



EERC



UNIVERSITY OF
NORTH DAKOTA



Critical Challenges. Practical Solutions.



Energy & Environmental Research Center (EERC)

A ROAD MAP FOR GROWTH OF COMMERCIAL CCUS PROJECTS IN THE UPPER GREAT PLAINS AND NORTHWESTERN REGIONS OF NORTH AMERICA

CCUS 2025

Houston, Texas

March 3, 2025

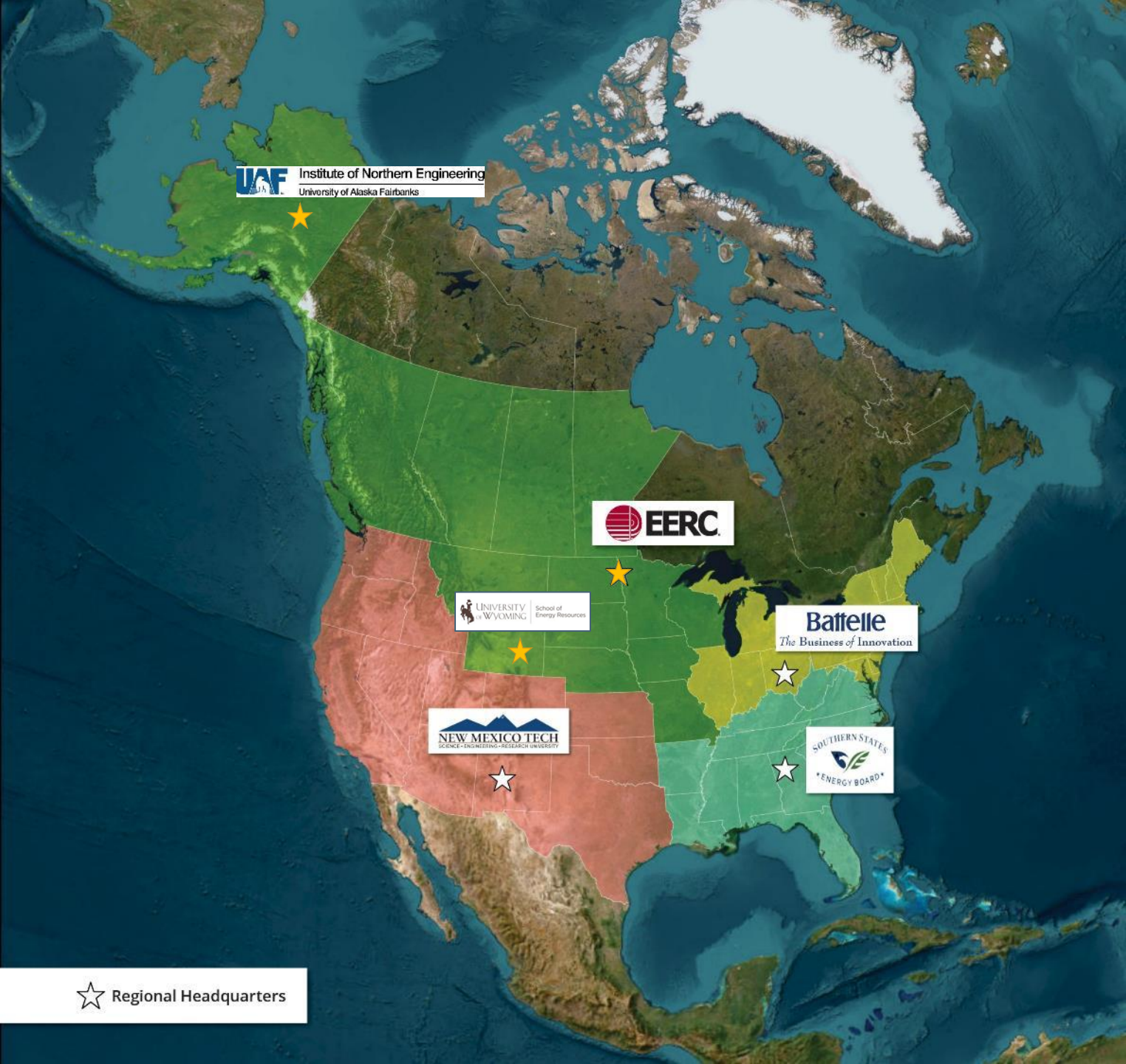
Kevin C. Connors

Assistant Director for Regulatory Compliance and Energy Policy

The background of the slide is a photograph of the Energy & Environmental Research Center (EERC) building. The building is a multi-story structure with a mix of brick and light-colored stone or concrete. A prominent sign above the entrance reads "Energy & Environmental Research Center" with a circular logo to the left. The building has several large windows and a flat roof with various antennas and equipment. The scene is set outdoors with trees and a clear blue sky.

