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Good morning, Chairman Lowenthal, Ranking Member Gosar, and members of the Subcommittee.

I sit here today on behalf of the Western Organization of Resource Councils and their member group the Dakota Resource Council, both are grassroots-based organizations that work to have local voices heard and advocate for the responsible development of resources. It is a great honor to appear before you to discuss the tremendous damage that oilfield-produced water - also known as brine - has had and will continue to have on farmers and their land and water resources, unless far greater efforts are made to regulate and enforce proper well maintenance, as well as brine transportation and storage.

I am from Antler, North Dakota, where my wife Christine and I owned and operated our farm for more than forty years. We raised livestock and grew crops such as wheat, barley, flax, and soybeans. For the past several years, we have rented our land to my younger brother and his son-in-law. As farmers, the land is our life, as well as a precious asset to provide us with retirement income. It has been heartbreaking to see parts of our farm destroyed by a series of preventable brine spills.

I started farming on my own at eighteen years of age after my father passed away from a heart attack. A memory that stands out when I think of my father is a time I went with him to check on the farm of a family friend, and he saw that a trench had been cut into the well site dike to drain oilfield brine into a field and road ditch. He was drawn to tears. I did not understand why at the time, but have unfortunately learned firsthand through the years how brine can destroy all productivity of the land.

Over the past twenty-five years, there have been over a dozen significant brine spills on our farm at great damage to our crops. Each of these spills was equivalent to roughly two thousand gallons of released brine. At least five brine spills were not reported by the responsible oil companies. Regulators were made aware of all spills, but did not hold the companies accountable. Many of our friends and neighbors have also experienced large-scale brine spills on their property. The high cost of litigation and necessary time required are hurdles that most active farmers cannot overcome. They are left at a loss as to how they can get their land back into production, or hold the oil operators accountable. This journey for us has taken time from enjoying retirement, and resulted in what feels like a never-ending legal and political battle to protect and restore our land.

Brine is a toxic byproduct of crude oil, primarily consisting of sodium and chloride. These compounds can change the structure of the soil, so that the plants are unable to take up nutrients and water. In other words, the high salt content destroys the soil fertility. Brine can also contain small amounts of toxic chemicals, including radioactive components. Any accidental release can result in devastating damage to agricultural land and the contamination of water resources. Brine is transferred from producing wells by trucks or pipelines traversing farmland. I have seen many pipelines improperly constructed with inferior materials, and failsafes like overflow protection pipes not receiving regular maintenance, resulting in negligent spills.

A brine spill can be worse than an oil spill because unlike oil, brine consists of inorganic chemicals, metals, and salts that don't biodegrade. Brine spills make prime farmland useless for growing crops, and bring a negative value to the

land. Land that has been tainted by brine and not certified to be contamination free by thorough independent testing cannot be used to obtain a mortgage. Because brine spills tend to spread in the soil and water, a spill can affect a large amount of surrounding land. Lenders are reluctant to extend credit on neighboring land that has possible contamination. Christine and I have more than seven hundred acres of good farmland that lenders have refused to mortgage because of known and potential brine contamination. Each individual acre is valued at close to two thousand dollars, totaling well over a million dollars in lost land value, plus possibly millions more if we decide to remove the brine contamination and have the removal certified.

My personal experience with the oil and gas industry started just out of high school, when I worked for a local drilling company. Later on, during the 1980s and early 1990s, my brother and I worked as relief gauger pumpers on wells in our local community to supplement our farm incomes. A gauger pumper is a person who oversees and measures production of an oil well. So, I know and can appreciate the positive economic impact and employment opportunities that the oil industry provides to North Dakotans. These experiences taught me the importance of proper maintenance and oversight during oil and gas production, particularly since it's not uncommon for oil wells in our area of North Dakota to produce roughly 100 barrels of brine per each barrel of oil. My brother and I were hired to service three wells that were leased on our own land, along with approximately twenty others in the area. The wells we monitored produced large volumes of brine, so we checked them twice a day. Our worst fear was always that brine could be spilling onto the land.

