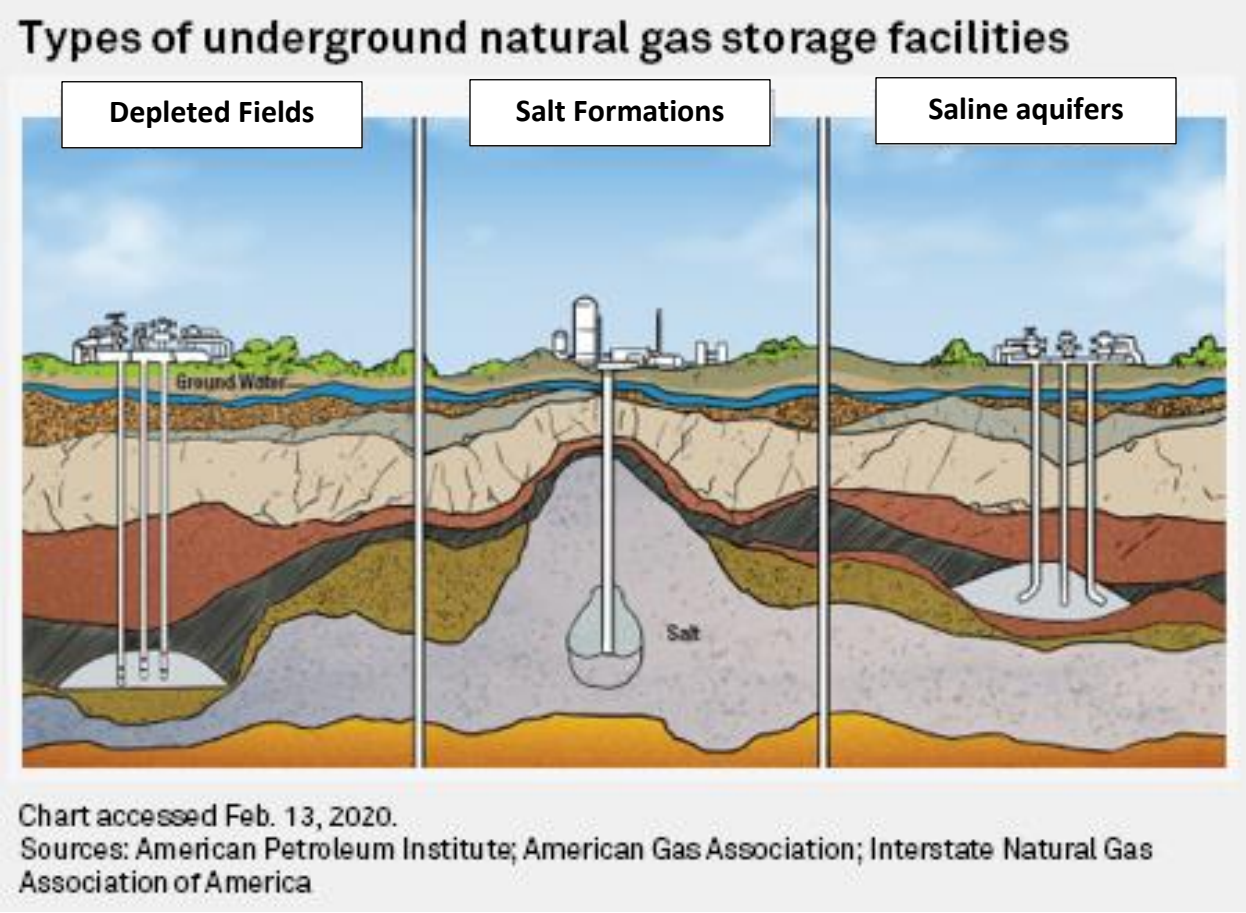
Testimony of Lynn D. Helms
Director, North Dakota Industrial Commission Department of Mineral Resources
January 8, 2021
Senate Energy and Natural Resources Committee
SB 2065

The North Dakota Industrial Commission (NDIC) prefiled SB 2065 and urges a do pass.

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

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:

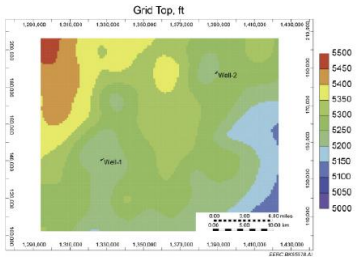


Figure 8. Map view of the simulation model showing the injection well locations and depth of the Broom Creek Formation top. North is toward the top of the image.

