Energy & Environmental Research Center (EERC)

Regulatory Framework for Geologic Storage of Carbon Dioxide

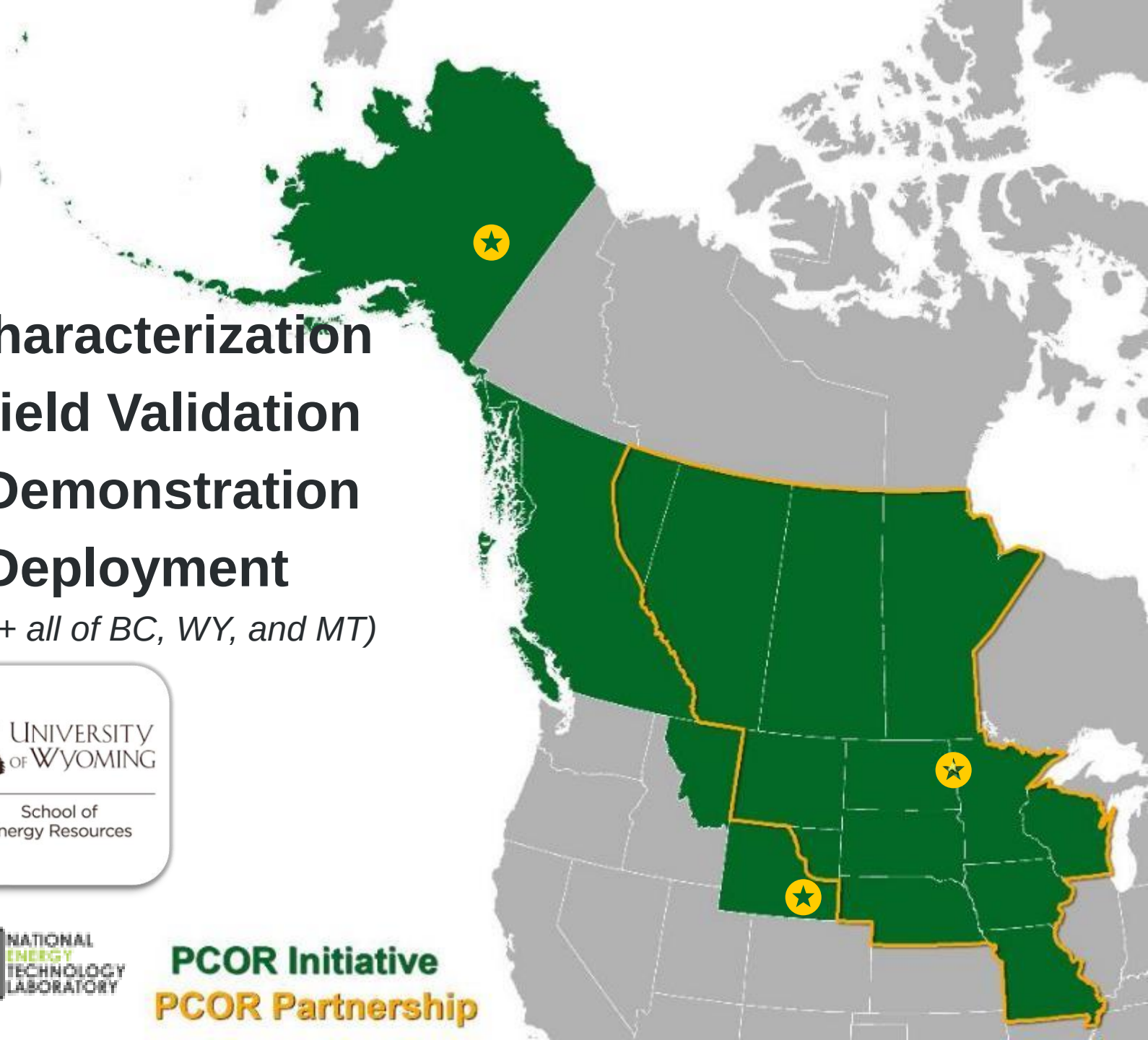
IOGCC Legal and Regulatory Affairs Committee
2022 Annual Meeting
Baltimore, Maryland

Kevin Connors
PCOR Partnership Project Manager
Assistant Director for Regulatory Compliance and Energy Policy

PCOR Partnership

- 2003–2005: **Phase I** – **Characterization**
- 2005–2009: **Phase II** – **Field Validation**
- 2007–2018: **Phase III** – **Demonstration**
- 2019–2024: **Initiative** – **Deployment**

(PCOR region expanded to include AK + all of BC, WY, and MT)



