2017 HOUSE ENERGY AND NATURAL RESOURCES

HB 1151

2017 HOUSE STANDING COMMITTEE MINUTES

Energy and Natural Resources Committee
Coteau –A Room, State Capitol

HB 1151
1/12/2017
26858

☐ Subcommittee
☐ Conference Committee

Committee Clerk Signature Kathleen Davis

Explanation or reason for introduction of bill/resolution:

Relating to the reporting of well pad or oil and gas production facility fluid spills

Minutes: Attachment #1-#10 and Digital Attachment HENR010517

Chairman Porter: Called the committee back to order on HB 1151.

Rep. Streyle, introduced HB 1151. See Attachment #1 relating to required reporting of spills (fresh water, brine, oil, gas and other fluids) in the oil and gas industry adding a new section to NDCC 38-08-04.

12:45

Ron Ness, president of the ND Petroleum Council, appeared in support of HB 1151. See Attachment #2-#3. If passed, HB 1151 would bring ND in line with what other states and the federal government require.

23:16

Rep. Mock: The language in HB 1151 would apply to all existing pads?

Ron Ness: Correct if it is a pad that's defined in here.

Rep. Mock: I appreciate the graphic on the new Bakken pad and you describe some of the safety features. Can you describe the engineering and safety features an old Bakken pad or other pads that exist across ND?

Ron Ness: There's a difference. (a) because of the volumes of fluid you're managing on these Bakken wells versus traditional wells. The pads themselves are generally bigger and you can still go down to the clay. There's rules in ND come from the 90s come from the construction/compaction of that pad. They're not as large but are not carrying the volumes of water or oil. The old pads under new industrial commission rules, if they don't have a berm, the fields staff will be out evaluating them to determine if there's a slope towards a waterway, they're going to require berms on them. Yes, I think there's a difference. I don't have how

many spills occur on old pads versus new pads but just like in every role, we don't necessary have non Bakken rules and Bakken rules, the majority of the pads today are Bakken type facilities. Going forward we certainly anticipate that. That's valid issue, there is a difference. On a volume basis, the volumes of barrels and liquids moving through Bakken wells versus the deminimus amount of non Bakken production we have today is pretty significant.

Rep. Mock: After this is there a summary of safety features for older pads in ND. It's great knowing what the new ones look like and how they're designed. If you have information to compare safety and design, the older ones to the current ones would be helpful for the committee. Follow up question. If you have an older pad that's refracted, if were reworking an existing pad that is older and has different safety features, is there a requirement for the pad to be enhanced and enrich its safety features, or is it grandfathered in?

Ron Ness: When we talk about work over rigs, refract is a Bakken term. Going back into Red River wells, or other wells, the pads and design of those pads are much smaller so much likely you're going to get off pad of course. If you have a spill of significance or heater treater (?) that has a malfunction and you spray oil, I don't think you rework your pad. You have your standards for your pad. I think it's all a function of the evolution of the size of pads now. Initially you were making pads in the Bakken one well pads. Now the pads are going in designing and it's more of a manufacturing process. They know exactly what they have to do.

Rep. Mock: If there is a spill reported of barrel or less, what's the typical response vs over 10 barrels?

Chairman Porter: Mr. Helms can answer that. On site, it's the Industrial Commission's responsibility not the Health Department.

28:37

Rep. Keiser: I'd like to get on the record what is a 10 barrel plus event? What if you have a leak in a pipe, it's under 0° temp. So night 1 you have a leak of 8 barrels, clean it up, etc, the next day 2, it goes below 0° and you have a second leak of 5 barrels. Now you're either at 8 and 5 or 13. How does this law approach cumulative leakage on a pad.

Ron Ness: The answer to that is if the company had a second leak they did a pretty poor job if it happens the second day. Generally speaking, if you have that happen you take care of that. That's what I see as the major and minor program under the Federal system. Yes, this is a significant issue, let's get out here and make an assumption at some point. People who deal with every day have a better understanding if it's 5 or 85 barrels. You always have that discretionary thing that needs to be followed up on in major type issues that are a more significant event.

30:47

Rep. Keiser: For the record, would you agree a 10-barrel single event has to occur, and cumulatively each event is under 10 and it doesn't become 13 or 16 a month later.

Ron Ness: I think it does not dictate to us. We would consider a spill and event. That would be something clarification if necessary. It does not specify. A spill is a spill. I spilled ½ cup yesterday, ½ cup next week, it's 2 – ½ cups.

Chairman Porter: On the old well sites, and the new Bakken sites, inside of the proposed amendment, it says in there they have to been brought up to current specs by saying they have secondary containment and it doesn't leave the site. Those sites that don't have secondary containment in place, where it would still be under the old zero basis, wouldn't they?

Ron Ness: The amendment clarifies the types of facilities. It says the facility or sight has secondary containment. So it heightens the level of containment you have to have on your pad.

Chairman Porter: If it's a legacy type site, that doesn't have a secondary containment system, there threshold will be at 0. If it's a new site that has a secondary containment system and has a new modern site, there's would be at 10.

Ron Ness: You might ask from the industrial commission about making the 1990s rule which really ups the level of design and compaction and requirements on the pads and look at how many pads pre1990s are out there versus new pads.

34:03

Kathleen Spilman: registered professional engineer in ND with a BS degree in chemical engineering from UND, and works for Keitu Engineering and Consultants. See Attachment #4. She spoke in favor and asked for a Do Pass on HB 1051.

45:10

Troy Kunz, chairman of NW Landowners Association, representing 500 farmer and rancher property owners in ND, and spoke in support HB 1151 with exception of trigger point of the reporting. We feel if the trigger point is at 10, it leads to the chance of more human error. Many of the reports in the EERC study show a lot of items of concern are human error. Example, here is 7 barrels' spill, is it 14 barrels, is it 300 gallons, is it 750 gallons. It puts a lot of that back on that individual judging it that day so there could be a lot of human error. With this number of spills, being a property owner, we have a surface use agreement, but we still own the property. We feel that we would like to know what type of releases have happened, long term cumulative effects could be devastating. We would like to informed and notified. I hear the word assumption a lot. Most things in life we say assume away. Assumptions here are not the best practices.

Chairman Porter: did you have written testimony? trigger point?

Troy Kunz: No.
That and a proposed change on the trigger point. We like the trigger point the way it's set now at 1 barrel.

Chairman Porter: So you're really opposed to the bill?

Troy Kunz: No. We're in favor because right now it's just in rule. Wherein practice, this would make it law. Changing the trigger point.

Chairman Porter: Testimony in support? Opposition?

49:30

Paul Sorum: architect and employed in the oil industry working for a number of environmental companies. Attachment #5. Without a clear definition of a production-related facility, any tank farm, transfer station, pipeline riser, treatment facility, or pipeline might arguably be included within this vaguely defined jurisdiction. He highlighted (1) jurisdiction is not limited, (2) hazards of spills are not limited to crude oil, (3) 10 barrels in not a small number, and (4) HB 1151 presents due process problems such as (a) measurement, (b) no incentive to report volume versus number of spills, (c) dilution, (d) unseen spills, (e) corroded equipment, (f) cold weather. His testimony felt HB 1151 was politically unwise and may rish public safety and that this will would NOT achieve these goals but serves to put both the environment and the oil and gas industry at risk for no reason or benefit to the people of ND.

59:44

Rep. Roers Jones: Clarify if we were to adopt Rep Streyle proposed language, however if the leak or spill occurs in a secondary containment area and doesn't leave the site and is less than 10 barrels, then no report is required. So if that language is adopted, are you suggesting you would not be opposed to NOT needing to report a spill in a containment area?

Paul Sorum: If it's in a containment area then it's never going to touch any of the natural environment. In my opinion where you spill fluid into a containment area and it's truly contained, technically that's not a spill and it calls into question why do we codify this. If you're going to do this bill, define exactly what a spill is and define exactly what that containment area is. There are standards out there and you can refer to those and include them in what this containment area is. That needs to be done or all of a sudden there are these other conditions you haven't foreseen that might be lumped in production related handling facility.

1:01:34

Kevin Herman: spoke in opposition to HB 1151. Specifically, Page 5, Lines 15-19 talking about the release of fluid containing 10 or fewer barrels of fluid. The proposed amendment, I don't agree to that. The reason I am a property owner. I'm on the edge. I live in Mercer County (no drilling there yet in Mercer). My concern is as a property owner I would want to know even if it's less than one barrel. If the well pad is no longer in use and they take everything away, how if there's a spill, how am I supposed to know, that if it's pasture or cropland, it doesn't produce, and I'm wondering what's going on here. It was where the well pad was, but I can't get the pasture or cropland back in service. Now FYI I do lease. The person I lease to, can't produce, he's losing money too. That is my concern.