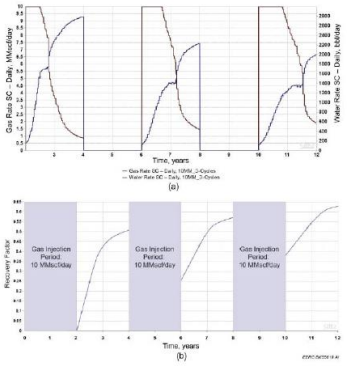


Figure 12. Gas and water production rates following 2 years of gas injection (a) and gas recovery factors (b) for a cyclic gas injection and recovery scenario.

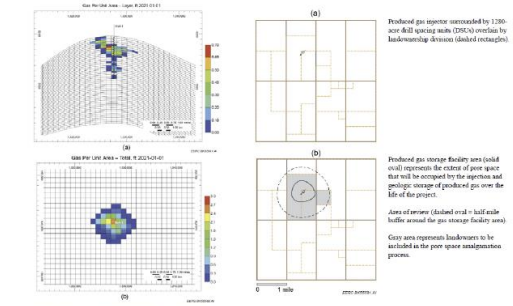


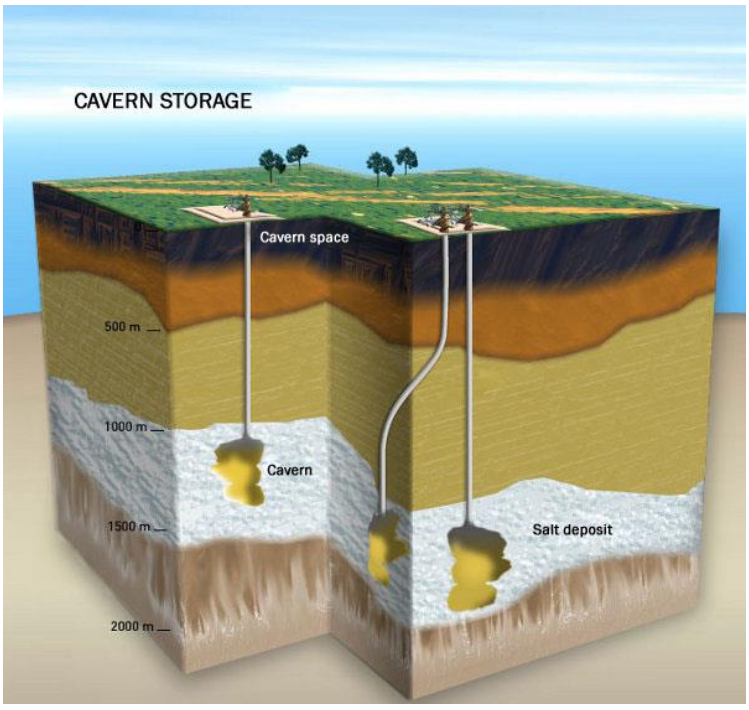
Figure 11. Cross-sectional view (a) and aerial view (b) of one simulated gas plume after 2 years of injection at 10 MMscf/day (note that the aerial extent is a summation derived from each of the vertical layers in the reservoir model). The vertical exaggeration in image "a" is 75×.

Figure 13. Visual representation of pore space amalgamation considerations with respect to landowners within a given gas storage project area.

	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	12,410,000
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	$36,700,000
$/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 the following:

Salt cavern storage of hydrocarbons is technically feasible in North Dakota and is a necessary infrastructure to support petrochemical processing:



The following topics need clarification with regards to geologic storage of oil, natural gas liquids, and natural gas:

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). See page 2 lines 5-7, lines 8-10, and line 28.**
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. See page 2 lines 8-10.**
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 (see page 2 lines 11-16) and which make the pore space ownership required equal to the mineral interest ownership (see page 2 lines 8-10). 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. See ?? bill ???? that amends 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. This is typically a private contract matter, however NDCC 38-08-09.8 contains the following language "Property rights, leases, contracts, and all other rights and obligations must be regarded as amended and modified to the extent necessary to conform to the provisions and requirements of sections 38-08-09.1 through 38-08-09.16 and to any valid and applicable plan of unitization or order of the commission made and adopted pursuant hereto, but otherwise to remain in full force and effect." that should be amended into this bill. This is not under NDIC jurisdiction.**
6) **Add clarifying language related to the "artificially created" pore space and the applicability of the rules to solution mined salt caverns. NDIC feels this is covered in the definition of pore space NDCC 38-11.1-03.**
7) **Provide clarity that the mineral owner owns the solution mined cavern, granting storage ownership rights to the mineral owner. NDIC is opposed to this.**
8) **Amend the NDIC Produced Gas Storage Permitting Guideline to include NGL storage and specifically identify NGL storage as non-transportation-related gas storage. I offer an amendment: Page 1, line 21 after oil insert ", natural gas liquids,"**
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.**