UAF Institute of Northern Engineering
University of Alaska Fairbanks

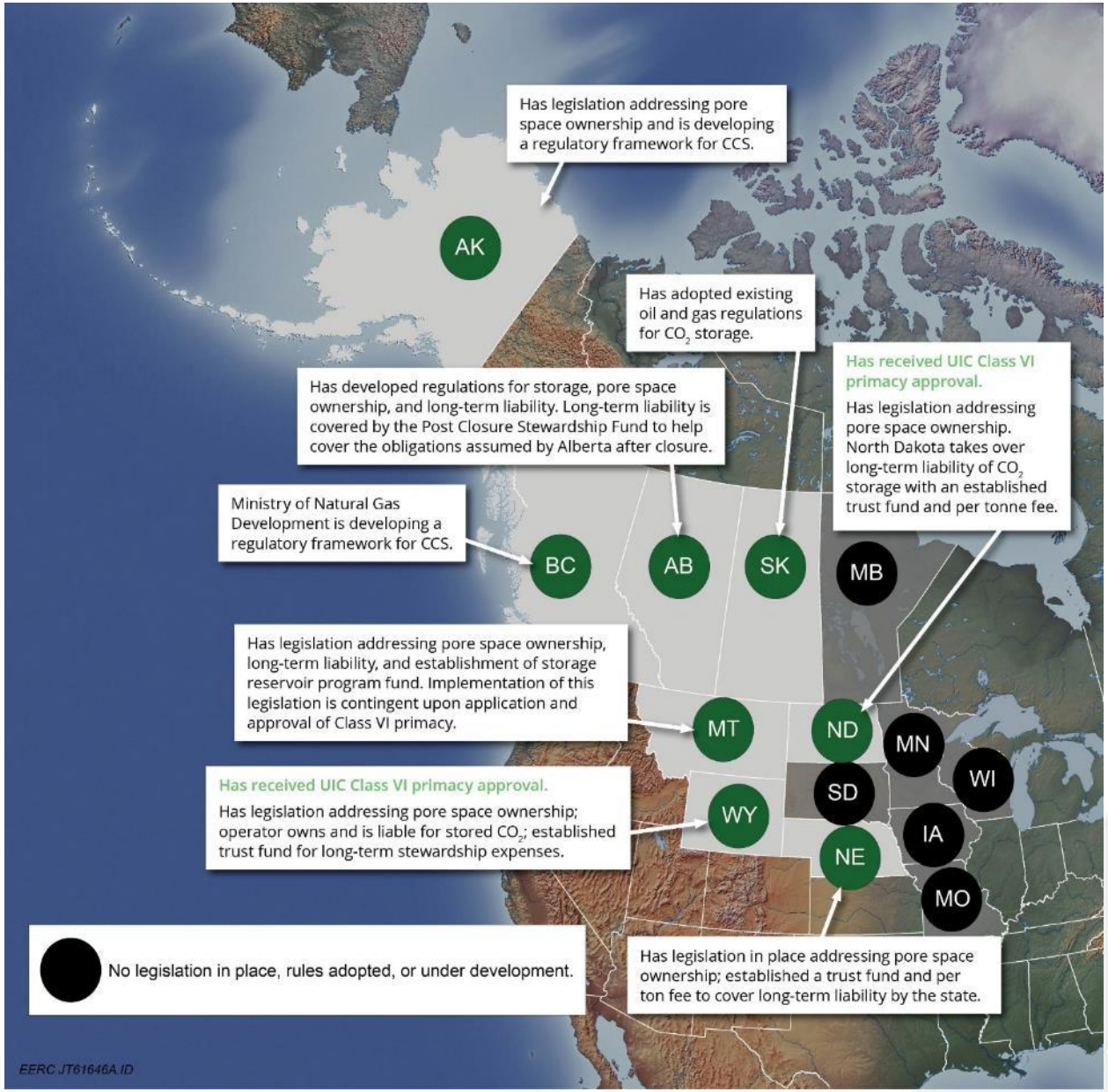
University of Wyoming
School of Energy Resources

EERC | U.S. Department of Energy | National Energy Technology Laboratory

PCOR Initiative
PCOR Partnership

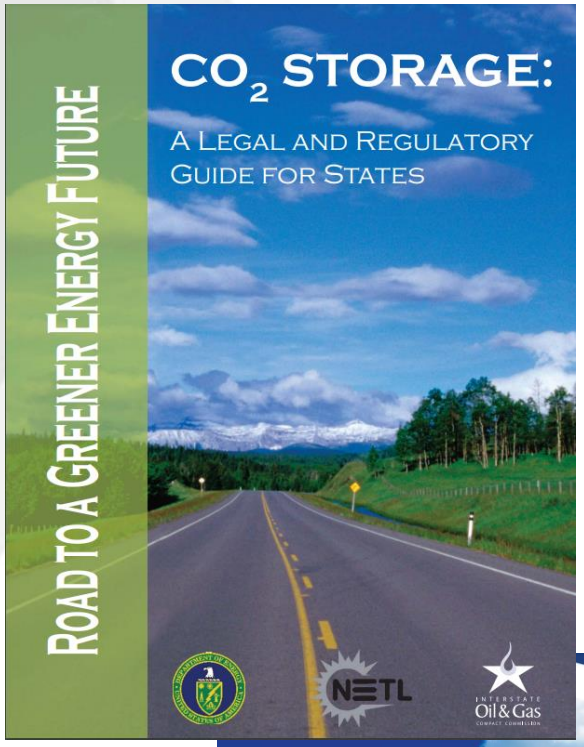
POLICY AND REGULATORY DEVELOPMENTS

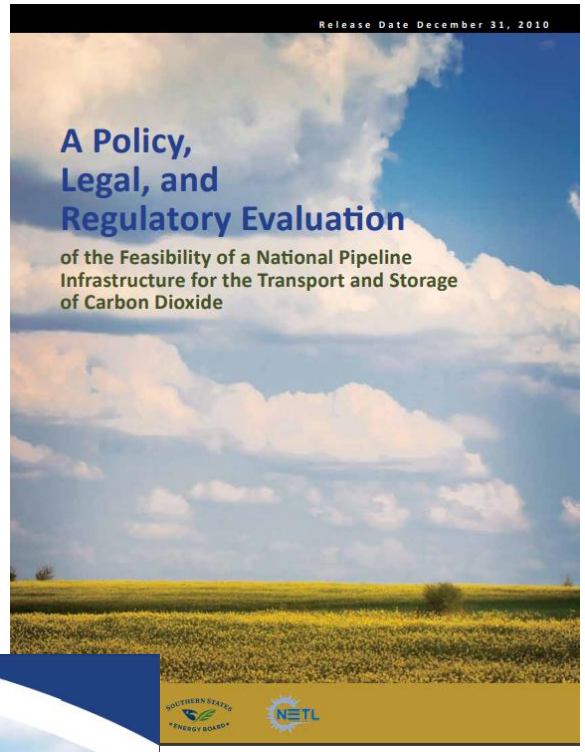
- Pore space Law
- Long-term Responsibility
- Class VI primacy
- Regulatory program implementation
- Pathways to permit approval
- Policy/Regulatory Barriers