1:04

Fintan Dooley: Attachment #6-#7 He spoke in opposition and stated, "Adopting this law would indeed accelerate the damaging and destruction of farm and ranch lands that is already occurring in the unconventional Bakken development. We have not even begun to reclaim damage done by the oil industry. The spills are accelerating and not recorded. To pass this bill will encourage no reporting."

1:08:25

Kayla Polvamacher: resenting ND Farmers Union agreed with Mr. Kunz testimony. She wanted to stress that producers want to know if there are spills on their land and should be notification.

Derrick Braaten: attorney with Baumstark, Braaten Law Partners, Bismarck. He agreed with the point from Ms. Polvamacher. We represent farmers and ranchers and represent them in the oil field as well. When a company is going in to do reclamation it's very helpful for us if we end up in litigation. Our experts need information what spills have occurred on a well site, even with clay at some point you have salt water and spills leaching down into the soil and potentially leaching out. As an attorney who represents landowners, regardless of what this bill is doing now, would very helpful for the landowners to have at least notice there's a spill on their property so they can document it.

1:10

Rep. Heinert: Can you put language in the contract (inaudible – no mic on)

Derrick Braaten: You could. It really depends on the company and the situation. A company may have an implied easement, there's no requirement for them to even negotiate a surface agreement with you. They have a requirement to give you notice and pay compensation. Sometimes I may be able to negotiate that in a contract. Sometimes I get a contract from a company and they say they we don't make changes. So my answer is yes and no.

Rep. Keiser: The question is what is an appropriate reporting level and what degree should it be reported.

Derrick Braaten: I don't have a magic number.

Rep. Keiser: This magic number is 10 barrels
Derrick Braaten: I'm comfortable with the 1-barrel limit we have not but to the extent this bill is attempting to deal with inefficiencies and additional work for the agencies- I'm not initially commenting on that because I don't know what work the agencies are required to do as a result of spill report. If that's the problem I think that can be dealt with by saying if it's under 10 barrels they don't need to or up to their discretion how they respond. My concern, is yes, if I had to pick the existing number of one (1) barrel so the landowner is aware. Specifically, because not all of these spills are cleaned up 100% and when that seeps in, you still have some remnants, additional rain, water, continue leaching into the soil. That's not

necessarily an immediate threat but down the road when that company comes back in to reclaim that site the landowner, it's going to be very important if over 30 years they can say there were 7 spills totaling 40 barrels over the time that site was there and will be helpful information for their experts when looking into reclamation.

Rep. Keiser: Is it acceptable they have to report it but doesn't have to be an investigation?

Derrick Braaten: I'm speaking for myself, but as someone who represents landowners, as long as the landowner has that option to bring that concern to the Industrial Commission.

Chairman Porter: follow up to Rep. Keiser, your concern is with the landowners' side of things. Landowners aren't notified and would have to go out to the state site and find the log that pertained to their property.

Derrick Braaten: Correct

1:14:36

Karen Erickstad: Attachment #8 spoke in opposition to HB 1151. She stated it seems the purpose of this bill is to ease the burden of spill reporting off the shoulders of oil companies. This would be a positive for employees, and management within those companies but at two major costs: (1) this bill would cost data that is valuable if actually used by the regulators with jurisdiction over oilfield spills, and (2) transparency- the public deserves to know what operators are being good stewards of the land. After repeated spills, even small ones, there is no such thing as containment to the well pad – it's impacting the land – which ultimately affects our agriculture economy and potentially public health.

1:19:39

Nichole Donaghy, field organizer for Dakota Resource Council to oppose HB 1151 representing members, and in particular she read a statement from member, Shelly Ventsch of New Town, ND in opposition. Attachment #9 , stating all spills should be reported.

1:22:40

Chairman Porter: asked Mr. Helms to come forward and speak to the definition of a spill is and what is inside of the berm and the current reporting requirements, and how the system current works, and how you view how the system under the proposed HB 1151 would work.
Lynn Helms: director of the Dept. of Mineral Resources, ND Industrial Commission, presented Digital Attachment HENR010517.
What's really important is that the existing language doesn't limit itself to spills, leaks and releases of fluids. If a leak doesn't soak into the ground a spill, this would still require them to be reported. A leak out of primary containment has to be report whether you call it a spill or not. Commonly understood terms: leaks and releases of fluids. The way it works today jurisdictional a spill, leak or release of fluid on a pad or facility is under the jurisdiction of the Industrial Commission, off the pad Health Dept. A release on the pad really is also under the jurisdiction of the Health Dept. The real distinction is the Health Dept. has jurisdiction over the clean air act and safe water drinking act. Because it fits that but doesn't fit it perfectly

the Health Dept. jurisdiction begins and ends with air and water impacts. Clearly a release that gets off of a pad or facility, endangers the waters of the state, surface water, ground water and has air impacts. That's an easy distinction to draw. It's led to a reasonable way of responding so we're not having every state employee respond to every single release. Today, if it is in excess of 1 barrel or 42 gallons of fluid, there's an immediate verbal reporting requirement to the department. Call Dept of Emergency Services, Health Dept, the Oil and Gas Division or field inspector. Within 24 hours go online and fill out a web form in more detail. Depending on environmental or safety threat, we'll triage the spill. If very small, inspected next time inspector visits the location, usually one time a month. If of significant size, 10-barrel rule of thumb, the inspector will get by within a day or two. If very significant, 100 barrels and getting off site, they will drop what they're doing and go there. Legally everything is based around that 1 barrel (42 gal) volume. If we make this change, what happens. Roughly of the 922 number does not Ft Berthold Indian reservation (because they've been informed by the EPA they have no jurisdiction there). We include spills from there in our statistics. 69% of what's reported today, would not be reported statewide. The number of reports would drop to approximately 1/3 of what it is today. Under this scenario an inspection would have to be on every one.

1:32:03

Chairman Porter: On to the reclamation side, is the soil sample and other tests required on any site where this is they passed or not, are those passed on to the operator? Are they part of the original permit fee, or how do they recoup those types of costs?

Lynn Helms: We typically require the operator to pay for all of that. My field inspectors and reclamation inspectors own electro conductivity meters and sometimes take samples, and maybe don't want someone to know we took a sample. In the instance where we would do a site survey or require soil samples or EC measurements, that would be the responsibility of the operator to pay for. They wouldn't pay for the field inspector coming to that site and doing the onsite and saying we're testing multiple places.

Our best conventional well site pads are around 2200. 2000-2500 well pads and facility sites still operating that don't meet the standards of what you're looking at over there today. They've been upgraded significantly since 1990. Since then they've done spill prevention and countermeasure plans under EPA requirements. They are subject to the new berm rule. We've required secondary containment or diking. If they store over 31.4 barrels (1320 gallons) then they have to have that diking. There's approximately 8000 new pads, Bakken era pads build 2006-most recent 2015. We anticipate another 7000 subjected to rigorous requirements. That leaves us with 2200-2500 that we would be concern about which have had some upgrading.

1:36:29

Chairman Porter: The way the proposed amendment reads that it says, "or the site has a secondary containment" that's one of the ways it goes from a zero reporting to a 10-barrel reporting. Those legacy sites, if they do not have that secondary containment system, they remain at zero?

Lynn Helms: They would fall under 0 or 1. I don't know if the Industrial Commission would change the 1 to zero, they'd remain at the current level.

Chairman Porter: They would not move to the new level. If they wanted to move to that new level, they would have to do enhancements to their site.

Lynn Helms: Correct. They'd have to construct impermeable secondary containment to move to the higher level.

Chairman Porter: With the words in the 1st line in the proposed amendment. The second it would be traveling off the site or outside the site then none of this applies to that.

Lynn Helms: That's correct. The pipeline itself would be considered off site and have zero reporting threshold. The reason pipeline is in here is talking about a person control or operating a pipeline, they frequently have some surface facilities, compressor station on their gather system, or a tank or pig receiver or launcher, and those would be considered facilities or sites and those have a different requirement. As soon as the pipe goes underground and left the boundaries of that facility, it would go to zero threshold.

