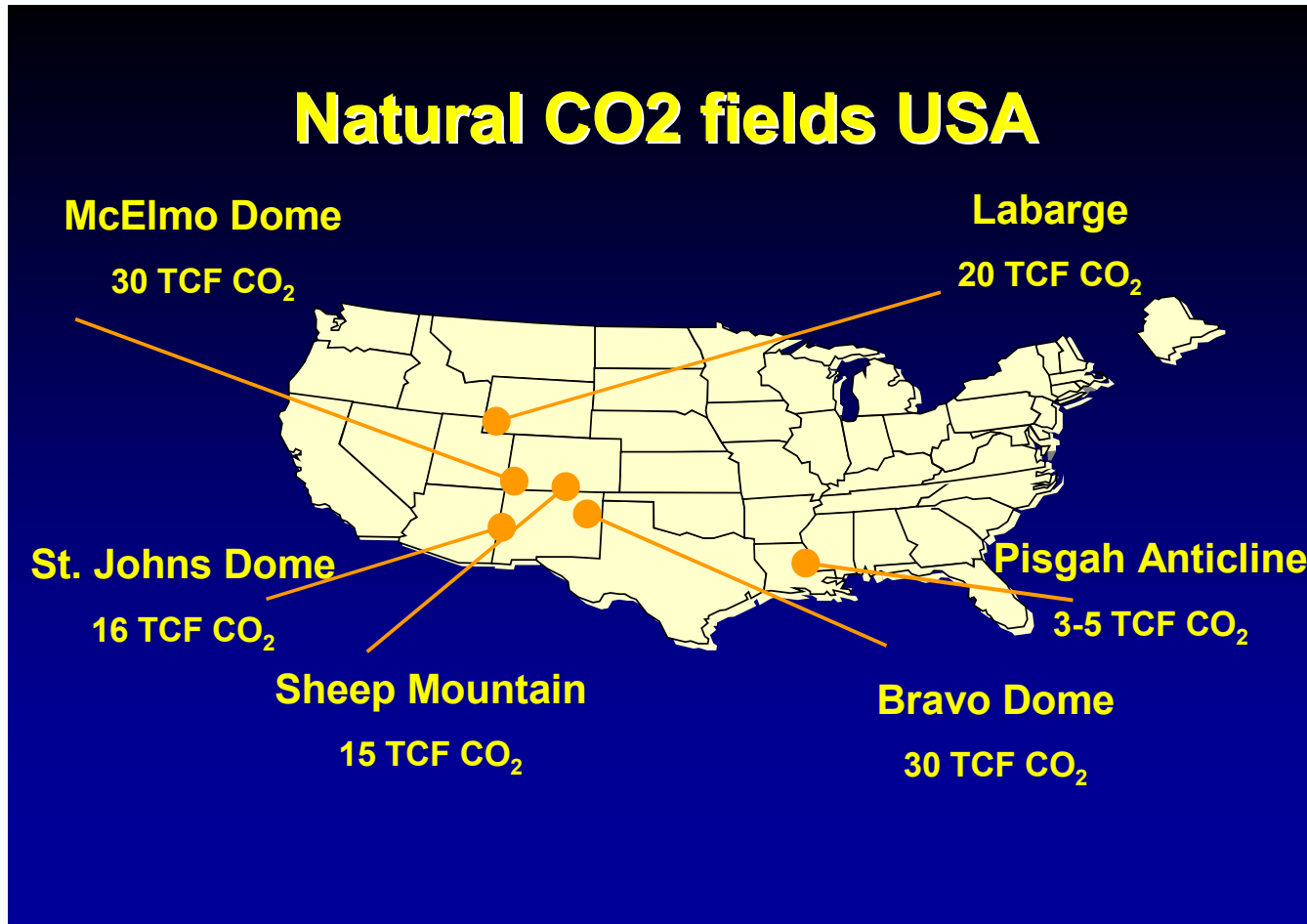

CO₂ Transport

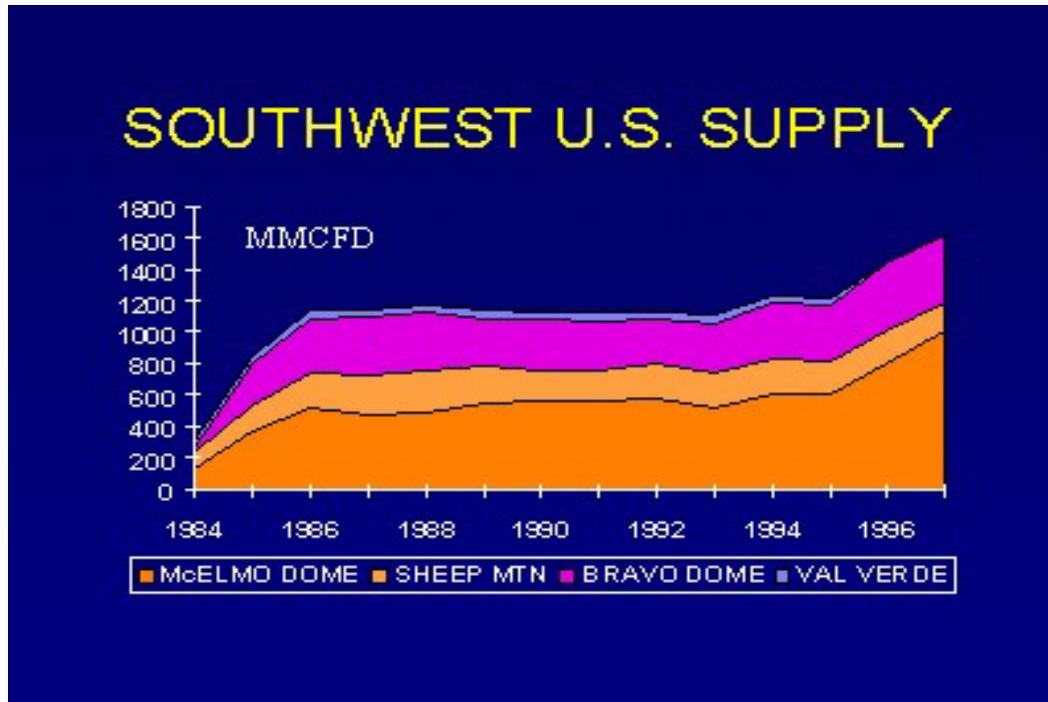
Nick Riley
British Geological Survey

CO2 Transport Infrastructure