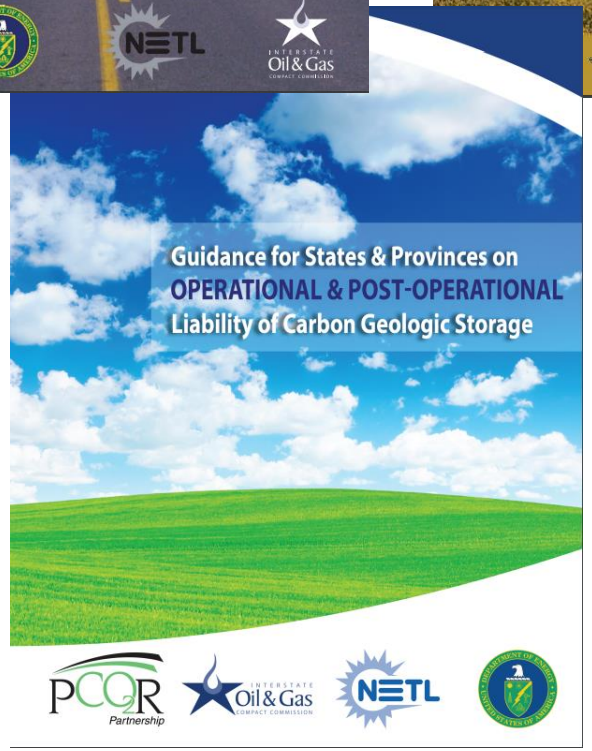


EERC | UND UNIVERSITY OF NORTH DAKOTA | U.S. DEPARTMENT OF ENERGY | NETL NATIONAL ENERGY TECHNOLOGY LABORATORY

IOGCC CARBON GEOLOGIC STORAGE TASK FORCE







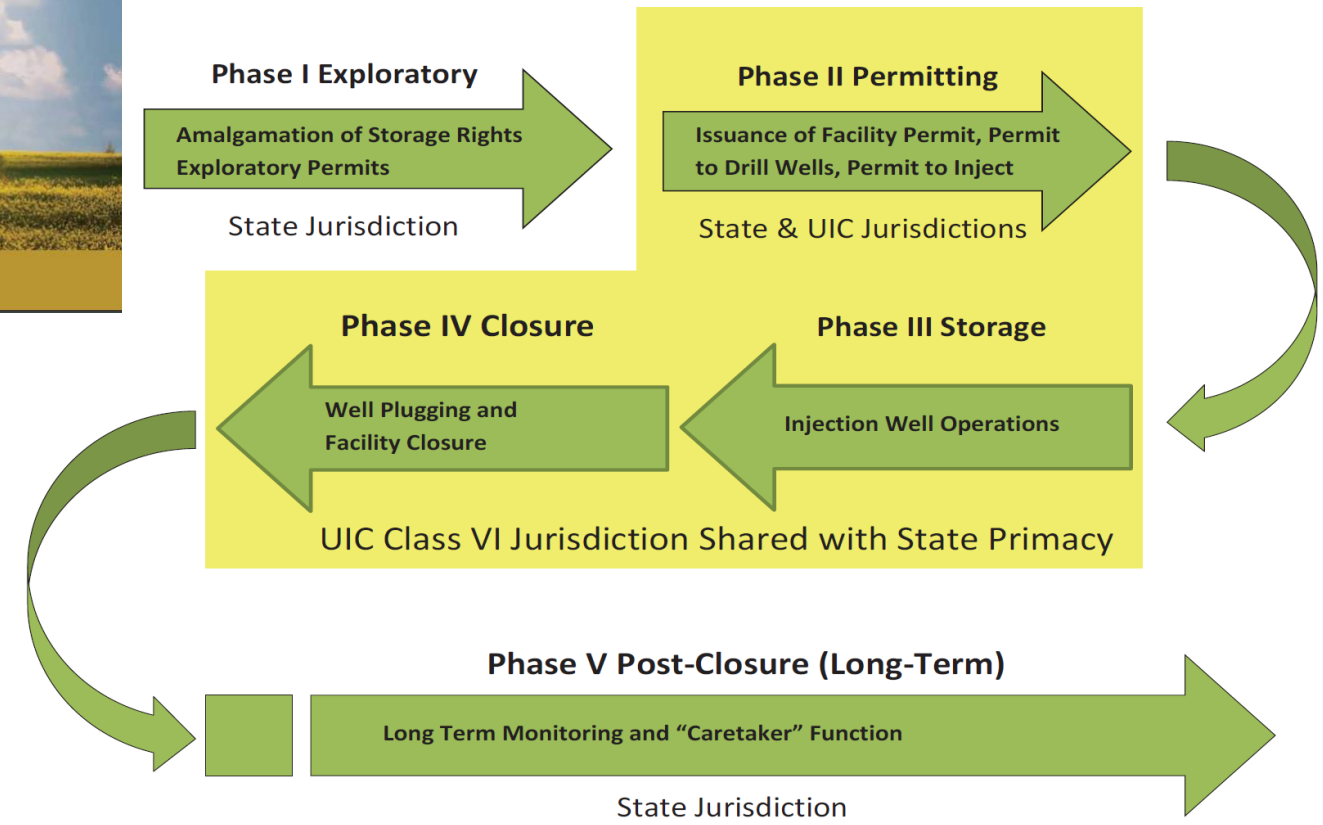


Figure 1-1 CGS Project Flow Diagram
(Yellow boxes show concurrent state and UIC Class VI jurisdiction in Phases II, III, IV. Phase I and V show exclusive state jurisdiction.)

Created by the IOGCC Task Force

GEOLOGIC STORAGE OF CARBON DIOXIDE

- It is public interest to promote geologic storage of CO_2 in order to reduce anthropogenic emissions.
- CO_2 is a valuable commodity.
- The state's pore space should be regulated and managed as a resource under the resource management philosophy as opposed to a waste disposal regulatory framework.

Resource Management Framework	Waste Disposal Framework
A resource management framework allows for the regulatory complexities that accompany CO_2 storage to be integrated into a unified regulatory framework and proposes a "public and private sector partnership." 1) Environmental protection 2) Ownership and management of pore space 3) Maximize storage capacity 4) Long-term liability	• Sidesteps the public's role in both the creation of CO_2 and the mitigation of its release into the atmosphere. • Places the burden solely on Industry to rid itself of "waste" from which the public must be "protected." • Lacking citizen buy-in with respect to responsibility for the problem as well as the solution will have a negative impact on CO_2 storage as a viable methodology for reducing anthropogenic CO_2 emissions.