Rep. Mitskog: Where we would be in comparison to other oil producing states TX OK etc.

Lynn Helms: I have some, I can get you info on every state if you like. We are a member of Interstate Oil and Gas Commission. All 30 oil and gas producing states are members as well as 6 associate members. For Federal government, its 10 on site, 10 off site; for TX it's 5 on site 5 off; OK it's 10 on site and 10 off site. CA is 5 barrels, Called the committee to order on 25 barrels, NM 5 barrels, and AK less than 10 gallons, submit on your monthly report. If more than 10 gallons, you've got 48 hours to report it and more than 55 gallons, call someone. That's North Slope. ND next in line behind AK.

Rep. Mitskog: How long have requirements been in place?

Lynn Helms: Since 1992. A cow rubbed a valve open and oil got out and got to the river and so requirements were adjusted in response.

1:41:42

Rep. Anderson: Are there some type of standards for the storage tanks on well pad sites? How do you go about whether their fit to use or replaced?
Lynn Helms: We don't have any standards. If equipment is unused or unusable it has to be removed. We follow the API standards.

Rep. Anderson: So when you go out and inspect a pad site is that part of your regular inspection? Do you look at the tanks too?

Lynn Helms: Absolutely. I did some demographics. 33% of my employees (field inspectors) got less than 3 years' experience. So we had the 13% who have over 30 years, sit down this fall and write guidelines to conduct a proper site inspection. They now have an extensive

guidance document and one of the things is to get inside the secondary containment, walk around the tanks and looks for spills and leaks on the pad.

Rep. Bosch: Go back to the secondary containment. So that's 3 sided, bottom and 2 sides, no dome over the top. If gas enters the atmosphere at any level, that's not contained?

Lynn Helms: That's correct. Primary contain is the vessel itself, the fiberglass or steel tank. Secondary containment under our rules and EPA rules, is an impermeable barrier under the facility and an impermeable dike or berm around the equipment that is capable of containing the volume of the largest tank plus 24 hours of fluid. That could be a clay berm, steel berm with synthetic liner under it, but impermeable. We now have implemented a new controversial rule in many instances because a significant percentage of spills are not contained to the site. Our field inspectors are auditing all sites, a minimum 6" tall berm has to be built around the entire outside edge of that site so that we can even improve on the containment. A lot of times a truck driver will pull up outside a secondary containment, fill his truck, and maybe over fill, or the hose breaks, so the fluid is released outside the secondary containment but we need to keep it on the pad or facility. That's the purpose of the berm rule.

Rep. Ruby: One big concern from landowners is possible long term effects on the land. What procedures go into cleaning up a spill.

Lynn Helms: If properly cleaned up there's no long term effects. We need to find them, and fined, and properly cleaned up. One effort we're participating in, is to help the Health Dept. in coming up with cleaning up cleanup standards. The Health Dept. jurisdiction is over air and water. So there's a standard you need to reach, that water can't mobilize it or move it. So the ground water and surface is protected. We also have a cleanup standard, the maximum amount of contamination so you have to excavate until you reach that contamination level. Ultimately the law and rule in ND requires the site be returned to as close as practicable.

Vice Chairman Damschen: Is it possible if we had a specific definition of a spill for this section, an uncontrolled release of toxic liquid?

Lynn Helms: That may be helpful. I'd be happy to work with the committee on that. When we talk about a leak, spill, or release of fluid, that this statute applies to a leak, spill or release of crude oil or produced water. Some chemicals used are more toxic. Maybe we want to be stricter with those.

1:51:14

Rep. Heinert: (inaudible – no microphone on) change that last line .... report to the commission required? If we change that language to say, then a report to the commission is required, (inaudible) but no investigation is required?

Lynn Helms: A requirement instead of prohibition would be useful. I haven't thought about that.

Chairman Porter: There was implications made about the integrity of the reports current getting and amounts being reported and the fudge factor comes into play if we change this from one barrel, even though the fudge factor is currently in play, if it's 2 barrels and they report it as less than one or don't report it. You're out there and working in the industry, give us the prospective of the regulator and the integrity of the industry in reporting.

Lynn Helms: Great question. That will always be an issue. That will happen. Operators that are not on our naughty list are very good and proactive about reporting. There will be operators who will have to be taken to civil courts and criminal courts because they'll spill 18 barrels and say it was two 9 barrel spills at the same time. That's why you do an inspection enforcement and we go to these sites every month. We look for that sort of behavior. This does not change the requirement to clean it up.

Karl Rockeman: director of the Division of Water Quality with the ND Dept. of Health's Environmental Health Section. ATTACHMENT #10 and did not pick a side, just wanted to provide some clarifying comments.

1:57:50
Greg Wills: Deputy Director of (inaudible) also serve as Homeland Security director for the State of ND. I chair the cerk (inaudible)1:57:47. We are the repository of every spill that occurs in the state of ND. We track them all as required by law. Whether they come from a 911 call, industry, health, oil and gas. It's an administrative burden but there are some chemicals on these pads that we would have the same concerns as heard from Mr. Helms. Define fluid in the bill and limit fluids to the production, water and crude oil at 10 gallons. The inspection and reclamation processes are there; they're going to do their best. We all want to be stewards of the land. Literally 10 barrels on a pad at the level of standards today, not an issue in our personal opinion and it's a burden to track. We will continue to do that should the law not come into effect. Sulfuric acid is one we should not allow 10 barrels to spill. If we would just define fluid.

Rep. Mitskog: If fluid was defined as oil and salt water, how do we have assurance that bad chemicals would be disclosed?

Greg Wills: You rely on the honesty and trustworthiness of the industry to report.
A spill is a spill to us. In terms of chemicals, benzene content, etc, at the end of the day it's a barrel of crude oil and that's what we're concerned with. Some of these things can fume, and they can fume off. We'd want to know about that.

Chairman Porter: Closed the hearing on HB 1151. Thank you

2017 HOUSE STANDING COMMITTEE MINUTES

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Coteau –A Room, State Capitol

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☐ Subcommittee
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Committee Clerk Signature	Kathleen Davis

Explanation or reason for introduction of bill/resolution:

relating to the reporting of well pad or oil and gas production facility fluid spills

Minutes:

Amendment

Chairman Porter: Called the committee to order on HB 1151. After the hearing I worked with various groups that were both in favor and opposed to this bill and I also had Mr. Helms from North Dakota Oil and Gas go to work on it to see what we would come up with as far as language that would make sure that number one we are dealing with the sites that have and impermeable floor and a dike system so that the 2,000 in the Renville Bottineau area that don't have that, if they want to get in underneath this reporting requirement they would have to enhance their sites. The other issue that came up was the other chemicals that we were concerned with that weren't specifically oil, crude oil produce water natural gas liquids. In this amendment that does not change. They are still anything less than a barrel they are a non-reportable event. Anything more than a barrel they are a reportable even with this amendment.

Lynn Helms Director of Department of Natural Resources: I think representative Porter gave you a very good over view with what we did or attempted to do with this amendment. There was concern that old legacy sites that didn't have the modern impermeable floor, secondary containment or perimeter berm might be included. This amendment takes care of that and if you want to get the exemption the site has to meet those standards. It could be a clay impermeable floor; it could be secondary containment around the site or it could be some other perimeter berm. It could be some other containment system bit it's going to have to have both of those in order to qualify to have the change in reportable quantities but its limited just to crude oil, water and natural gas liquid. So all those other chemicals they stay at one barrel on site and any amount off site. It does not affect off site at all, it does not affect spill cleanup. We have made it clear in statute that when one of our field inspectors issues a written notice of violation saying you have a spill that's over the limit and you didn't report it or issues a violation saying you have gone without cleaning up the spill that would go in the well file and the owners would have access to that information.

Chairman Porter: representative Keiser had brought up the cumulative amount of 10 barrels over a 15-day time period so you can't have 4- 9 barrels spills and then say that you haven't had a spill. That was the other component of that.

Lynn Helms: That is an important change. There has been some discussion with in our department of how are we going to want that reported, the details about spill reports. That all needs to be worked out under the Governors initiative to streamline spill reporting. That kind of detail doesn't need to be built in to statutory.

Chairman Porter: from the standpoint of the landowner if we make this adjustment you talked about all sites would have a Phase 2 component completed, then the reclamation of the site.