**CRITICAL CHALLENGES.
PRACTICAL SOLUTIONS.**

The EERC is a leader in developing new technologies and practical solutions to critical energy challenges.



REGIONAL CARBON SEQUESTRATION PARTNERSHIP INITIATIVE

Critical Challenges. Practical Solutions.

PCOR PARTNERSHIP

2003–2005 – PCOR Partnership: Characterization

2005–2008 – PCOR Partnership: Field Validation

2007–2019 – PCOR Partnership: Commercial Demonstration

2019–2027 – PCOR Partnership Initiative: Commercial Deployment



U.S. DEPARTMENT OF
ENERGY



NATIONAL
ENERGY
TECHNOLOGY
LABORATORY



Institute of Northern Engineering
University of Alaska Fairbanks



UNIVERSITY
of WYOMING | School of
Energy Resources



UNIVERSITY OF
NORTH DAKOTA

The PCOR Partnership Initiative addresses regional capture, transport, use, and storage challenges facing commercial CCS/CCUS deployment. The initiative focuses on:

- **Strengthening** the technical foundation for geologic CO₂ storage and enhanced oil recovery (EOR).
- **Advancing** capture technology.
- **Improving** application of monitoring technologies.
- **Promoting** integration among capture, transportation, use, and storage industries.
- **Facilitating** development of regulatory frameworks.
- **Providing** scientific support to policymakers.
- **Engaging** the public through outreach and education.

PCOR PARTNERSHIP

2003 – Present



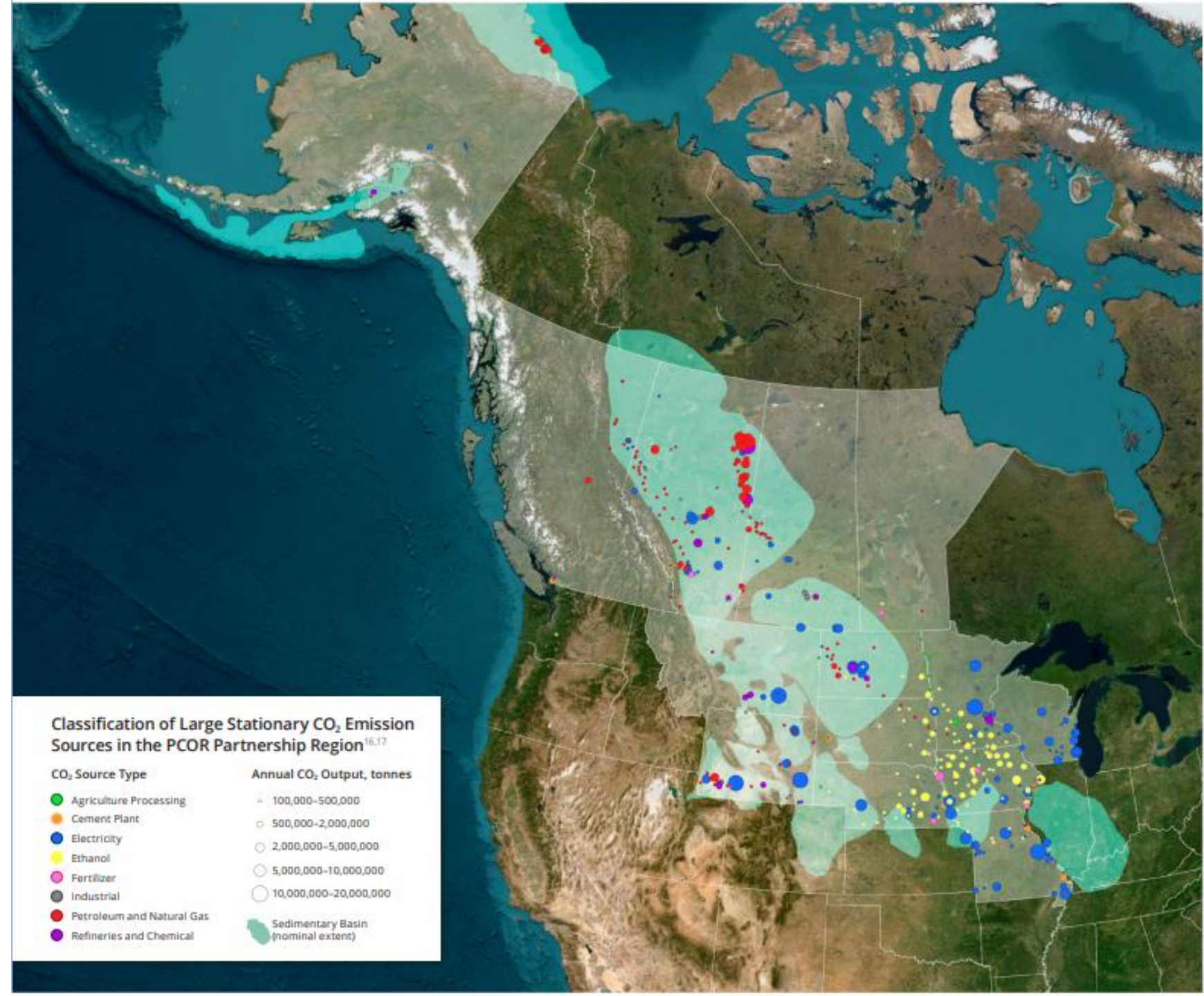
Our partners inform our priorities.