RESOURCE MANAGEMENT FRAMEWORK

- It is in the public interest to promote
- Benefits the state
- Prevent waste, maximize ultimate recovery of oil and gas, protect correlative rights
- CO_2 is valuable commodity

CARBON DIOXIDE UNDERGROUND STORAGE
CHAPTER 38-22

38-22-01. POLICY. It is in the public interest to promote the geologic storage of carbon dioxide. Doing so will benefit the state and the global environment by reducing greenhouse gas emissions. Doing so will help ensure the viability of the state's coal and power industries, to the economic benefit of North Dakota and its citizens. Further, geologic storage of carbon dioxide, a potentially valuable commodity, may allow for its ready availability if needed for commercial, industrial, or other uses, including enhanced recovery of oil, gas, and other minerals. Geologic storage, however, to be practical and effective requires cooperative use of surface and subsurface property interests and the collaboration of property owners. Obtaining consent from all owners may not be feasible, requiring procedures that promote, in a manner fair to all interests, cooperative management, thereby ensuring the maximum use of natural resources.

Source: N.D. Century Code.

CONTROL OF GAS AND OIL RESOURCES
CHAPTER 38-08

38-08-01. DECLARATION OF POLICY. It is hereby declared to be in the public interest to foster, to encourage, and to promote the development, production, and utilization of natural resources of oil and gas in the state in such a manner as will prevent waste; to authorize and to provide for the operation and development of oil and gas properties in such a manner that a greater ultimate recovery of oil and gas be had and that the correlative rights of all owners be fully protected; and to encourage and to authorize cycling, recycling, pressure maintenance, and secondary recovery operations in order that the greatest possible economic recovery of oil and gas be obtained within the state to the end that the landowners, the royalty owners, the producers, and the general public realize and enjoy the greatest possible good from these vital natural resources.

Source: N.D. Century Code.

NORTH DAKOTA 2009 LEGISLATION

- Senate Bill 2095 – Effective July 2009 Established geologic storage of CO_2 statute
  - Granted regulatory authority to the North Dakota Industrial Commission's Oil and Gas Division
  - Created the Carbon Dioxide Trust Fund.
  - Created the Carbon Dioxide Storage Facility Administrative Fund
  - Addressed long-term responsibility
- Senate Bill No. 2139 – Effective April 2009
  - Granted title of pore space to the owner of the overlying surface estate
  - Severing pore space prohibited, leasing pore space not a prohibited severance

July 1, 2022

Dear Administrator Nance:

On May 31, 2022, the Texas Railroad Commission submitted to Region VI a pre-application package relating to delegation of primacy for a Class VI program under the Underground Injection Control (UIC) Program. EDF is writing to ask that you not process a primacy application from the Commission until after the conclusion of the 2023 Texas legislative session.

The reason for this request is two-fold:

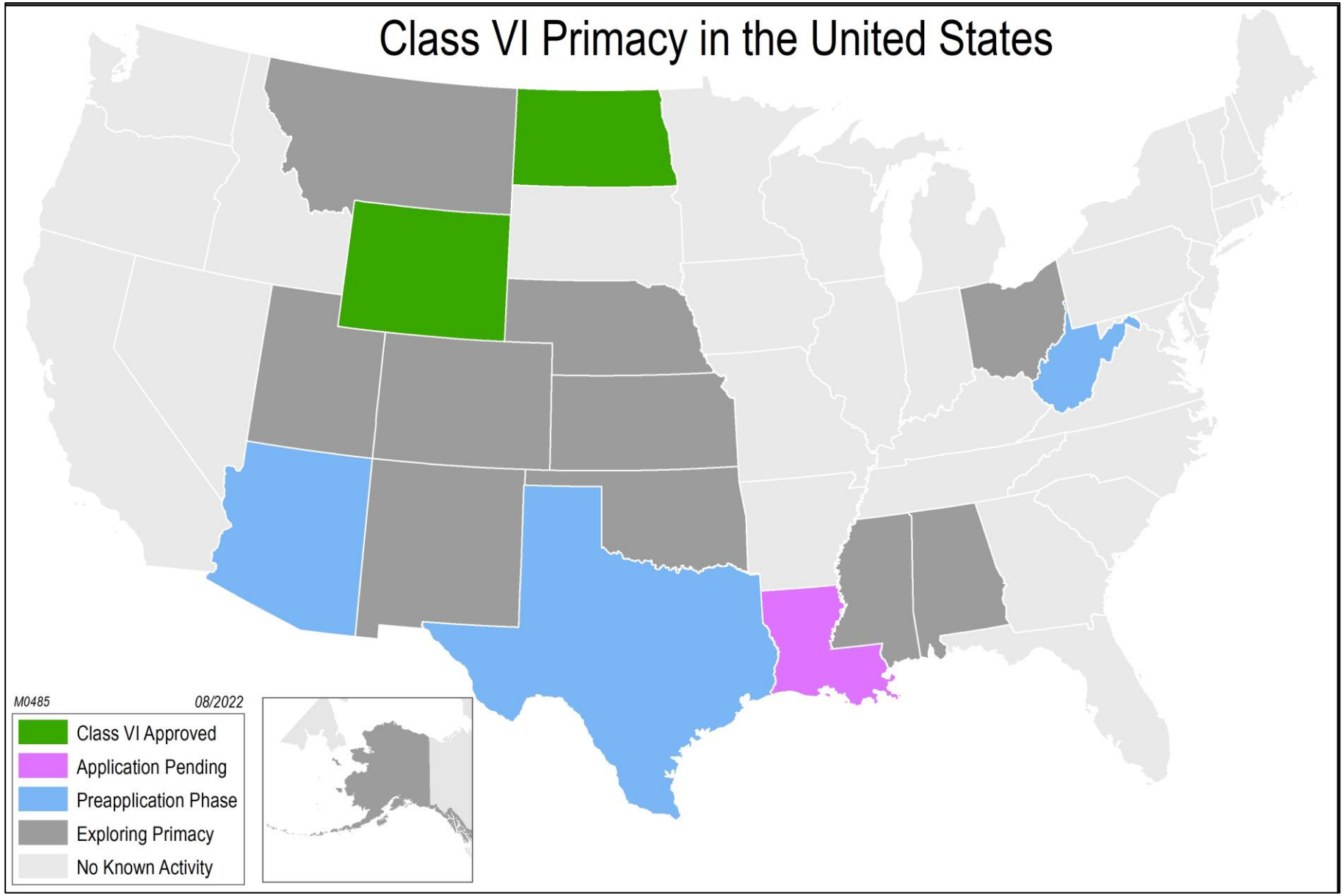
1. On April 13, 2022, EDF submitted the attached comments to the White House Council on Environmental Quality in response to draft guidelines for federal agencies regarding CCS projects. You will note in section 5 that EDF called on EPA to "assess the legal regimes of states that reduce the liabilities of storage operators to determine whether a state has created moral hazard and to deny or revoke primacy for such states." We also recommended that DOE proceed cautiously if at all to award funding to CCS projects in states that adopt such statutes.
2. As made clear in EPA's Class VI preamble, federal UIC rules hold operators responsible for certain harms that manifest even after site closure. EDF believes that states that change this status quo are creating a regulatory landscape inconsistent with EPA's. In the past, the Texas Legislature has resisted calls to exempt CO2 storage operators from liability. In fact, Texas adopted a statute that provides that storage operators in state waters will REMAIN responsible for their actions. However, EDF understands that several major oil companies are planning to ask the state legislature to relieve operators of liability during the 2023 session and believes there is a very real chance that Texas will do so.