Lynn Helms: It is my understanding you might see that move into the Century Code. The sight be restored as close to practicable to an original condition. There will be a survey of that sight using at minimum and electrical conductivity meter to look for events that didn't get reported or detected. The law states that it need to be as close to possible the original condition and this statute will not change what happens at the end of life on a facility or site.

Rep. Seibel: If I'm reading this correctly the only way the surface owner is notified is if he researches this himself?

Lynn Helms: It would be their responsibility to access the file. They are public record they can check it from the website.

Rep. Marschall: how long are these reports available?

Lynn Helms: These particular files are required to be kept forever. Our policy is anything less than 6 years old the paper copy is kept at our office, 6-12 years old is at our warehouse, and 13 years in perpetuity electronic copy is made.

Rep. Anderson: Let's say I was renting land from the service own and he called to see if it was possible for me to go look at the site where the spill occurred. Is there a process where you can do that?

Lynn Helms: We do take people on sites. we do not take visitors unannounced. The surface owner can clearly go there anytime he wants and the tenant would have to arrange it with the surface owner or arrange it will one of our field operators.

Rep. Anderson: If they do put a berm around them and they're in the bottom of a water way, is it any different common sense says you would probably want a high berm.

Lynn Helms: The 6" berm is a minimum requirement. In circumstances like that our rule says you have to construct a berm or containment that not only will contain onsite fluids but will divert run off to run off the site.

Rep. Keiser: One risk we run when we get so specific, it does say any leak or spill and then has an exception. It covers so many areas of production obviously you have lubricants and

other thing that you put on a motor but they are going to leak some oil is going to drop on that ground and that is any spill. How does that get handled?

Lynn Helms: It is always a danger to get too specific. We wrote this purposely to leave some flexibility. If it's on that pad it would have to exceed 1 barrel or 42 gallons.

Rep. Mitskog: Help me with the definition of a paying quantities in the abandon well?

Lynn Helms: What they are talking about there is abandoned wells and what triggers a well goes into abandoned status. The definition is an amount that exceeds the operating costs of the well.

Chairman Porter: further questions? Any more comments or concerns? And because we have this amendment in front of us that rewrites the bill if anyone else would have a comment or concern to the amendment prior to us going further with the amendment they could come forward right now. Seeing none we have a proposed amendment in front of us.

Rep. Kieser: Motion to move forward amendment 04001

Rep Bosch: Second

Voice vote. Motion carries.

Rep M. Ruby: Motion Do pass as amended.

Rep Heinert: Second

Roll Call Vote Do Pass as amended on HB 1151

Total yes 11, no 2, 1 absent.

Motion passes floor carrier Rep. D. Anderson.

Chairman Porter: closed the hearing.

1/19/17 DA

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Title.05000

Prepared by the Legislative Council staff for
Representative Porter
January 19, 2017

PROPOSED AMENDMENTS TO HOUSE BILL NO. 1151

Page 5, line 15, remove "The commission may not require any person controlling or operating any well, or a"

Page 5, remove lines 16 through 18

Page 5, line 19, replace "fewer barrels of fluid" with "A person controlling or operating a well, pipeline, receiving tank, storage tank, treating plant, or other receptacle or production facility associated with oil and gas, or with water production, injection, processing, or well servicing, shall report to the commission any leak, spill, or release of fluid. A report to the commission is not required if the leak, spill, or release is crude oil, produced water, or natural gas liquids in a quantity of less than ten barrels cumulative over a fifteen-day time period and remains on the facility or site and the facility or site has impermeable base material and containment.

3. Any written violation notice issued by the commission regarding the notification of a fire, leak, spill, blowout, or leak and spill cleanup must be placed in the well file or facility file and the files must be available for review by the surface owner"

Renumber accordingly

Date: 1-19-17

Roll Call Vote #: 1

2017 HOUSE STANDING COMMITTEE
ROLL CALL VOTES
BILL/RESOLUTION NO. 1151

House Energy & Natural Resources **Committee**

☐ **Subcommittee**

Amendment LC# or Description: 17.0060.04001

Recommendation

☒ Adopt Amendment 04001
☐ Do Pass ☐ Do Not Pass ☐ Without Committee Recommendation
☐ As Amended ☐ Rerefer to Appropriations
☐ Place on Consent Calendar

Other Actions ☐ Reconsider ☐ _____

Motion Made By Rep. Keiser **Seconded By** Rep. Bosch

Representatives	Yes	No	Representatives	Yes	No
Chairman Porter			Rep. Lefor		
Vice Chairman Damschen			Rep. Marschall		
Rep. Anderson			Rep. Roers Jones		
Rep. Bosch			Rep. Ruby		
Rep. Devlin			Rep. Seibel		
Rep. Heinert					
Rep. Keiser			Rep. Mitskog		
			Rep. Mock		

Total (Yes) Voice vote carried No _____

Absent _____

Floor Assignment _____

If the vote is on an amendment, briefly indicate intent:

Date: 1-19-17

Roll Call Vote #: 2

2017 HOUSE STANDING COMMITTEE
ROLL CALL VOTES
BILL/RESOLUTION NO. 1151

House Energy & Natural Resources Committee

☐ Subcommittee

Amendment LC# or Description:

Recommendation
☐ Adopt Amendment
☒ Do Pass ☐ Do Not Pass ☐ Without Committee Recommendation
☒ As Amended ☐ Rerefer to Appropriations
☐ Place on Consent Calendar

Other Actions ☐ Reconsider ☐

Motion Made By Rep Ruby Seconded By Rep Heinert

Representatives	Yes	No	Representatives	Yes	No
Chairman Porter	✓		Rep. Lefor	✓	
Vice Chairman Damschen	✓		Rep. Marschall	✓	
Rep. Anderson	✓		Rep. Roers Jones	✓	
Rep. Bosch	✓		Rep. Ruby	✓	
Rep. Devlin		✓	Rep. Seibel		✓
Rep. Heinert	✓				
Rep. Keiser	✓		Rep. Mitskog	✓	
			Rep. Mock	A	A

Total (Yes) 11 No 2

Absent 1

Floor Assignment Rep. Anderson

If the vote is on an amendment, briefly indicate intent:

REPORT OF STANDING COMMITTEE

HB 1151: Energy and Natural Resources Committee (Rep. Porter, Chairman) recommends **AMENDMENTS AS FOLLOWS** and when so amended, recommends **DO PASS** (11 YEAS, 2 NAYS, 1 ABSENT AND NOT VOTING). HB 1151 was placed on the Sixth order on the calendar.

Page 5, line 15, remove "The commission may not require any person controlling or operating any well, or a"

Page 5, remove lines 16 through 18

Page 5, line 19, replace "fewer barrels of fluid" with "A person controlling or operating a well, pipeline, receiving tank, storage tank, treating plant, or other receptacle or production facility associated with oil and gas, or with water production, injection, processing, or well servicing, shall report to the commission any leak, spill, or release of fluid. A report to the commission is not required if the leak, spill, or release is crude oil, produced water, or natural gas liquids in a quantity of less than ten barrels cumulative over a fifteen-day time period and remains on the facility or site and the facility or site has impermeable base material and containment.

3. Any written violation notice issued by the commission regarding the notification of a fire, leak, spill, blowout, or leak and spill cleanup must be placed in the well file or facility file and the files must be available for review by the surface owner"

Renumber accordingly

2017 SENATE ENERGY AND NATURAL RESOURCES

HB 1151

2017 SENATE STANDING COMMITTEE MINUTES

Energy and Natural Resources Committee
Fort Lincoln Room, State Capitol

HB 1151
3/9/2017
Job # 28987

☐ Subcommittee
☐ Conference Committee

Committee Clerk Signature Pam Dever

Explanation or reason for introduction of bill/resolution: Relating to the reporting of well pad or oil gas production facility fluid spills.

Minutes: Attch#1,#2,#3=RepStreyle;Attch#4=RepAnderson;Attch#5=RonNess; Attch#6=KathleenSpilman;Attch#7,#8=WaydeSchafer; Attch#9=Kevin Herrmann;Attch#10=Patty Jensen;

Chairwoman Unruh: Open the hearing on HB 1151.