PARTNERSHIP MEMBERS



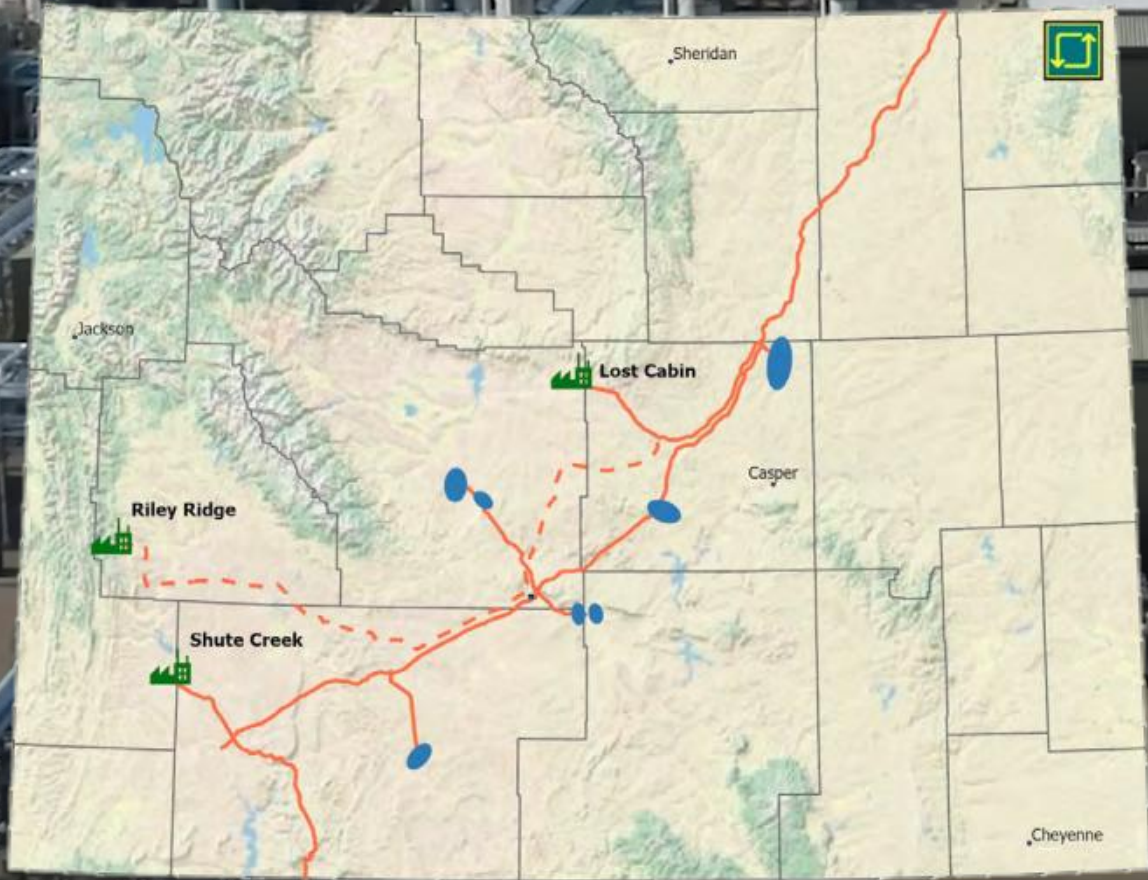
CO₂ SOURCES AND SEDIMENTARY BASINS



Major emission sources are interwoven with the regional economy – acting as economic pillars.