Absolving operators of liability not only diverges from existing EPA practice, but also significantly weakens incentives for good performance – threatening both the integrity of carbon sequestration projects and further damaging public confidence in this activity. As such, EDF appreciates your serious consideration of this request to delay review until there is clarity on Texas's approach to this matter.

Respectfully,

Scott Anderson
Senior Director, Energy Transition
Environmental Defense Fund
512-691-3410

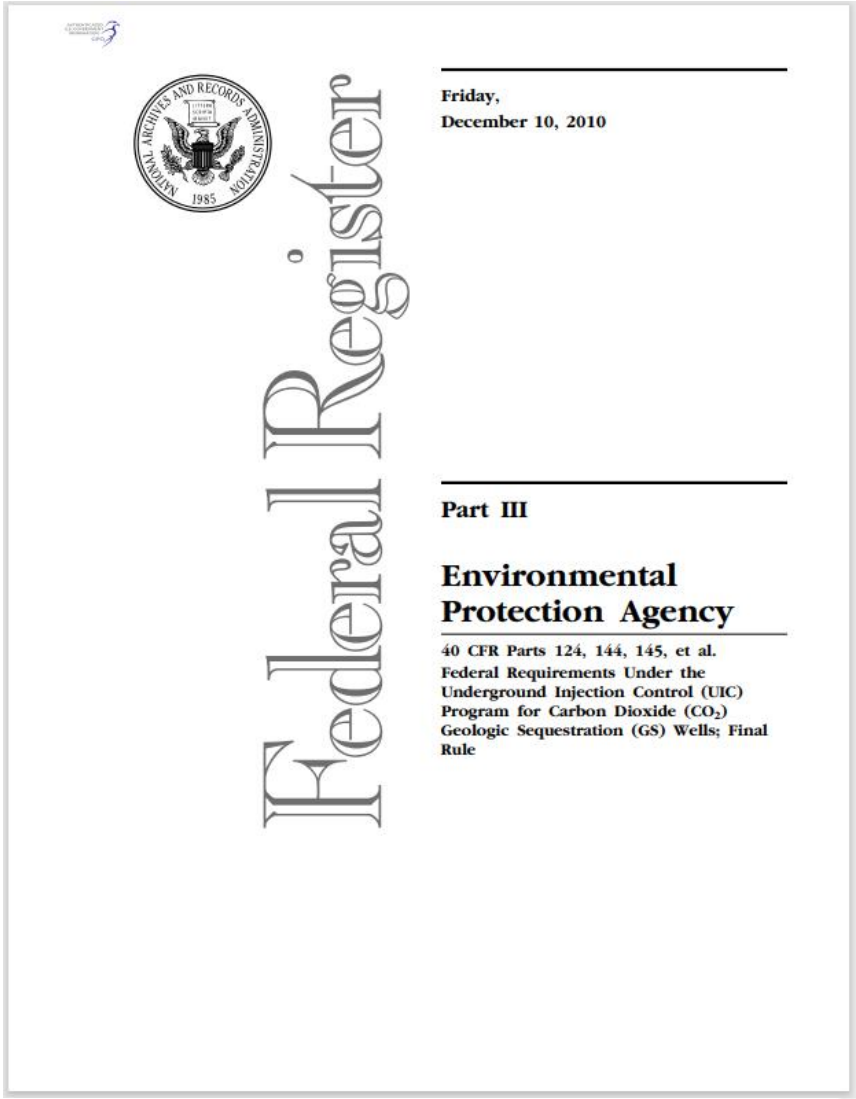
CURRENT CLASS VI PRIMACY ACTIVITY



https://www.epa.gov/uic/primary-enforcement-authority-underground-injection-control-program-0

GEOLOGIC STORAGE PERMITS IN NORTH DAKOTA

EPA believes that States are in the best position to implement UIC–GS programs, and by allowing for independent Class VI primacy, EPA encourages States to take responsibility for implementation of Class VI regulations. The Agency's UIC program believes that this may, in turn, help provide for a more comprehensive approach to managing GS projects by promoting the integration of GS activities under SDWA into **a broader framework for States managing issues related to CCS that may lie outside the scope of the UIC program or other EPA programs.** This would harness the unique efficiencies States can offer to promote adoption of GS technology that incorporates issues in the broader scope of CCS, while ensuring that USDWs are protected through the UIC regulatory framework. Allowing States to apply only for Class VI primacy will also shorten the primacy approval process. EPA's willingness to accept independent primacy applications for Class VI wells applies only to Class VI well primacy and does not apply to any other well class under SDWA section 1422 (i.e., I, III, IV, and V).
https://www.govinfo.gov/content/pkg/FR-2010-12-10/pdf/2010-29954.pdf
(page 77242)