Rep. Streyle, Dist.3, Minot, ND: (.40-7.37) The original bill was heavily amended. Much better bill than introduced. **(see Attch#1)** Look at your chart **(see Attch#2**) you can see that feds require 10 barrels or more on or off pad. We are the most restrictive in the nation outside of Alaska. They have a zero tolerance policy like ND. This bill only applies to on pad oil facilities. If passed, ND would still be more restrictive than the federal government. Spills on pad have no impact. This does not change anything with cleanup. You have to clean up. If it touches water, then the EPA gets involved. Look at the barrel's chart. **(see Attch#3**) More than half the time we had only small spills and had no environmental impact. The House added that in order not a bill relating to report a 6-barrel spill, you need to have an impermeable base and continuing. If you do not have that in your site, you have to report. The House added a 15-day period and had three spills of 4 barrels apiece, which is added and over 10, that would have to be reported. That was a good change. Any questions?
Sen. Schaible: You mentioned that this does not change the cleanup requirement.
Rep. Streyle: Correct. That is not changed.

Rep. Dick Anderson: I am here to introduce an amendment. **(see Attch#4).** We found more wells that had containment but they did not stop the leaching. So we added about 500 more wells that this would not apply to. The new well sites have the clay barrier, which is great. (9.18)
Chairwoman Unruh: Was this discussed in the House ENR committee?
Rep. Anderson: No, it was not. At that time, we did not know that there were an additional 400 – 500 wells. After Lynn Helms started looking at this, we then added this later. This amendment puts more protection in place for the well that may have an issue. If they do not have the proper clay and liner. (10.29)

Ron Ness, President of ND Petroleum Council: **(see Attch #5) (inaudible 12.00-18.50).**
Sen. Oban: With this language, does the surface owner get notified if the spill is less than 10 barrels?
Ron: No. No notification under the bill.
Sen. Schaible: Is it recorded somewhere? (19.39)
Ron: The inspection notice is on file and that was a change to bill. If not cleaned up the inspector will find it and in that file.
Sen. Schaible: So the information is available. But now it is just a different way of how you find it?
Ron: You are not going to file an official report if under 10 barrels on the pad. There is not a reporting requirement if under 10 barrels and on the pad.

Kathleen Spilman, Mandan, ND, an engineer with Keitu Engineers & Consultants, Inc.: **(see Attch#6)** I recommend a do pass on this bill.
Sen. Oban: Of the numbers that you reported, 80% oil patch related, 76% were contained on site. Do you know how many of those were under 10 barrels?
Kathleen: It works out to about half. About 500 were unreportable of the 1200 or so.
Chairwoman Unruh: Any more in support? Any opposed?

Wayne Schafer, Conservation Organizer for Dacotah Chapter of Sierra Club, Bismarck, ND: **(see Attch#7and #8).** (28.15-31.00) Here opposed to HB 1151. Please Do Not Pass.

Troy Coons, ND Landowners**:** We represent about 500 farms and ranches and property owners. We are a non-profit volunteer board. The EERC Study in 2015 outlined and recommends that spills need to be reported. Data should be collected continually to determine the root causes of spills. This needs to be done by an agency to report the data to eliminate redundant and misleading data. The goal should be zero spills. We think the trigger should be 3 barrels instead of 10 barrels. This property is still the landowners and in the end, the possibility of liabilities that are left on this land will end up with us. Not the companies. Let's use the data better. (31.09-37.44)
Vice Chair Kreun: What is the chemical pad response for chemical spraying when you are loading your sprayers? Do you have a chemical pad and have an amount that you can spill without recording on that pad when you load your sprayer?
Troy: That is commercial. You are talking private versus commercial. I do not know that requirement.
Vice Chair Kreun: Why are we singling out an industry when the hazards of spraying, which I did for 19 years, that gives people disease, premature death, and you do not know the difference but you do know what the oil is and why?
Troy: That is why I am here today was to represent what is in this bill.

Kayla Pulvermacher, ND Farmers Union: We are opposed to the amendment and impermeable and adds definition. Impermeable is too ambiguous. We want added definition.

Patty Jensen, Tioga, ND: I am a landowner and oppose this bill. (42.45-00) I farm and ranch north of Tioga, ND. I do live in an area with lots of old oil fields and we are starting to see the results. We have done lots of water tests. We drink the water by our place. She explained the bacteria and how it acts. The high sodium chloride levels affected the bacteria. Cows

have to drink the water. (She is too close to mic so cannot understand) Oil sitting on plastic, weakens the plastic. How does clay be permeable? (Cannot understand) (**Attch#10**)

Chairwoman Unruh: Any more opposed? Any agency? Seeing none, close the hearing.

(**see Attch#9** – Kevin Herrmann left with committee)
(**see Attch#10**-delivered after committee – Patty Jensen)

2017 SENATE STANDING COMMITTEE MINUTES

Energy and Natural Resources Committee
Fort Lincoln Room, State Capitol

HB 1151
3/23/2017
Job# 29585

☐ Subcommittee
☐ Conference Committee

Committee Clerk Signature	

Explanation or reason for introduction of bill/resolution: Relating to the reporting of well pad or oil gas production facility fluid spills.

Minutes: Comm. wk. Atch#1=Lynn Helms

Chairwoman Unruh: We have HB 1151. To limit the reporting requirements for spills on a well pad site. Sen. Oban and I looked at this a bit and had a conversation with Mr. Helms to see if we could alleviate our concerns. I did not come up with anything.
Sen. Oban: I am still trying to alleviate my concern. I don't know that it can be. I called a number of people from my hometown to see what they thought about this. They do not want this to be a motivator to now push 10 barrels to 12 barrel and not report it. I think the surface owner deserve to know about spills regardless of the size of the spill. I fear that a year from now we will see great ND is because of how much we have reduced our spills. The report will be inaccurate. I do not want to see that headline and I know that will be the headline.
Vice Chair Kreun: I understand your concern. This is singling out an industry on here. You haul anhydrous down the road, and pull behind your pickup with no special license requirements. You are spraying out in the field and a hose breaks and pump chemical on the ground, there is no reporting. In large commercial areas, when they spill, they are on pad and they pick it up. They can spill a lot more than 30 gallons on a pad. I have been in that business 19 years. (3.49) I think we will be reporting more than the feds even requires in the oil industry. We don't know what goes out in hazardous waste at hospitals. No one records that. This bill is ok because we are still reporting more than what the federal standards say. These pad are lined. You are correct, it will come out in the news. Maybe it was false to begin with. (5.00)
Sen. Oban: I don't disagree with much of what you said. I don't want to be an alarmist. I will not feel well, a year from now, if we don't tell the whole story. We will actually be reporting fewer. I will be very irritated when I see that headline. I hope reporters will do a better job on that. (8.10) I did ask for the form. I am torn with this bill.
Chairwoman Unruh: Mr. Helms can help us with this issue. We should be able to compare apples to apples. We, as a committee, can evaluate the moving forward whether or not there is a reduction.
Sen. Armstrong: There are a lot of people frustrated with all the gallons of oil spilled on a pad over the last 10 years. You need to take into context what else we have done. This bill has a hard stop date, and that's when the lining requirements went into the Industrial Commission rules. Anything prior to that is still going to have to be reported. Only after that

hard stop date. We had a significant administrative rule rewrite in the last interim. We have the most comprehensive oil and gas regulation in the country now. Are we protecting the environment? I don't care if they spill 8 barrels. If it happened 30 times, then I want to know and there may be a bigger issue. This bill makes a lot of sense.
Chairwoman Unruh: I agree with two points. We do have some of the best laws and regulations on the books. I am frustrated at the level of reporting we do have now. I think it helps with the alarmists use. I think we should be proud of what is happening in the oil patch.
Sen. Oban: Mr. Helms is here. Can you share and separate out in the last year or two how many spills have been reported under the 10-barrel rule, and how many over the 10?
Lynn Helms, Director of Dept. of Mineral Resources: I only have 2016 calendar year data. In 2016, on pad spills, 69% were less than 10 barrels. A bit over 2/3 of the spills; 1258 spills and 2/3's of those were less than 10 barrels. The 1258 were on a pad. You asked a question of how are we going to track the change. This is a screen shot **(see Attch#1**) of our field activity system. We are already implementing this. (14.30) Everything is on this and it is daily. We will be able to track numbers of spills that inspectors find that should have been reported and weren't or that should have been cleaned up by the time the inspector showed up, and were not. Easy to identify the bad actors.
Sen. Armstrong: 1258 spills on pad. That 69% is only on pad?
Lynn: Correct. I can get you the number off pad. It is a smaller number. I do not have that with me right now but can get the information for you. (16.44) This bill would not affect that at all. We camp are to Alaska with off pad spills reporting. We like is this bill will put us on the same playing field with the other state around us and the federal government. We won't be able to compare ND past history with ND future that well, all though you can put and * in the record book. A fairer comparison to other states.
Sen. Armstrong: All pipeline spills will be reported.
Lynn: Yes.
Sen. Oban: What don't you like in this bill?
Lynn: We are going to have to up pour game in the field activity system. Our inspectors will have to more rigorous about looking for unreported spills and uncleaned up spills. Also have to make modifications to our data base to track those. We will have to do more rigorous testing of the well pad at the end of its life. Not a bad idea in the first place. (19.16)
Sen. Oban: Is there a guarantee to landowners, that you will do that more rigorous test at the end of the life?
Lynn: We have recently written an inspector guidance document which included exactly what you said. The legislature has been good to us. When I took this job, I had zero reclamation inspectors. I now have two.
Sen. Armstrong: We hope we are not reclaiming these for at least 70-80 years. The reclamation will be more significant anyway just because the nature of the super pad compared to the old single lined pad like old ones. What is the biggest pad location you have seen so far?
Lynn: It has 25 wells on it and a production facility. The reclamation requirements are increasing anyway. (22.16)
Sen. Armstrong: The overall economic footprint in the area is small, but the pad footprint is larger now, right?
Lynn: Correct. The 25 well pad is 12 acres. In the old days, single well pad was 1 to 2 acres. When you look at the overall footprint, the historic oil field took over 10% of the landscape for well pads. The modern footprint is between ½ percent and 1%. (23.06)