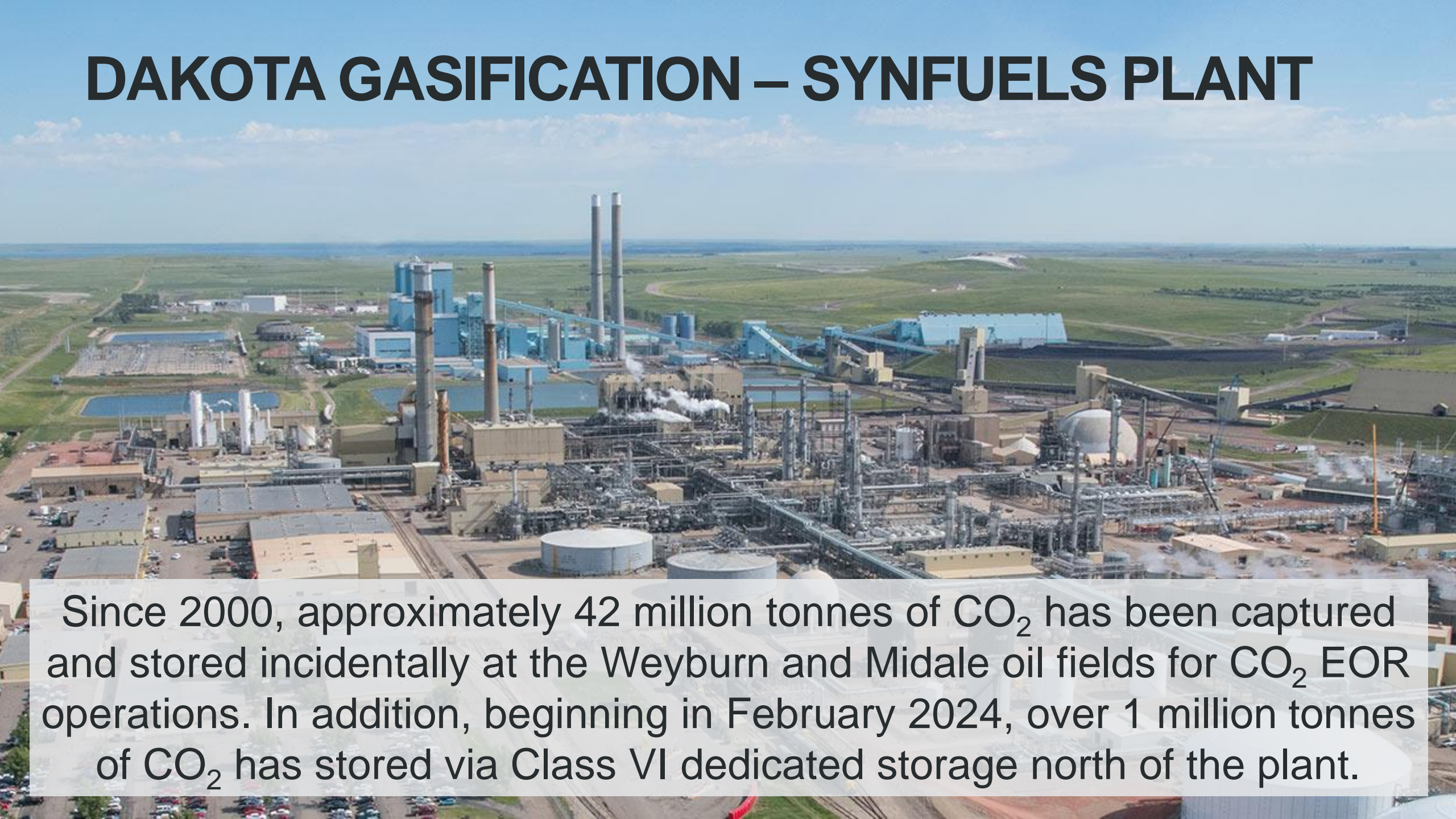


SHUTE CREEK GAS-PROCESSING FACILITY



Since 1986, over 217 million tonnes of cumulative CO₂ has been captured and stored incidentally during CO₂ EOR operations.

DAKOTA GASIFICATION – SYNFUELS PLANT



Since 2000, approximately 42 million tonnes of CO₂ has been captured and stored incidentally at the Weyburn and Midale oil fields for CO₂ EOR operations. In addition, beginning in February 2024, over 1 million tonnes of CO₂ has stored via Class VI dedicated storage north of the plant.