Federal Register

Friday,
December 10, 2010

Part III

Environmental Protection Agency

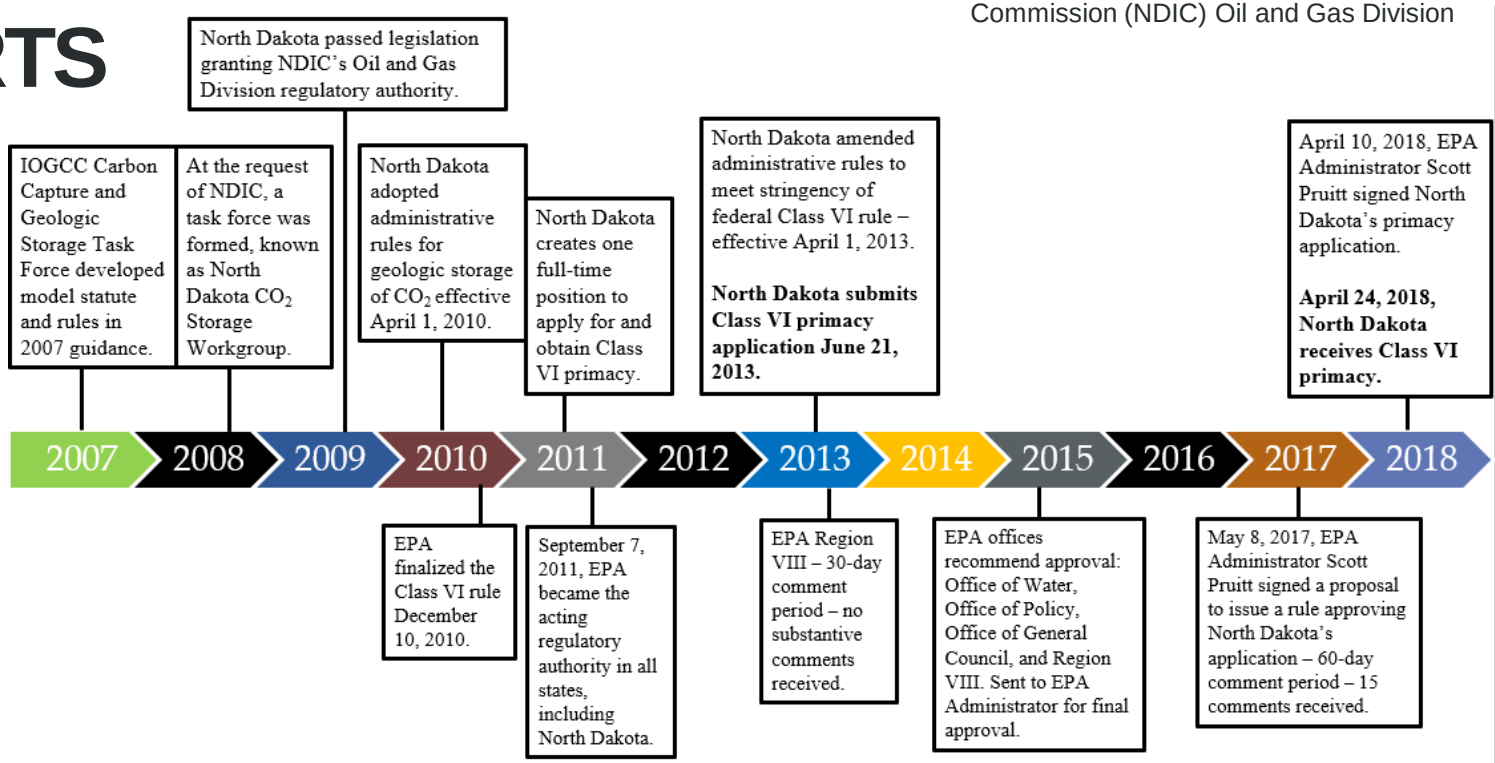
40 CFR Parts 124, 144, 145, et al.
Federal Requirements Under the Underground Injection Control (UIC) Program for Carbon Dioxide (CO_2) Geologic Sequestration (GS) Wells; Final Rule

CLASS VI PRIMACY EFFORTS

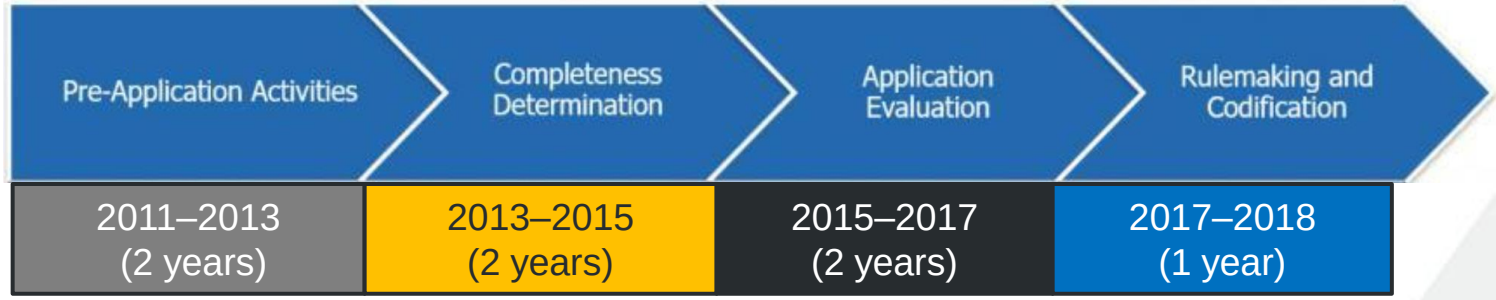
Establishment of State Authority

- **Geologic Storage of Carbon Dioxide**
  Multiyear effort to pass all-encompassing state legislation
- **Preapplication Activities**
  Approximately 2 years (690 days)
  - Crosswalk stringency demonstration
  - State rulemaking 10–12 months
  - Primacy application package
- **Completeness Determination**
  Approximately 2 years
- **Application Evaluation**
  Approximately 2 years
- **Rulemaking and Codification**
  351 days
- **State Primacy Approval**
  Approximately 5 years (1768 days)

Created by the North Dakota Industrial Commission (NDIC) Oil and Gas Division



Created by the USEPA



Wyoming 2 years and 7 months (943 days)

CLASS VI PRIMACY APPLICATION

UIC Program regulations at 40 CFR part 145.22 identify six elements of a UIC primacy application or substantial program revision.