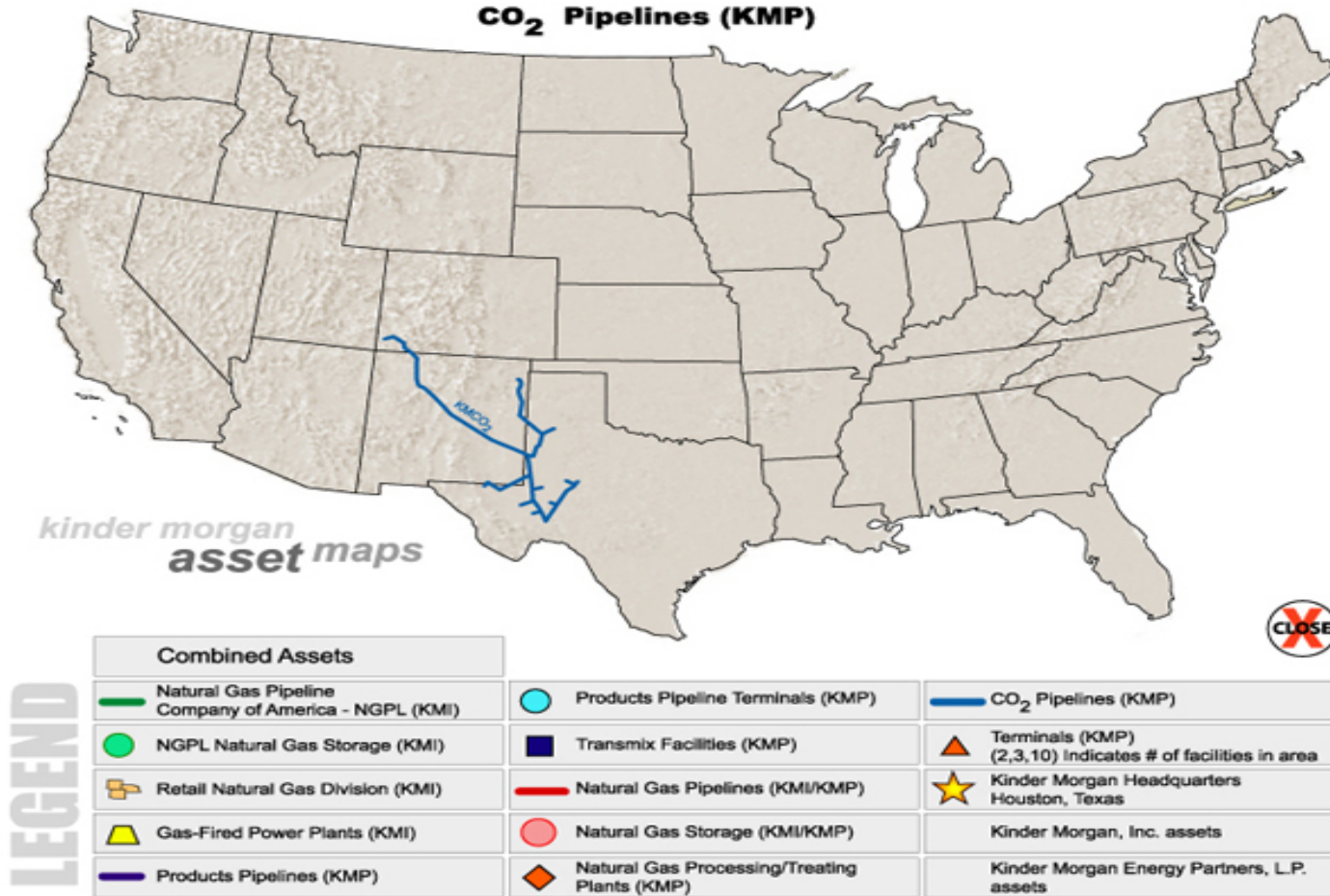
Natural CO2 fields USA



CO2 Transport Infrastructure



CO2 Transport Infrastructure



CO2 Transport Infrastructure

KM CO₂ Company