BOUNDARY DAM CARBON CAPTURE PROJECT



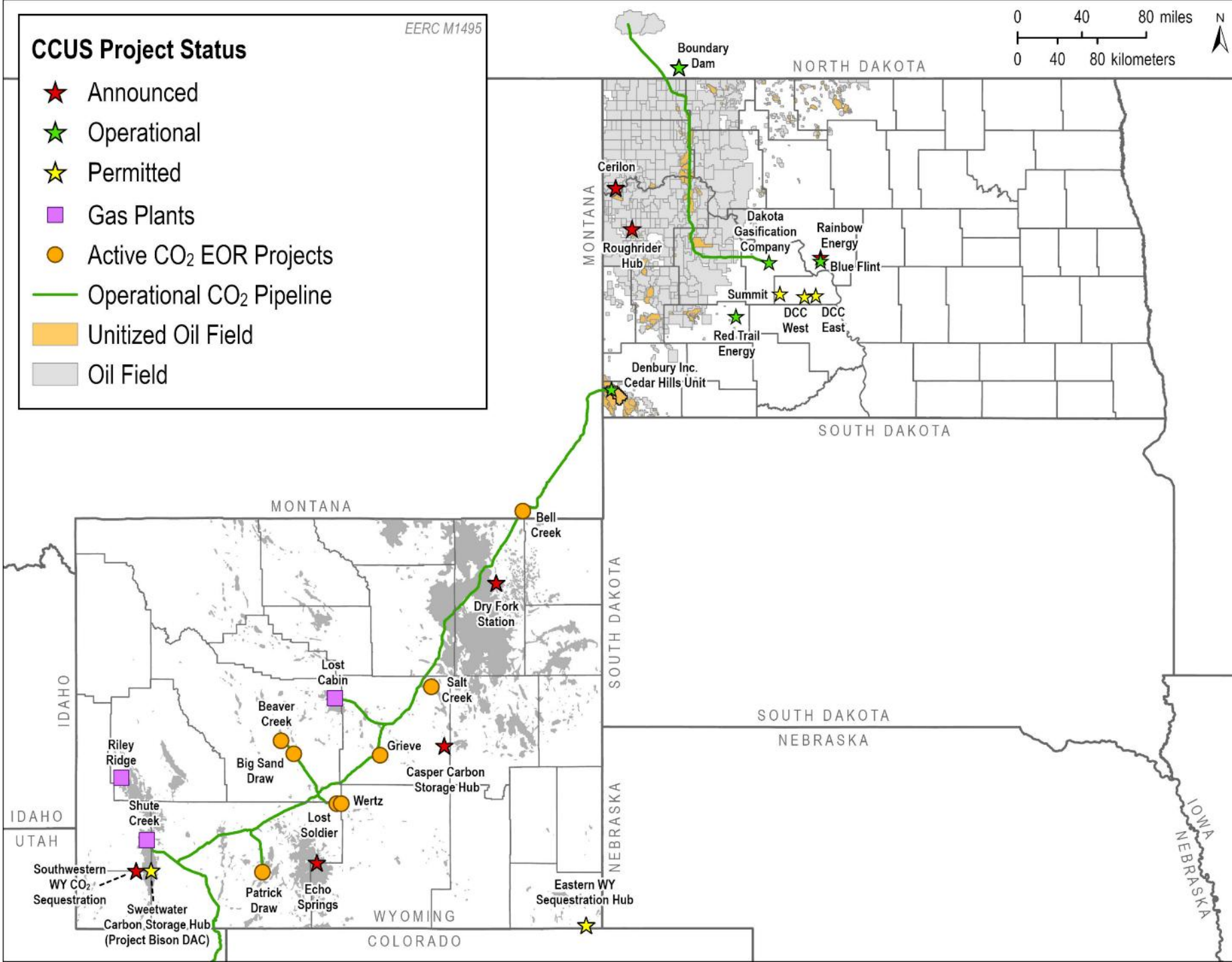
Since 2014, nearly 6.0 million tonnes of CO₂ has been captured from Boundary Dam and stored incidentally at the Weyburn CO₂ EOR operation and also permanently stored at Aquistore.