When some the well sites we took care of on our own land were sold to a different oil company in 1990, they chose to use their own employees to pump and gauge the wells. Within one week, a brine tank ran over and a large amount of salty brine ran into a wetland located 200 feet from the well site. I complained to the responsible oil company and regulators, but very little was done to clean-up the spill. Over the next twenty years, spills continued. In 2010, I finally convinced regulators to formally conclude that large-scale brine contamination was present on my farm after undertaking administrative action. In 2012, an attempt was made by one oil company to dig out contaminated soil and replace it with fresh soil. After spending an estimated $2 million, the reclamation company declared that the clean-up was satisfactory, and got regulators to sign off. However, to this day, that land is still barren and unable to support crops, despite attempts to reseed it. In 2018, after more spills and costly litigation and testing, we reached a private settlement with one oil company for long-term remediation of their lease site. I am grateful that the current operator has agreed to evaluate and restore our land, which is an ongoing process.

At a personal cost of hundreds of thousands of dollars, I hired an outside consultant to conduct independent testing on a portion of my land. This testing showed that a large amount of brine remained in the soil as deep down as fifteen feet, and had contaminated my water stock wells beyond use. The contaminated water is being pumped out of my wells, but the removed freshwater is now forever out of the water cycle. It will take further testing and evaluation to determine how many total acres are contaminated. The only proven method of brine remediation in North Dakota is digging out contaminated soil and replacing it with healthy soil. It is not uncommon for effective remediation costs to exceed one million dollars per acre, and can cost up to several million dollars per acre. There are efforts to find new

methods to remediate damage from brine spills. All of these will be very costly, and there is no way of knowing if they will be effective. Other methods such as using soil amendments like gypsum and drain tiles to flush the salt have had limited success. Some commercial soil amendments that are said to show some promise in other warmer climates have not been very effective in North Dakota.

I consider myself to be a supporter of responsible oil and gas production in North Dakota and across the country, and acknowledge the great benefits that oil and gas royalties and employment can bring. But responsible development means protecting the land from the destructive impacts of brine spills that come during transportation through pipelines or on trucks and during filling and emptying of storage tanks. Accidental spills can occur, but there should be no tolerance for preventable spills or negligence. The most important role for regulators is to carry out regular inspections and enforce the standards on the books. In my experience, regulators have been reluctant to enforce compliance. They wear two hats - regulators *and* promoters - and have minimized the impacts, rather than holding the oil companies accountable.

When oil wells and oil fields age and lose economic productivity, or are affected by low crude oil prices, they are no longer profitable. Because of this, companies often do not put as much time and money into maintaining old wells, resulting in a greater occurrence of brine spills. Our land, water, and livelihoods should not suffer because of the economics of oil production. New technology using cameras and sensors are being utilized at some oil wells, but with huge volumes of brine, large spills can occur before the cause of the spill is determined and repaired. Older, less profitable oil fields do not have the latest spill prevention

equipment, and often do not receive proper maintenance, causing frequent and damaging brine spills.

I have a few recommendations for the committee. First, I want to again stress the importance of adequate well inspections and enforcement. Both the Bureau of Land Management (BLM) and the state need to be accountable to carry out this part of their mandate, and they need to be given the resources to do it. Second, companies should be required to submit a water management plan with their permit applications, and to replace impacted water supplies contaminated by drilling operations. Baseline water testing should be required before drilling begins. Third, I would like to suggest the establishment of a reclamation fee and related fund to ensure that damaged lands are restored when the responsible company is unable to pay, so the landowner and taxpayers are not forced to bear the cost. Finally, stronger standards are needed for wastewater systems to prevent brine leaks and spills.

I hope my testimony will help the subcommittee begin to understand the devastating impacts that brine spills have on our farmland and our water, and therefore the importance of strong federal laws and regulations that will help reduce the likelihood of spills and hold industry accountable for its actions. The BLM has a large role to play in the creation of these strong regulations and enforcement. While the majority of North Dakota surface and mineral rights are privately owned, there are 4.5 million acres of federally-owned split estate minerals[1], and 91% of all Bakken spacing units include some federal mineral

[1] BLM Public Lands Statistics Report 2017, https://www.blm.gov/sites/blm.gov/files/PublicLandStatistics2017.pdf

ownership or trust responsibility[2]. Both BLM and state regulators must put more emphasis on the damage brine spills have on our rural economy and environment, and put rules in place to protect farmers.

Thank you for the opportunity to testify. It would be an honor to give any interested subcommittee members a tour of brine damaged lands in North Dakota, and illustrate firsthand the need for good stewardship and strong federal protections to safeguard our beautiful state.

[2] https://www.google.com/url?q=https://republicans-naturalresources.house.gov/uploadedfiles/helmstestimony05-08-13.pdf&sa=D&ust=1557846599111000&usg=AFQjCNHN51GrDL74ka5Q29KJP5YzfuqUxA