

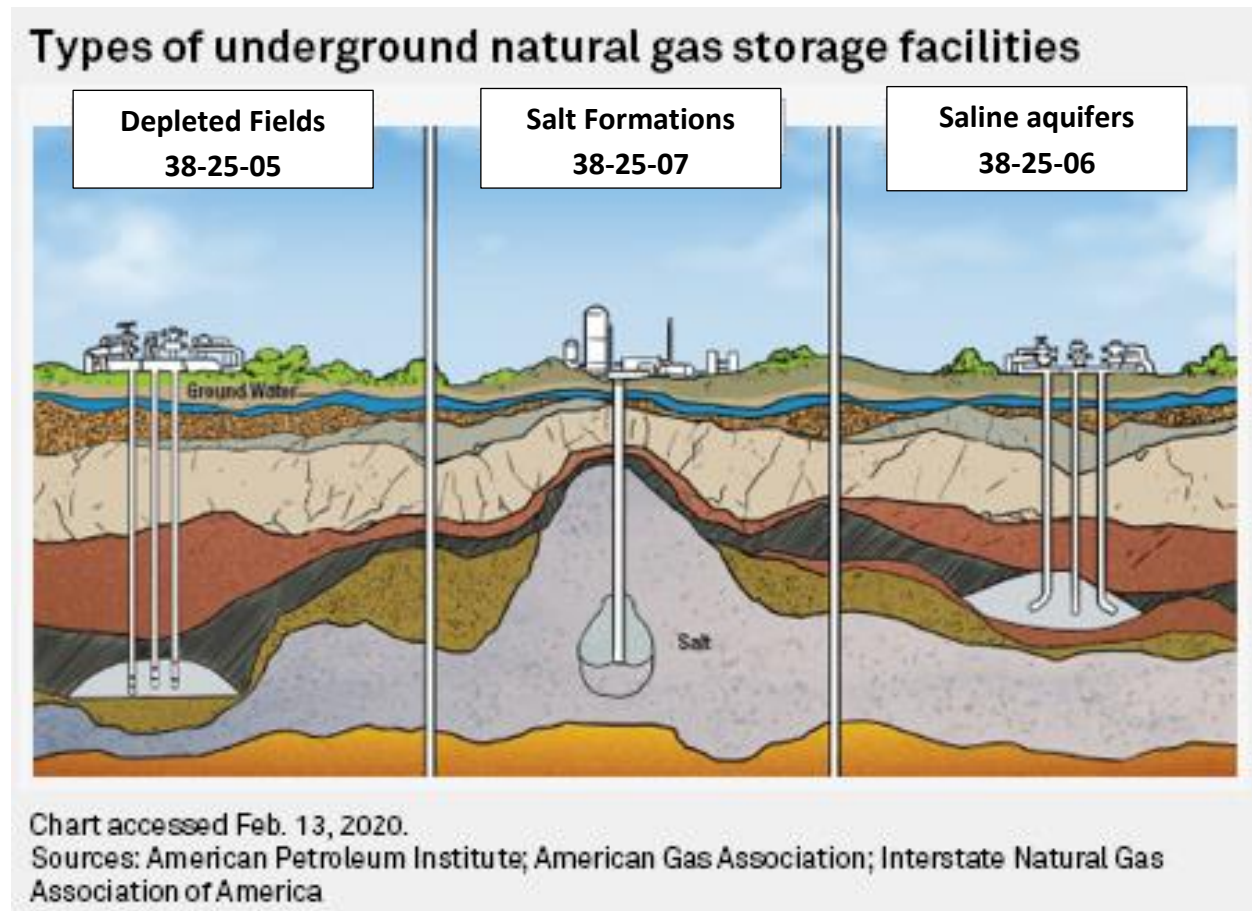
Testimony of Lynn D. Helms
Director, North Dakota Industrial Commission Department of Mineral Resources
March 4, 2021
House Energy and Natural Resources Committee
SB 2065

The North Dakota Industrial Commission (NDIC) pre-filed SB 2065 and urges a do pass of the engrossed version with Senate amendments.