SHELL QUEST CCS FACILITY

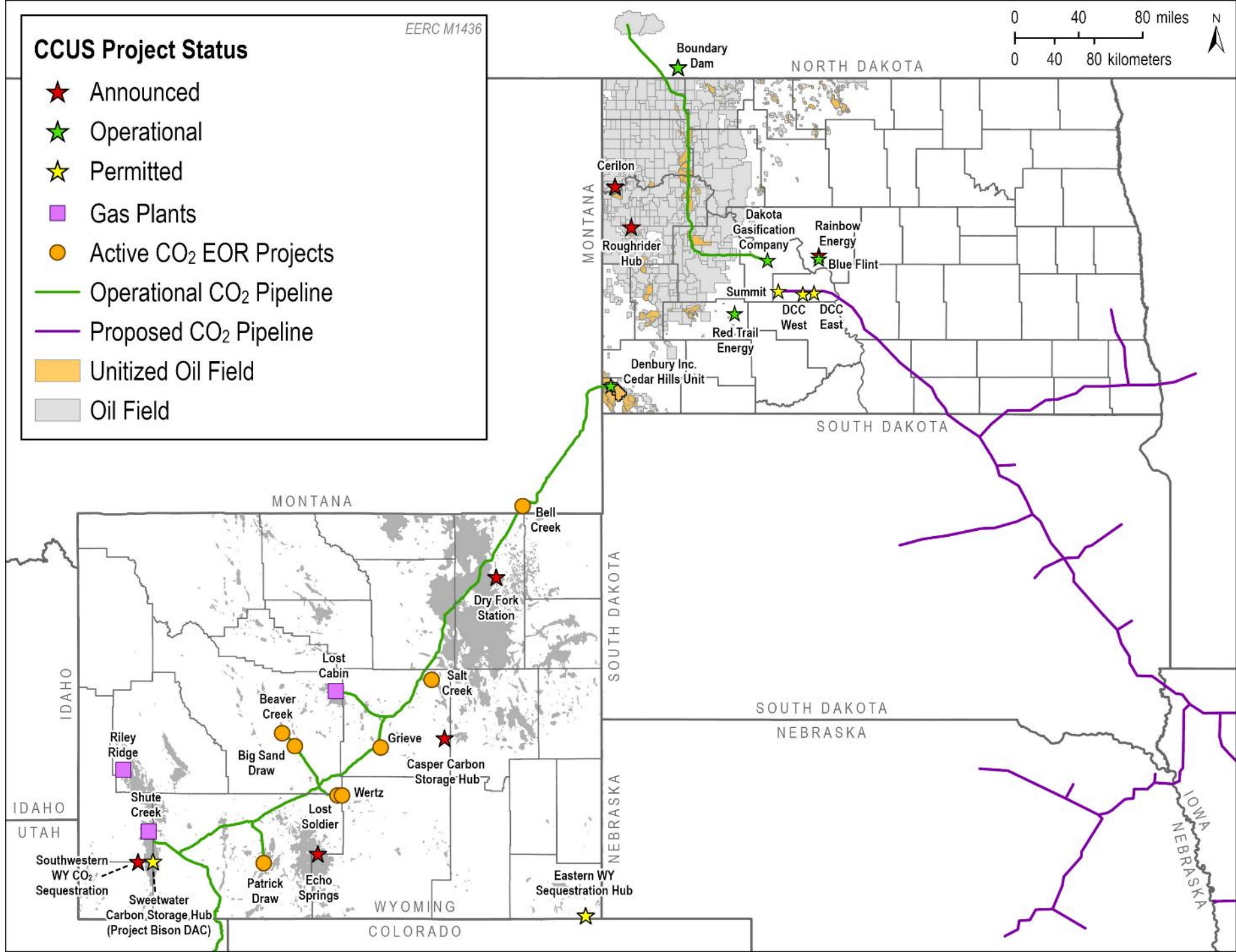
A wide-angle photograph of the Shell Quest CCS facility. The image shows a complex industrial site with numerous large white cylindrical storage tanks, a dense network of silver pipes, and a complex steel structure of walkways and platforms. A tall smokestack on the left is emitting a plume of white steam. The sky is clear and blue. In the foreground, there are some yellow safety barriers and a sign that reads "PROCESS AREA BEYOND".

Since 2015, over 9.0 million tonnes of CO₂ has been captured and stored (as of May 2024).