CO2 Reserves

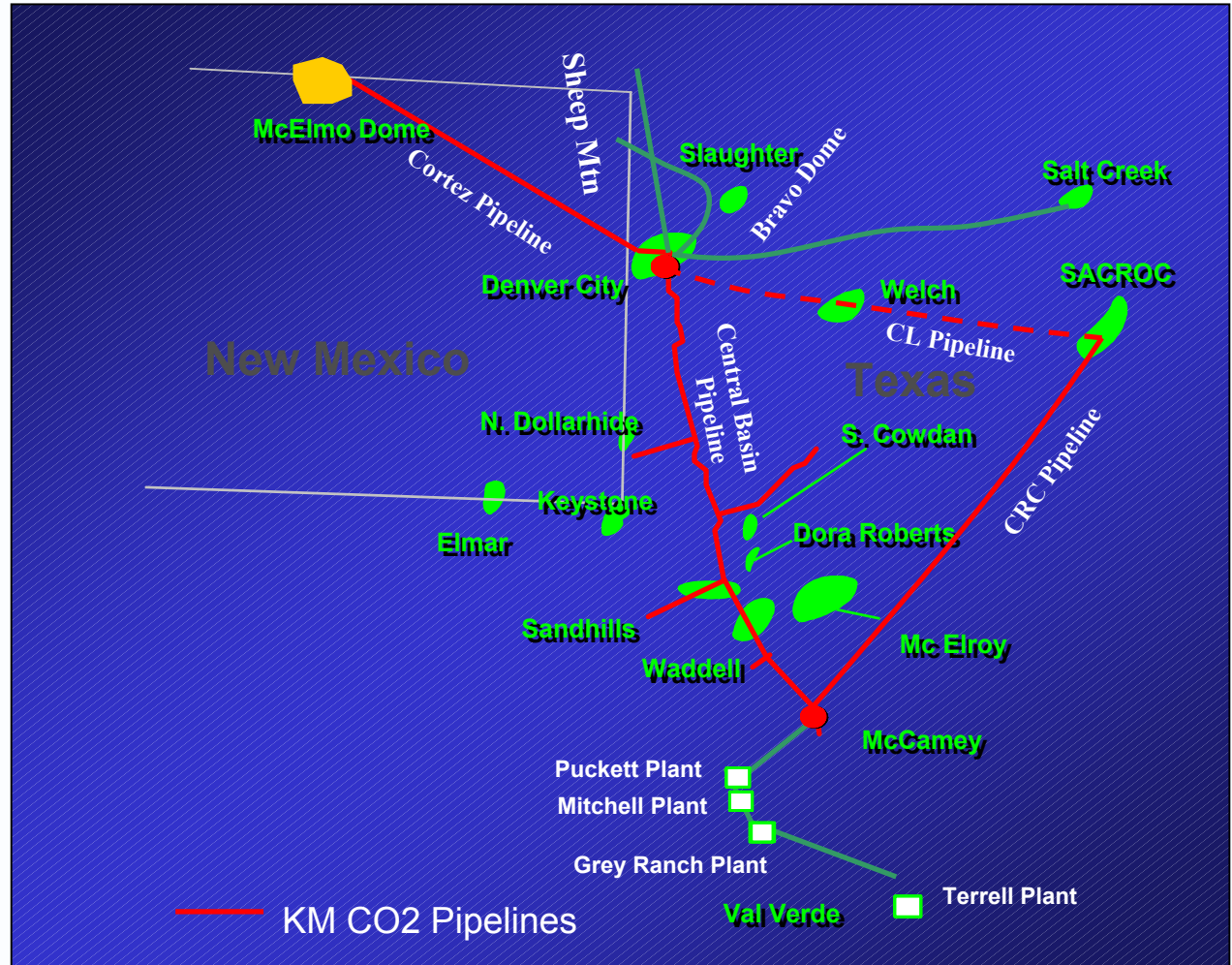
- McElmo Dome
- 13 tcf (.4 tcm) reserves
- 98%+ purity
- High pressure
- Production 900 mmcfpd (26 mmcmpd)