Chairwoman Unruh: On the amendment that was brought to us. Did you like it during the hearing?
Lynn: I did not appear. I sat and listened. We think the amendment is a big positive for us. The way the bill came to you, all of the sites in ND would have to be looked at, 17,000, to see if there is sufficient impermeability. This provides a bright line test and says the ones constructed before this date, it does not get the relief. If it is ones of the 14,346 that were constructed after, it does. Makes it easier on our inspectors. There is not such a thing as impermeable. (24.52) We are talking about a temporary process. Nothing changed to rule about cleaning it up.
Sen. Armstrong: I move a Do Pass on the amendment to HB 1151. **Sen. Cook**: I second.
Sen. Roers: Don't we need addition language?
Sen. Armstrong: That is what the rule change was. The date implies that because the rule change that happened on that date has those words in it. It takes care of trying to define sufficiently, impermeable etc. It is defined by the rule change September, 2001.

Chairwoman Unruh: We have the amendment. All in favor, say Yea, all opposed, same sign.
Amendment passed.

Chairwoman Unruh: In front, we have amended HB 1151.
Sen. Oban: Can you hold this until this afternoon?
Chairwoman Unruh: Sure

Committee did not vote.

2017 SENATE STANDING COMMITTEE MINUTES

Energy and Natural Resources Committee
Fort Lincoln Room, State Capitol

HB 1151
3/23/2017
Job #29626

☐ Subcommittee
☐ Conference Committee

Committee Clerk Signature Pam Dever

Explanation or reason for introduction of bill/resolution:

Minutes: Comm.wk.

Chairwoman Unruh: We talked about HB 1151 this morning. We amended it and have in front of us.

Sen. Armstrong: I move a Do Pass as amended. **Vice Chair Kreun**: I second.

Chairwoman Unruh: Any committee discussion?
Sen. Oban: I can't decide on this so I will come down on the other side. I think cutting back on what we will report is not good.
Chairwoman Unruh: More discussion? Call the roll on Do Pass as amended on HB 1151.

YES 6 NO 1 -0- absent. Passed.

Chairwoman Unruh will carry the bill.

CJ
3/23/2017
1 of 1

17.0060.05001
Title.06000

Adopted by the Senate Energy and Natural Resources Committee
March 23, 2017

PROPOSED AMENDMENTS TO ENGROSSED HOUSE BILL NO. 1151

Page 5, line 20, replace "and" with an underscored comma

Page 5, line 21, after the first "the" insert "site or"

Page 5, line 21, remove "or site and the facility or site has impermeable base material"

Page 5, line 22, replace "and containment" with ", and is on a well site where the well was spud after September 1, 2000, or on a facility, other than a well site, constructed after September 1, 2000"

Renumber accordingly

Date: 3/23/17
Roll Call Vote #: 1

2017 SENATE STANDING COMMITTEE
ROLL CALL VOTES
BILL/RESOLUTION NO. HB 1151 engrossed

Senate Energy and Natural Resources Committee

☐ Subcommittee

Amendment LC# or Description: 17.0060.05004 Rep Anderson .05001

Recommendation: ☑ Adopt Amendment
☐ Do Pass ☐ Do Not Pass ☐ Without Committee Recommendation
☐ As Amended ☐ Rerefer to Appropriations
☐ Place on Consent Calendar

Other Actions: ☐ Reconsider ☐ _____

Motion Made By Sen. Armstrong Seconded By Sen. Cook

Senators	Yes	No	Senators	Yes	No
Chairman Jessica Unruh			Sen. Erin Oban		
Vice Chair Curt Kreun					
Sen. Kelly Armstrong					
Sen. Dwight Cook					
Sen. Jim Roers					
Sen. Don Schaible					

Voice Vote

Total (Yes) _____ No _____

Absent _____

Floor Assignment _____

If the vote is on an amendment, briefly indicate intent:

All Yes Amend Passed

(These passed in a.m. session)

Date: 3/23/17
Roll Call Vote #: 2

2017 SENATE STANDING COMMITTEE
ROLL CALL VOTES
BILL/RESOLUTION NO. HB 1151 engrossed

Senate Energy and Natural Resources Committee

☐ Subcommittee

Amendment LC# or Description: 17.0060.05001 Rep. Anderson

Recommendation: ☐ Adopt Amendment
☑ Do Pass ☐ Do Not Pass ☐ Without Committee Recommendation
☑ As Amended ☐ Rerefer to Appropriations
☐ Place on Consent Calendar

Other Actions: ☐ Reconsider ☐ _____

Motion Made By Sen. Armstrong Seconded By Sen. Kreun

Senators	Yes	No	Senators	Yes	No
Chairman Jessica Unruh	✓		Sen. Erin Oban		✓
Vice Chair Curt Kreun	✓				
Sen. Kelly Armstrong	✓				
Sen. Dwight Cook	✓				
Sen. Jim Roers	✓				
Sen. Don Schaible	✓				

Total (Yes) 6 No 1

Absent -0-

Floor Assignment Sen. Unruh

If the vote is on an amendment, briefly indicate intent:

Sen. Unruh carry

(this passed in pm meeting)

REPORT OF STANDING COMMITTEE

HB 1151, as engrossed: Energy and Natural Resources Committee (Sen. Unruh, Chairman) recommends **AMENDMENTS AS FOLLOWS** and when so amended, recommends **DO PASS** (6 YEAS, 1 NAYS, 0 ABSENT AND NOT VOTING). Engrossed HB 1151 was placed on the Sixth order on the calendar.

Page 5, line 20, replace "and" with an underscored comma

Page 5, line 21, after the first "the" insert "site or"

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Page 5, line 22, replace "and containment" with ", and is on a well site where the well was spud after September 1, 2000, or on a facility, other than a well site, constructed after September 1, 2000"

Renumber accordingly

2017 TESTIMONY

HB 1151

Roscoe Streyle
Dist 3 Minot
HB 1151
1-12-17
#1

Testimony HB 1151

Rep. Roscoe Streyle, District 3

January 12, 2017

Chairman Porter and House Energy and Natural Resources Committee Members:

This bill relates to required reporting of spills (fresh water, brine, oil, gas and other fluids) in the oil and gas industry, adding a new section to NDCC 38-08-04. There is no statutory requirement to report currently, but rather in agency policy. This should be a legislative decision not an agency decision. This bill clarifies and simplifies the reporting requirements and will make Government more efficient while providing more accurate data.

Currently, the industry is required to report ALL spills no matter the volume, type of fluid or location of the spill. The Federal Government requires reporting if the incident is 10 barrels or more, this applies to both On and Off pad incidents. ND is the most restrictive in the nation. By doing so state agencies are spending valuable time and money for no real benefit or purpose. This bill ONLY applies to spills ON pad and if passed would still result in ND being more restrictive than the Federal Government.

The state needs staff to process all the unnecessary reports, staff to travel to and from to monitor the spill and staff to draft press releases. Let's instead focus our finite resources more wisely and tactfully, focusing only on spills that are off pad, greater than 10 barrels and may have an impact to environment. Spills ON pad have ZERO impact on the environment.