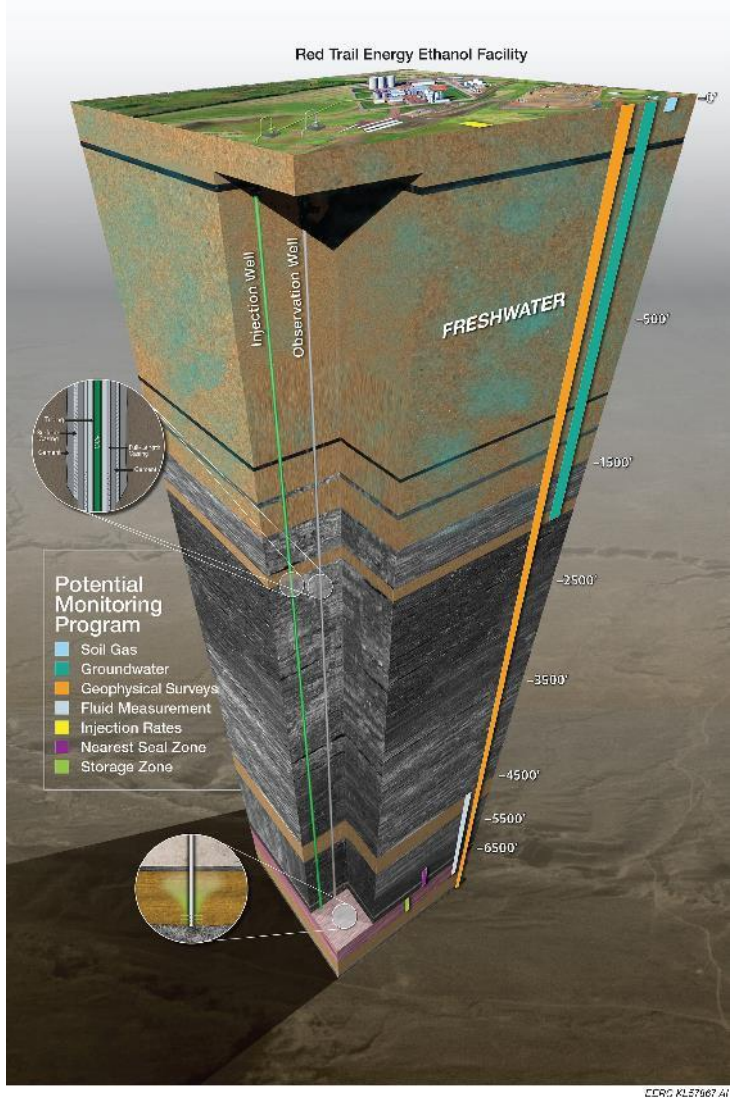
1. Governor's Letter
2. Program Description
3. Attorney General's Statement
4. Memorandum of Agreement (MOA) between the State and EPA Regional Administrator
5. Copies of applicable State Statutes and Regulations
6. Documentation of State public participation process