This bill removes numerous uncertainties surrounding the rights of mineral developers, pore space owners, and mineral owners to utilize pore space for underground storage of oil, natural gas liquids, and natural gas.

The bill now creates a new chapter instead of incorporating new language into NDCC 38-08-04 and Section 2 provides the required definitions. This chapter mirrors NDCC 38-22 which was adopted in 2009 and has become the national model for storage of carbon dioxide .

I would like to offer the following regarding underground storage natural gas:



The EERC has studied the potential for produced gas storage in saline aquifers and determined that it is technically and economically feasible in North Dakota based on computer simulations:

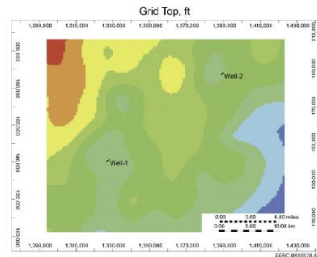


Figure 8. Map view of the simulation model showing the injection well locations and depth of the Broom Creek Formation top. North is toward the top of the image.

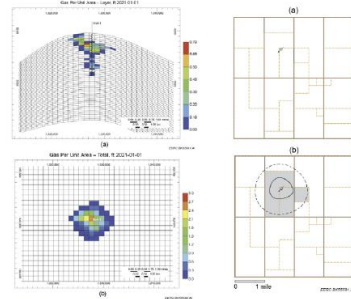


Figure 11. Cross-sectional view (a) and (b) of one simulated gas storage cavern after 7 years of injection at 10 MMscf/day rate for the cavern area is contained area and for each of the caverns in the reservoir model. The vertical exaggeration is 100x to 75x.

Produced gas injector surrounded by 1200-por cell storage units (DSCs) outlined by hand-drawn division (dashed rectangles).

Produced gas storage facility area (solid oval) represents the extent of pore space that will be occupied by the injected and geologic storage of produced gas over the life of the project.

Gray area represents hand-drawn to be included in the pore space simulation process.

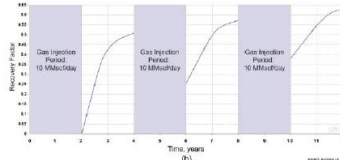
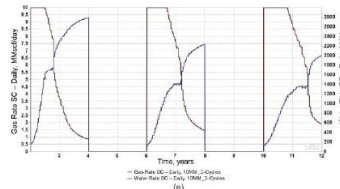
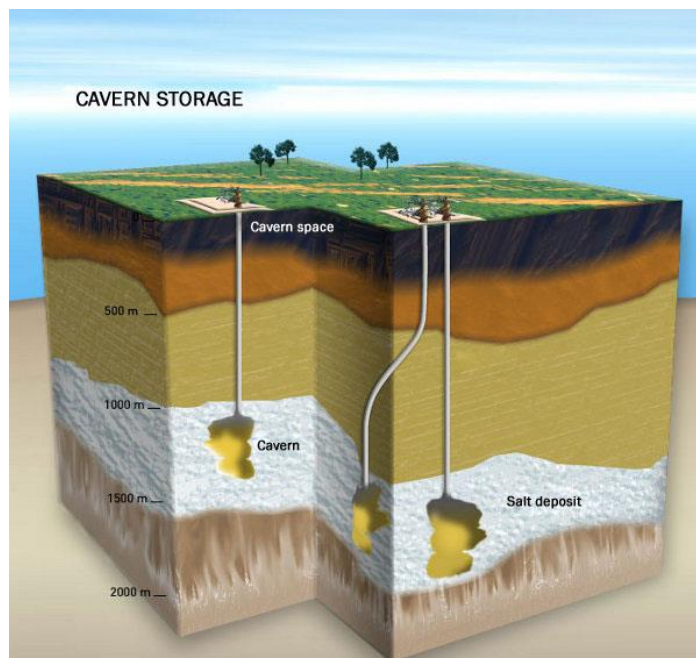