Gov. Burgum has spoken many times about the need to transform government, make it more efficient and responsive, this bill fits those missions. It will reduce the cost of government, removes burdensome requirement, clarifies the reporting requirements and will improve the quality of data used by policymakers when making public policy decisions.

The typical well pad size in the Bakken field is between 5-9 Acres and a spill <=10 barrels is unnoticeable and these pads/sites are designed to capture and retain spills. Other speakers will have photos and more information on the design aspects of well pads.

Federal Government - 10 barrels On or Offsite

Oklahoma - 10 barrels On or Offsite

Texas - 5 barrels On or Offsite

North Dakota - 0 barrels On or Offsite - Propose changing to 10 barrels ON site ONLY.

Oil Well Pads, Production Facility or Production-Related Handling Facility

- Well pads, natural gas plants, production storage sites, tank batteries and saltwater disposal facilities are a few examples that this bill would apply too.

Health Department Data

2016: 1,248 spills reported in Oilfield Database:

	Stayed on Pad	Off Pad	Tribal Lands	Total
Total Spills	737	357	154	1248
10 Barrels or Less	517	257	133	907
No Quantity	112	97	50	249

"Of the 112 spills that stayed on pad and had no quantity I have been able to determine that 54 of them were 10 barrels or less and 29 were due to fire with no fluids hitting the ground. 44 of those were greater than 10 barrels. I have not been able to determine a volume on the remaining 2.

So for the purpose of the proposed bill (HB 1151) a total of 571 spill were 10 barrels or less and remained on the well pad.

Since the NDDoH does not have jurisdiction on tribal lands I do not have accurate data on the number that stayed on pad. Of the 154 tribal spills 118 were reported as being on pad. I do not have how many on pad spills were 10 barrels or less. But 100 would be a good, though rough estimate."

Spill Summary – 571 + 100 = 671 on pad spills 10 barrels or less.

671/1248 = 53.76% of all spills occurred on pad and were 10 barrels or less.

mmary

1. Make government more efficient.
2. Match State Law with Federal Law for ON pad reporting, ND still more restrictive.
3. Cost saving measure for the state, let's use are finite resources more wisely. Focus resource where they should be and that is pills that pose risk to health, safety and environment.
4. Clarify the law, Federal vs. State reporting requirements causes confusion.
5. Well Pads are designed to handle spills; another speaker will address well pad design.
6. 53.76% of "spills" were on Pad and under 10 barrels in 2016. 671/1248
7. This bill ONLY applies to spills on location, does NOT change reporting of Off pad incidents.
8. This bill has nothing to do with cleaning up spills, all must be cleaned up with or without this bill.
9. The Health Department has 5-Full-time and 2-Part-time staff in the spill program and some volunteers.
10. The NDIC has staff that must respond to this events as well.

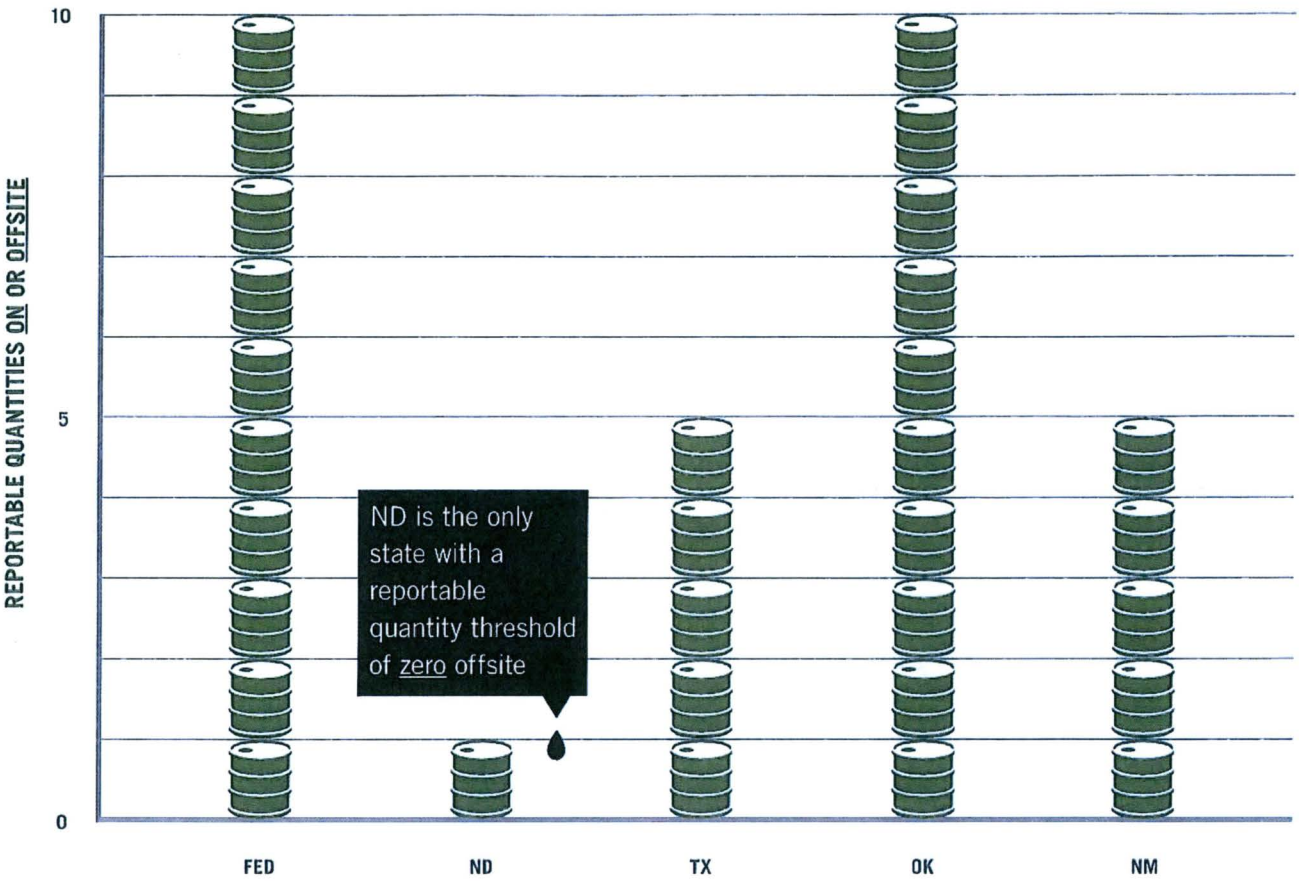
Amendment Suggestion

After reading the whole section a few times, this language might better be placed as a new subsection to 38-08-04.1 rather than a new stand-alone section 2. It seems to fit as g. on page 5 better.

"All persons controlling or operating any well, pipeline, receiving tank, storage tank, treating plant, or any other receptacle or production facility associated with oil, gas, or water production, injection, processing, or well servicing, to report any leak, spill, or release of fluid to the commission. Provided, however, if the leak, spill, or release of fluid occurs on any facility or site listed above, the facility or site has secondary containment, the fluid does not leave the facility or site, and the leak or spill is less than 10 barrels, then no report to the commission is required."

COMPARATIVE STATE-BY-STATE ANALYSIS OF REPORTABLE QUANTITIES (BBL) TO LAND

Top US Oil Producing States (Lower 48)



Federal reportable quantities should set the standard

1. The federal threshold for reporting is 10 barrels, while North Dakota is 1 barrel. North Dakota is wasting tax dollars by inappropriately focusing resources on smaller reportable quantities.
2. Approximately 70% of all releases in North Dakota's database were less than or equal to 10 barrels.
3. North Dakota requires agency reporting for an offsite release of any volume, whereas other states only require reporting when reportable quantities are exceeded.
4. North Dakota's low reportable quantities threshold creates an unnecessary administrative burden.
5. Actual North Dakota volumes are being distorted because of the low threshold for reportable quantities.
6. Regardless of volumes released, all releases are cleaned up.

