



FIRST WAVE OF INCENTIVE-DRIVEN CCS PROJECTS IN NORTH DAKOTA

KEY TAKEAWAYS

- The North Dakota Industrial Commission has granted the first three geologic (carbon dioxide) CO₂ storage facility permits through the state's Underground Injection Control (UIC) Class VI Primacy Program.
- Recent momentum in carbon capture and storage (CCS) activity in North Dakota builds on the solid foundation of regional characterization and field validation developed through the Plains CO₂ Reduction (PCOR) Partnership.¹
- The North Dakota Administrative Code integrated with the Class VI Primacy Program provides for regulatory certainty by formalizing the process for:
 - Establishing pore space ownership and rules.
 - Amalgamating storage reservoir pore space.
 - Determining financial responsibility.
 - Establishing long-term trust funds.
 - Facilitating postinjection title transfer and release of liability.
- Incentive programs such as the Internal Revenue Service (IRS) Section 45Q tax credits and Low Carbon Fuel Standard (LCFS) protocols are driving the acceleration of CCS investment in North Dakota.
- This initial wave of projects is informing investment in, and creating the opportunity for, innovation that will enable the next wave of incentive-based CCS projects.

GREAT PLAINS CO₂ SEQUESTRATION PROJECT

FACILITY | Lignite coal gasification plant capable of gasifying 6 MMtpa

TONNAGE | 1.0 to 2.7 MMtpa of CO₂

INJECTOR DESIGN | Up to six injection wells into a single storage reservoir

REGULATORY STATUS

NDIC | March 2022: Class VI permit submitted

OTHER | Within the anticipated CO₂ plume boundary area, 56% of the land surface is reclaimed mining land, creating unique conditions for near-surface and geophysical monitoring techniques.



SUMMIT CARBON SOLUTIONS

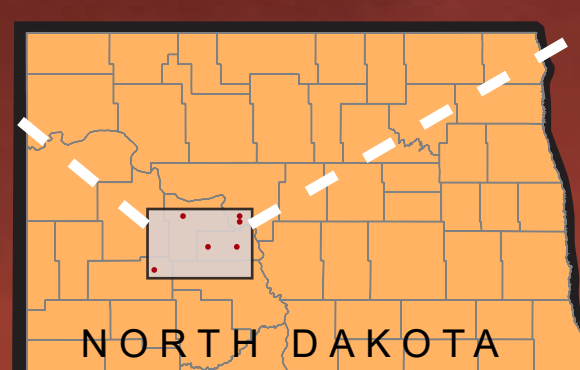
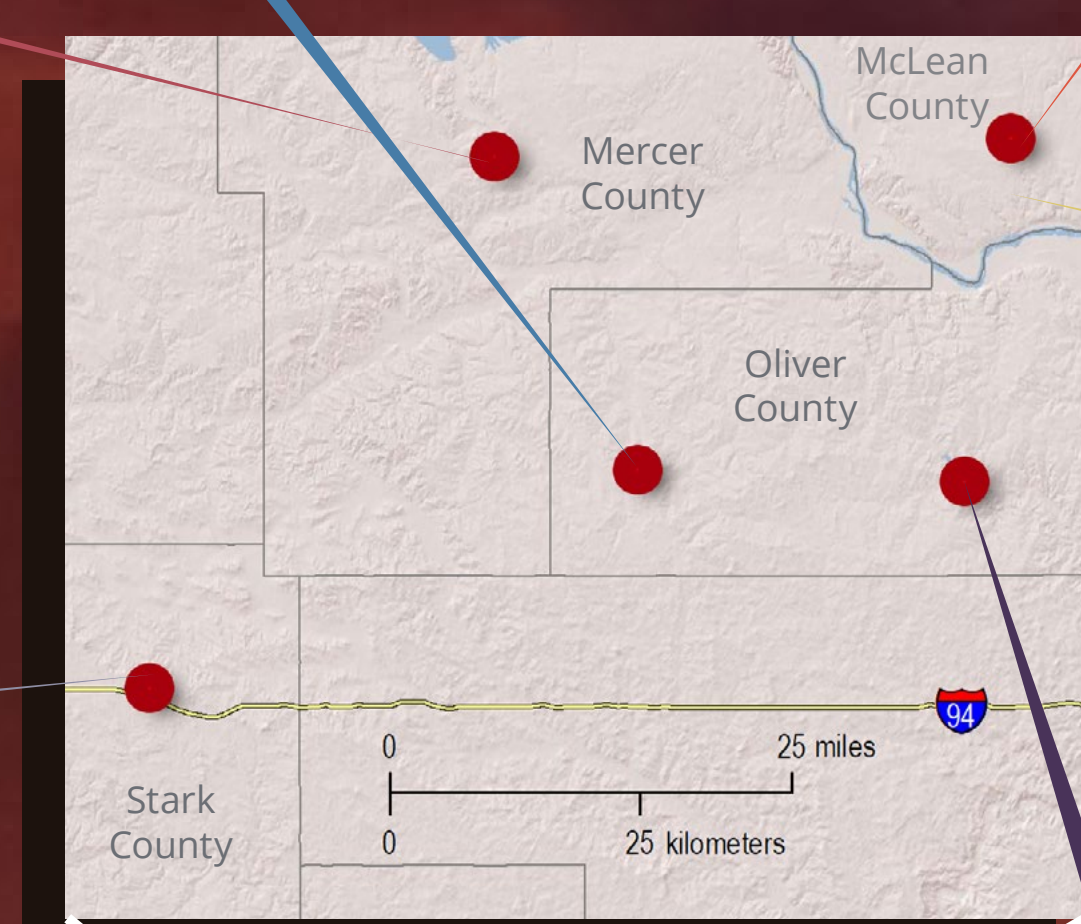
FACILITY | 32 ethanol plants and other facilities in five states