PERMITTING GEOLOGIC STORAGE OF CARBON DIOXIDE

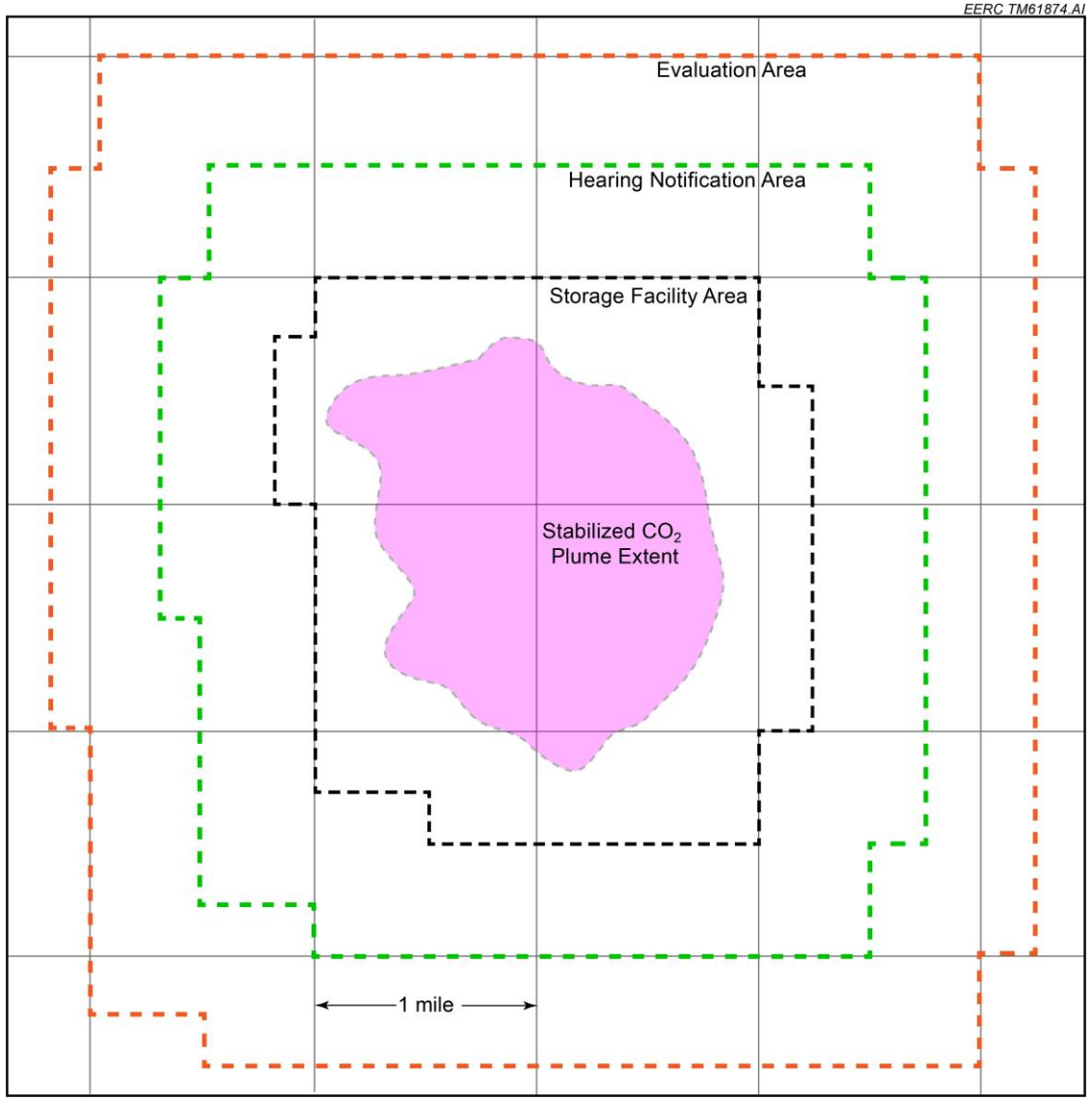
STORAGE FACILITY PERMIT

North Dakota CO_2 Storage Facility Permit (Class VI) Checklist

- ❑ Pore Space Access
- ❑ Geologic Exhibits
- ❑ Geologic Model and Simulations
- ❑ Area of Review (AOR)
- Supporting Plans
  - ❑ Testing and Monitoring Plan
  - ❑ Postinjection Site and Facility Closure Plan
  - ❑ Emergency and Remedial Response Plan
  - ❑ Worker Safety Plan
  - ❑ Well Casing and Cementing Program
  - ❑ Plugging Plan
  - ❑ Financial Assurance Demonstration Plan
- ❑ Injection Well and Storage Reservoir Information



PORE SPACE AMALGAMATION



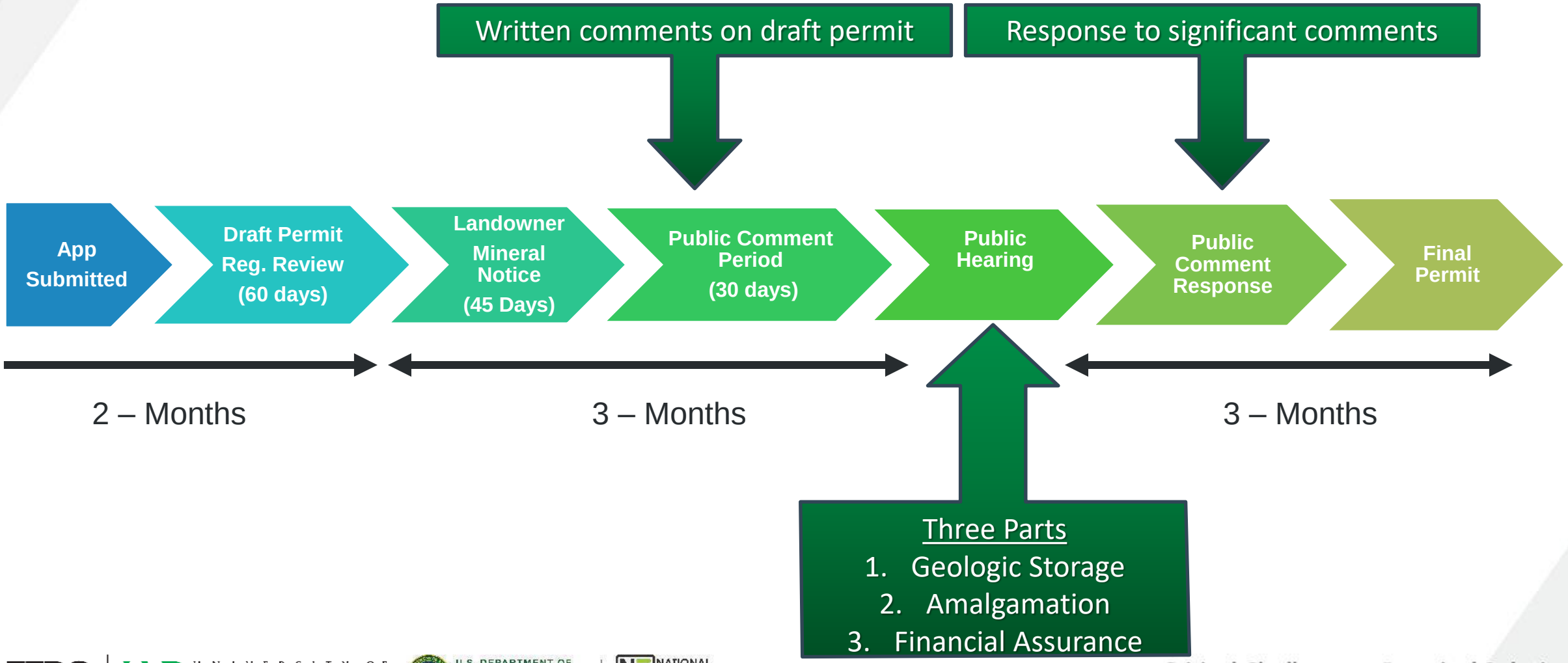
GEOLOGIC STORAGE PERMITS IN NORTH DAKOTA

Red Trail Richardton Ethanol Broom Creek Storage Facility No. 1
– Approved October 19, 2021

Minnkota Center MRYS Broom Creek Storage Facility #1
Minnkota Center MRYS Deadwood Storage Facility #1
Approved January 21, 2022

8-month Review and Approval Process

STORAGE FACILITY PERMIT TIMELINE



SUMMARY

- It starts with primacy and states taking the lead in regulating all aspects of carbon dioxide storage.
  - Overlays such as forced pooling, release of long-term regulatory responsibility, and title transfer incentivizes and enables storage projects.

- Oil and gas mineral resource policy is the most logical approach for CCS. (i.e., resource management regulatory philosophy).

- Geologic CO2 storage (i.e., dedicated storage) and CO_2 EOR (associated storage) can follow a very similar permitting process in primacy states.

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THANK YOU

Critical Challenges. Practical Solutions.

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