REGIONAL CARBON MANAGEMENT



REGIONAL CARBON MANAGEMENT



ND CCUS PROJECTS

ANNOUNCED, PERMITTED, AND OPERATIONAL

Operational

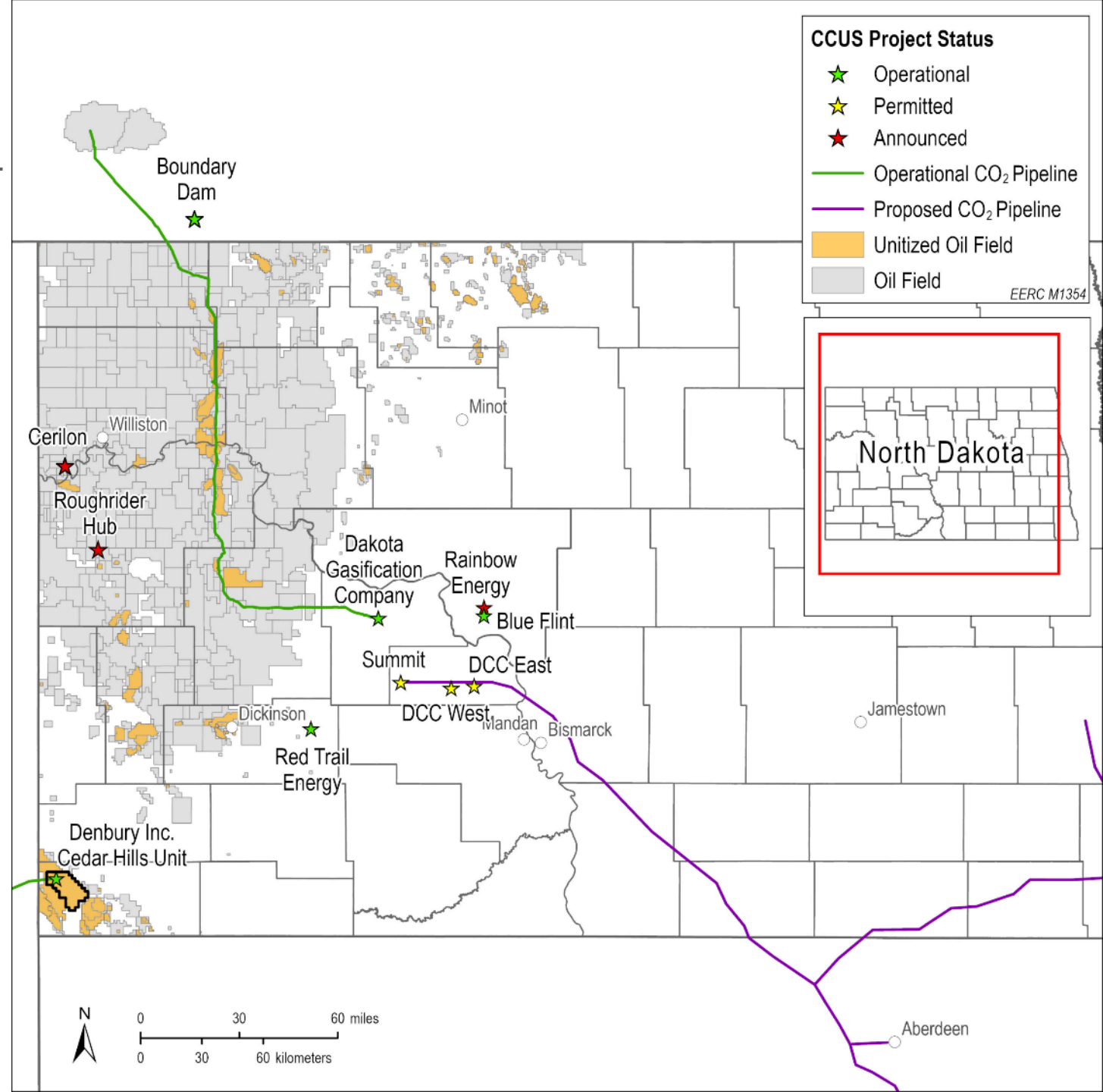
- Red Trail Energy – Ethanol: 180 Kty to saline
- Blue Flint – Ethanol: 200 Kty to saline
- DGC – Coal gasification: 2.7 Mty to saline
- Denbury Cedar Hills – Gas plant: 1 Mty to EOR