Pipelines

- 2,000 + miles (3,219km)
- Four major trunk lines
- Capacity: 1,200 mmcfpd (34 mmcmpd)

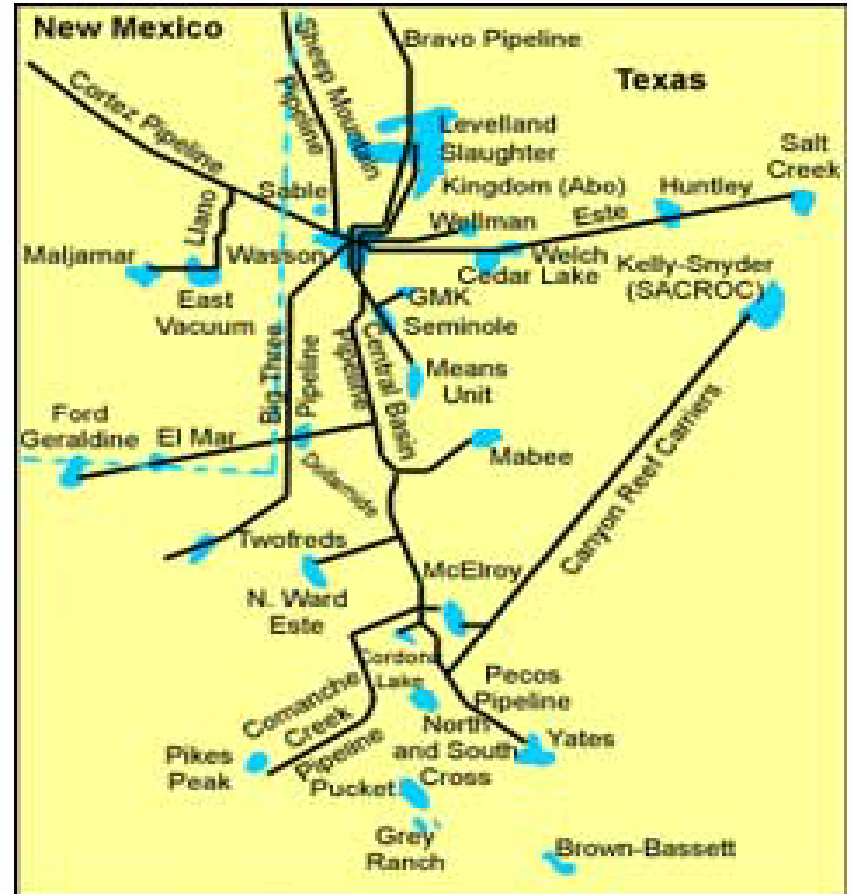
Oil production

- Operator SACROC Unit
- Interest in other CO₂ floods
- Production: 20,000 bopd



CO2 Transport Infrastructure

Pipe diameter (inches)	CO ₂ capacity MCFD
4	15
10	30
18	60



CO2 Transport Infrastructure



WHAT IS A PIPELINE EMERGENCY?