TONNAGE | 8.0 million tonnes per annum (MMtpa) of CO₂; initial pipeline capacity of 12.0 MMtpa, expansion capabilities to handle up to 20.0 MMtpa

INJECTOR DESIGN | Multiple injection wells into stacked storage reservoirs

PROJECT STATUS | Site characterization and design under way to inform Class VI permits and incentive program compliance

OTHER | Largest proposed CCS project to date, one of the first CO₂ storage hubs



COAL CREEK STATION

FACILITY | 1100-MW two-unit minemouth lignite coal-fired power generation facilities

TONNAGE | About 9 MMtpa of CO₂ anticipated

PROJECT STATUS | CO₂ capture pre-FEED study completed on one of the 550-MW units, FEED study under way.

OTHER | Largest coal-fired power plant in North Dakota



MIDWEST AGENERGY

FACILITY | Blue Flint 70-million-gallon dry mill ethanol production plant

TONNAGE | About 200,000 tpa of CO₂

INJECTOR DESIGN | One CO₂ injector into single storage reservoir

PROJECT STATUS | Stratigraphic test well and 3D seismic survey completed; modeling, design, and permitting under way

RED TRAIL ENERGY

FACILITY | 64-million-gallon dry mill ethanol production plant

TONNAGE | 180,000 tpa of CO₂

INJECTOR DESIGN | One CO₂ injector into single storage reservoir

REGULATORY STATUS

NDIC | October 2021: Class VI permit approved
March 2022: Permit to inject approved

OTHER | The DOE, the NDIC Renewable Energy Program, and the PCOR Partnership, provided funding for storage site development and demonstration of novel monitoring techniques.

PROJECT TUNDRA

FACILITY | 734-MW two-unit minemouth lignite coal-fired power plant

TONNAGE | About 3.9 MMtpa of CO₂

INJECTOR DESIGN | Dual injection wells into stacked storage reservoirs

REGULATORY STATUS

NDIC | January 2022: Two Class VI permits approved

EPA | December 2021: MRV plan submitted

OTHER | CarbonSAFE Phase III North Dakota project



¹ Since 2003, the PCOR Partnership with its 200+ current and prior member organizations has been laying the groundwork for permanent, safe, and practical geologic storage of CO₂.

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