Permitted

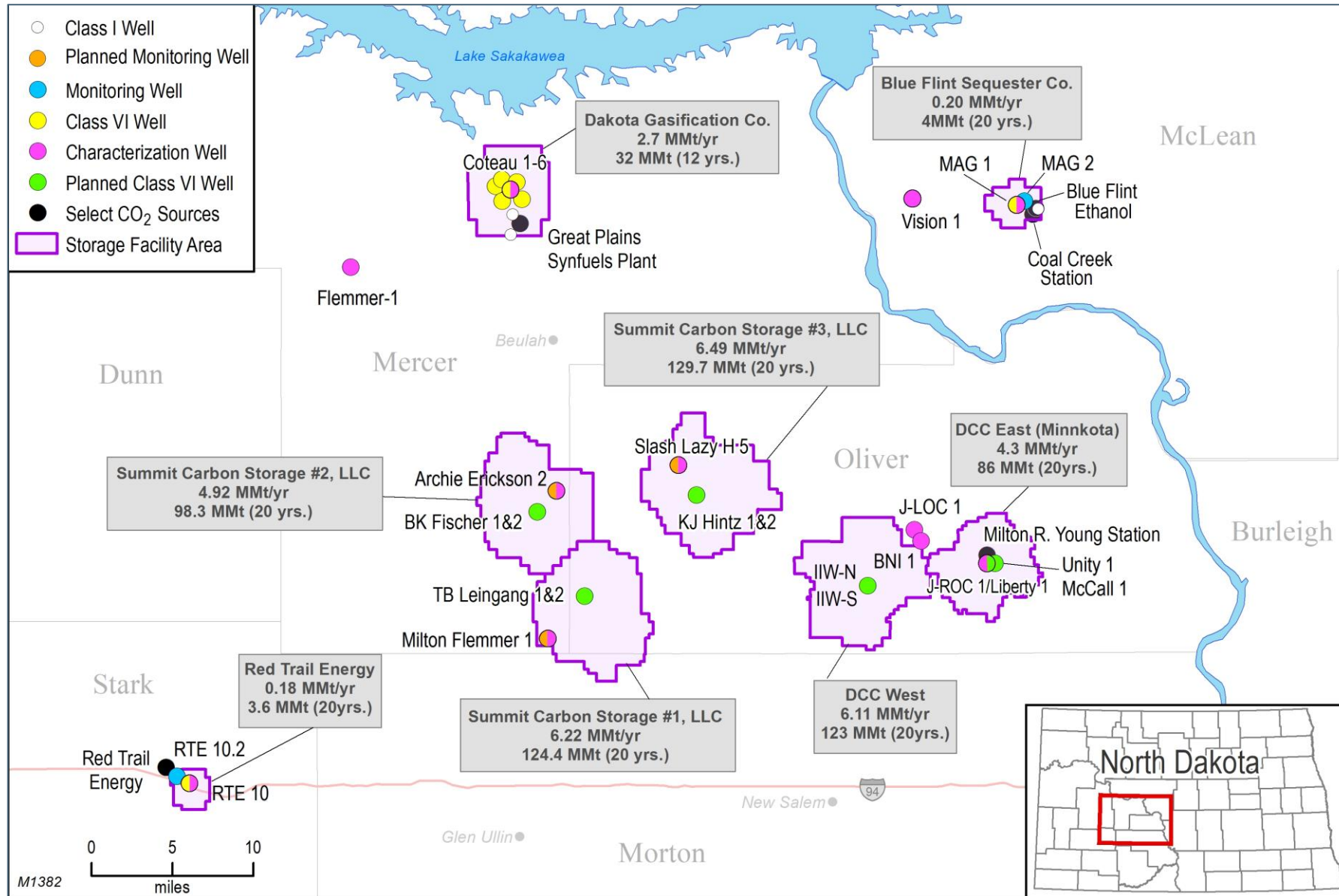
- DCC East (Project Tundra) – Coal power plant: 5 Mty
- DCC West – Coal power plant: 6 Mty
- Summit – Multiple ethanol plants: 18 Mty

Announced

- Rainbow Energy – Coal power plant: ~9 Mty
- Roughrider Hub – Multiple sources
- Cerilon GTL North Dakota



PERMITTED ND SALINE STORAGE PROJECTS



REGIONAL LEADERSHIP

- **Building** on over 20 years of applied research in CCUS.
- **Active** region developing commercial CCUS projects.
- **Engaged** and motivated partners.
- **Engaged** regulators.
- **Catalyst** for CCUS projects in the region.
- **Focused** on infrastructure development strategies.
- **Accelerating** CCUS.
- **Expanding** CO₂ EOR opportunities in the region.





Kevin C. Connors
Assistant Director for Regulatory Compliance
and Energy Policy
kconnors@undeerc.org
701.777.5236

Energy & Environmental
Research Center
University of North Dakota
15 North 23rd Street, Stop 9018
Grand Forks, ND 58202-9018

www.undeerc.org
701.777.5000 (phone)

A wide-angle photograph of a university campus at sunset. The sun is low on the horizon, creating a warm glow. In the foreground, there are trees with yellowing leaves. In the background, there are several large, multi-story brick buildings and a parking lot with many cars.

THANK YOU

Critical Challenges. Practical Solutions.



EERC



UNIVERSITY OF
NORTH DAKOTA



Critical Challenges. Practical Solutions.

ACKNOWLEDGMENT

This material is based upon work supported by the U.S. Department of Energy National Energy Technology Laboratory under Award No. DE-FE0031838.

DISCLAIMER

This presentation was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government, nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.