Figure 12. Gas and water production rates following 2 years of gas injection (a) and gas recovery factors (b) for a cyclic gas injection and recovery scenario.

	cycle 1	cycle 2	cycle 3
MCFD Inj	10,000	10,000	10,000
Days/Yr	365	365	365
Years	4	4	4
MCF Inj	7,300,000	7,300,000	7,300,000
RF	50%	57%	63%
MCF Prod	3,650,000	4,161,000	4,599,000
Investment	\$15,700,000		
\$/MCF	\$2.15		
Oper Cost	\$7,000,000	\$7,000,000	\$7,000,000
Total Cost	\$22,700,000	\$7,000,000	\$7,000,000
\$/MCF	\$6.22	\$1.68	\$1.52
			\$2.96

The EERC was contracted by NDIC to study the feasibility of developing salt caverns for hydrocarbon storage in western North Dakota and to identify topics needing clarification with regards to geologic storage of oil, natural gas liquids, and natural gas. EERC provided a 94 page STUDY TO DETERMINE THE FEASIBILITY OF DEVELOPING SALT CAVERNS FOR HYDROCARBON STORAGE IN WESTERN NORTH DAKOTA concluding:

- salt cavern storage of hydrocarbons is technically feasible in North Dakota
- salt cavern storage is a necessary infrastructure to support petrochemical processing
- the following topics need clarification with regards to geologic storage



- 1) Add clarifying language that grants NDIC-OGD the authority to require non-consenting pore space owners to be included in a gas storage facility (i.e. amalgamation of property interests). (38-25-08).
- 2) Clarify the percentage of pore space for which an operator is required to obtain consent in order to establish a temporary gas storage reservoir. (Set at 55% in 38-25-05, 38-25-06, and 38-25-07 to match current oil and gas unitization statute).
- 3) Add clarifying language that NDCC 47-31 Subsurface Pore Space Policy is only applicable to non-mineral-bearing geologic formations (i.e. saline formations). To use a mineral-bearing formation to store produced gas, the operator would be required to obtain consent from only the mineral owners within the gas storage reservoir, and not the pore space owners and which make the pore space ownership required equal to the mineral interest ownership (38-25-05 requires 55% of both pore space and oil & gas mineral owners to match current oil and gas unitization statute). Typically, storage in a depleted reservoir will result in enhanced oil or enhanced gas recovery as well as storage benefits.
- 4) Modify the tax law to lengthen the period of the tax exemption or add language to the law that ties the length of the tax exemption period directly to the gas storage period. (This is not under NDIC jurisdiction. Interested parties agreed that this is not a barrier at this time, but it may require future amendment of 57-51-02.2 and 57-51-02.6).
- 5) Develop royalty payment rules that are specific to natural gas storage operations, both in saline formations and depleted oil & gas reservoirs. New rules, or modifications to existing rules, should specifically address the point at which royalties will be paid on natural gas that is injected into a designated natural gas storage facility. (38-25-10).
- 6) Add clarifying language related to the “artificially created” pore space and the applicability of the rules to solution mined salt caverns. (38-25-07).
- 7) Provide clarity that the mineral owner owns the solution mined cavern, granting storage ownership rights to the mineral owner. (38-25-07 requires 55% of both pore space and salt mineral owners).
- 8) Amend the NDIC Produced Gas Storage Permitting Guideline to include NGL storage and specifically identify NGL storage as non-transportation-related gas storage. (38-25-01).
- 9) Amend the NDIC Produced Gas Storage Facility Permit Application Guideline to include NGL salt cavern storage, with a specific section on the construction and operation of brine storage ponds that dovetails with the NDGS regulatory framework. (NDIC is opposed to this and feels that alternatives such as salt cavern storage of the working brine should be investigated).

Section 1 creates NDCC 15-05-09.1 to grant authority for the board of university and school lands to lease its surface, pore space, and mineral rights for underground storage.

38-25-02, 38-25-03, 38-25-04 grant permitting, regulation, inspection, bonding, permit transfer, and public hearing authority to the NDIC.

38-25-09 establishes the ownership of injected oil or gas.