- A weakened or damaged pipeline
- Fire or explosion near or directly involving a pipeline or pipeline facility
- A natural disaster affecting the pipeline, such as an earthquake, flood or soil erosion
- A leaking pipeline

HOW TO RECOGNIZE A PIPELINE LEAK WHEN NEAR A PIPELINE RIGHT OF WAY

- LISTEN FOR:** Hissing or roaring sound
- LOOK FOR:** A white cloud, fog, or ice
Dying plants amid healthy ones
Unusual blowing of dirt or dust
Persistent bubbles in water

WHAT TO DO IN A PIPELINE EMERGENCY

- Immediately leave the area – on foot – in an upwind direction
- Avoid making contact with escaping liquids or vapors
- Abandon all equipment being used in the area
- DO NOT drive into an area in which you encounter a leak or vapor cloud
- Warn others to stay away from the area
- DO NOT try to operate any pipeline valves yourself
- From a distant phone, call Kinder Morgan's CO₂ Emergency number, 1-877-390-8640, and call 911 or your local fire, police, or sheriff's office

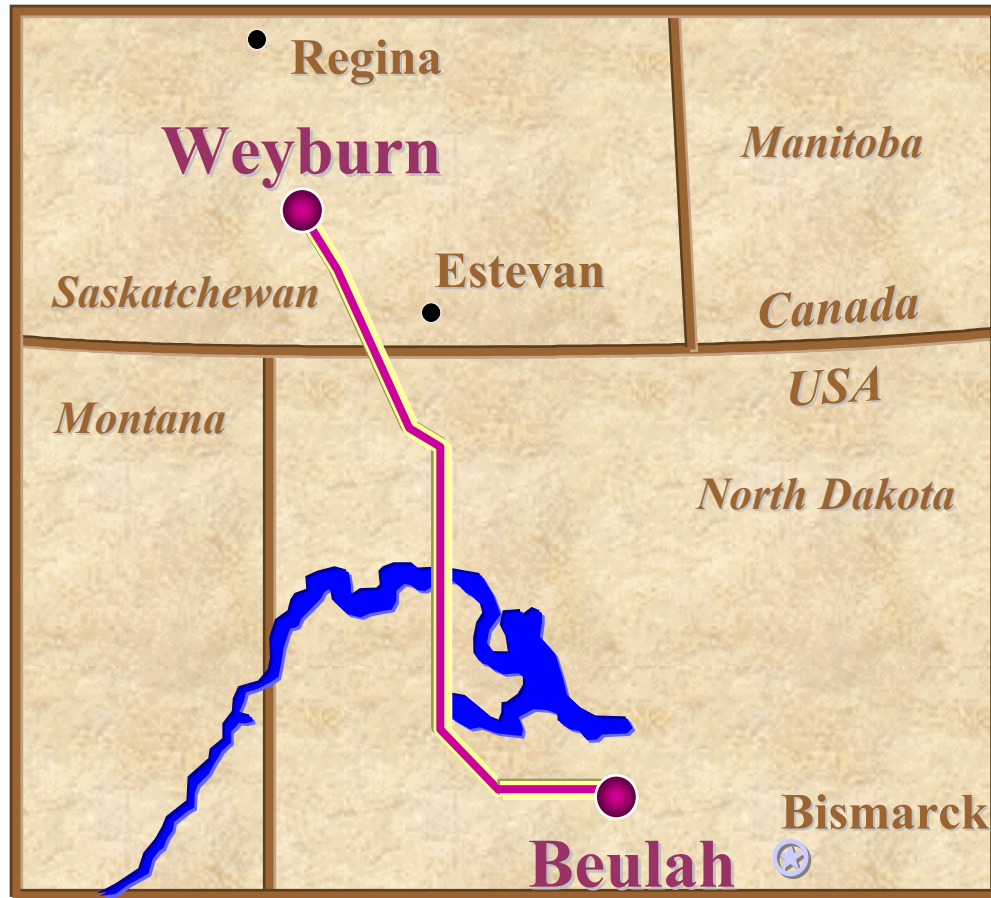
CO2 Transport Infrastructure

Pipeline	Nat Gas	Haz Gas	CO ₂
Incidents	510	1220	5
Fatalities	21	16	0
Injuries	75	66	0
Damage\$	135m	370m	0.054m
1000km/y	0.14	0.69	0.23

Comparative pipeline incident statistics (1994 - 2000)

Source: Office of Pipeline Statistics/ US Department of Transportation

CO2 Transport Infrastructure



CO2 Transport Infrastructure

- **DGC-WEYBURN PIPELINE Carbon dioxide specifications**

CO₂ 96% by volume

H₂S 0.9%

CH₄ 0.7%

C₂+hydrocarbons 2.3%

CO 0.1%

N₂ <300 ppmbv

O₂ <50 ppmbv

H₂O <20 ppmbv