Well / Facility Operator

Select Operator

Facility ID

Facility Number

Well File Number

Well File Number

Field Name

Select Oil Field

Well / Facility Name

Well Name

Submitters Information

First Name*

First Name

Last Name*

Last Name

Address*

Address

City* **State*** **Zip***

City State (2 character at Zip

Phone*

Phone

Email

Email

Responsible Party

Responsible Party*

Responsible Party

Address*

Address

Address

Address

City* **State*** **Zip***

Responsible Party C State (2 character at Responsible Party Z

Contact Info

First Name*

Contact First Name

Last Name*

Contact Last Name

Telephone*

Contact Phone

Email

Contact Email

Incident Location Information

County*

Select County

Township* **Range*** **Section*** **Quarter** **QQuarter**

Select Township Select Range Select Section Q QQ

Location Description

Description of spill location if not on well or facility site. (0 of 1000 max characters)

General Land Use*

General Land Use

Affected Medium*

Affected Medium

Surface Owner

First & Last Name

Surface Owner Notified

Notification Type

Incident Information

Date of Incident*

Time of Incident*

If date of incident is unknown, enter date of discovery.

Enter time in hh:mm 24-hour military time, or select from list.

Distance From Nearest

Occupied Building **Unit**

Units

Water Well **Unit**

Units

Type of Incident*

Incident Type

Root Cause of Incident*

Root Cause of Spill

Was release contained?*

Was Release Contained

Estimated Release Volume

Oil **Units**

Units

Brine **Units**

Units

Other **Units**

Units

Recovered Volume

Oil **Units**

Units

Brine **Units**

Units

Other **Units**

Units

Description of other release substance

Description of other released substance. (0 of 150 max characters)

Cause of Incident*

Describe cause of spill or fire. (0 of 4000 max characters)

Areal extent of incident if not contained

Immediate risk evaluation.*

Explosive atmosphere, immediate health hazards, etc. (0 of 150 max characters)

Potential environmental impacts.*

Describe impacts or likelihood of impacts to surface water, groundwater, soils, etc. (0 of 4000 max characters)

Action taken and recommened/planned future action*

How spill was contained, action taken to isolate or stop incident, any cleanup activities commenced, evacuation of nearby personnel, emergency approval to burn contaminant, etc. (0 of 4000 max characters)

Where will recovered wastes be disposed?

Where will recovered wastes be disposed? (0 of 1000 max characters)

Other Agencies Notified

- **Local Fire Department**
- **Local Law Enforcement**
- **State Fire Marshal**
- **State Highway Patrol**

Enter additional agencies below.

Enter other agenies notified above. (0 of 250 max characters)

Additional Email Recipients

If entering multiple e-mail addresses, separate them with a semicolon - do not use spaces. (0 of 250 max characters)

Has the incident been or will it be reported to the NRC? 1-800-424-8802.*

Reported to NRC

Pressing enter or the submit button will send an e-mail version of this completed Environmental Incident Report to NDDH Environmental Health Section personnel, ND DES and to NDIC Oil and Gas Division personnel.

Submit Incident Report

Reset Form

Ron Ness
HB 1151 2PM
1-12-17
#2

NORTH DAKOTA
PETROLEUM
COUNCIL
100 West Broadway, Ste. 200 | P.O. Box 1395 | Bismarck, ND 58501-1395
701.223.6380 | ndpc@ndoil.org | www.NDOil.org

House Bill 1151
Testimony of Ron Ness
House Energy and Natural Resources Committee
January 12, 2017

Chairman Porter and members of the House Natural Resources Committee, my name is Ron Ness, president of the North Dakota Petroleum Council. Last year the North Dakota Petroleum Council represented more than 500 companies in all aspects of the oil and gas industry, including oil and gas production, refining, pipeline, transportation, mineral leasing, consulting, legal work, and oilfield service activities in North Dakota. I appear before you today in support of House Bill 1151.

The State of North Dakota has an extremely stringent spill reporting requirement regardless of whether the fluid is contained on the pad or production facility or the fluid is off the pad or production facility. House Bill 1151, if passed, would bring North Dakota in line with what other states and the federal government require.

The Energy and Environmental Research Center (EERC) has conducted extensive research and analysis of spill data in the state. In a report that they released in 2015, they recommended that the State of North Dakota recognize the impact the minimum reporting threshold has on spill statistics and evaluate how to interpret and report these data accordingly. The report observes that North Dakota has among the lowest minimum reporting thresholds of the top seven oil-producing states. This creates the potential to skew the comparison of spills between states with higher reporting thresholds, making it appear that North Dakota has more spills than other oil-producing

states.[1] In fact, when comparing states that have had recent oil booms, North Dakota has performed at par or better than its peer states with regard to spill volumes per unit of production.[2]

Currently, state law requires that the release of any fluid in quantities equaling one barrel (42 gallons) or greater if the spill occurs on the well pad be verbally reported to the North Dakota Department of Mineral Resources (DMR) immediately and that an initial written spill report be submitted within 24 hours with ten-day follow-up. If a spill of any fluid, *including fresh water*, migrates or occurs off the well pad, any and all quantities (there is no minimum threshold) must be reported to the North Dakota Department of Health (NDDoH) immediately.

This threshold is even more stringent than the federal government's. The Bureau of Land Management, which is the regulatory agency in charge of federal surface and federal minerals, has established major event and minor event thresholds. The immediate reporting (within 24 hours) threshold is not triggered until a spill is greater than 100 barrels. A written report within fifteen days is required for "minor events," which are those with quantities of greater than 10 barrels, but less than 100 barrels. If a spill of less than 10 barrels occurs in a non-sensitive area, no report is required.

Bureau of Land Management (BLM) reporting requirements:

1. **Major events >100-barrels:** reporting within 24 hours;
2. **Minor events >10 barrels but <100 barrels:** written report within 15 days;
3. **<10 barrels in non-sensitive areas:** no report required

Comparatively, other states have similar thresholds. In California's San Jochim Valley, five barrels or more must be reported if the spill is not contained, and 10 barrels or more must be

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[1] Liquid Gathering Pipelines: *A comprehensive analysis,* Energy and Environmental Research Center, University of North Dakota, December 2015.
[2] IBID

reported if the spill is contained and not a threat to state waters. One barrel must be reported if it is off of the well pad.

Texas' requirement states that if loss is less than five barrels, reporting is not required unless the spill has created a sheen on water. In New Mexico, a release of five barrels but not more than 25 barrels must be reported within 15 days of discovery. Spills in excess of 25 barrels must be reported verbally within 24 hours. Colorado regulations require reporting within 24 hours of spills of one barrel outside of the berm and five barrels or more inside of a berm, followed up with a detailed report within 10 calendar days. Wyoming has a spill reporting threshold of 10 barrels.

Only Alaska's North Slope has as strict of regulations as North Dakota with three levels of reporting:

1. >55 gallons: report immediately;
2. >10 gallons but <50 gallons: report within 48 hours;
3. >1 gallon but <10 gallons: submitted on monthly report.

One of the reasons these states and the federal government have these higher thresholds for releases that occur on a facility is because they recognize that engineered containment pads provide the necessary protection to make reports of these minor spills unnecessary.

Engineer designed for fluid containment:

Two-thirds of the spills or releases in 2016 occurred on specially designed and constructed facility pads and were completely contained within the pad boundaries. These facilities are designed to provide containment for fluids generated and stored on location. A spill on a pad is similar to spilling juice on a coffee tray or cookie pan. The lip around the perimeter of the tray is similar to a perimeter berm or containment dike on the location: the milk spilled is contained on the

tray in an area designed for containment, which makes it easy to clean up. Just as a tray eliminates any potential damage to your carpet or furniture if juice is spilled, a production or processing pad containment eliminates potential damage to health, safety, or the environment.

To further illustrate, the average well pad in North Dakota has seven wells and a tank battery. The average well produces 500 to 1,000 barrels of oil per day. The quantity of fluid produced on the pad is taken into the design considerations in containment design. Every new well pad is now required by the NDIC to install and maintain a 6-inch perimeter berm. For an 8.5 acre well pad, this equates to 30,000 barrels or more of fluid general site containment. In additional to this requirement, specific site containment around tanks is dictated by the NDIC and the EPA. Saltwater disposal well pads and processing facilities follow the same or similar design specifications for spill containment, taking into account the quantity of fluids produced on location that may need to be contained for ease of cleanup. With facility pads engineered to manage thousands of barrels of produced fluids, containment of a 10-barrel spill is well within its design parameters. As was illustrated earlier, a 10-barrel spill on the average seven- to eight-acre well pad would be similar to a few drops of juice spilled on your tray. If a release does occur on the facility's pad, the vast majority are contained within the designed containment areas. The spill is vacuumed and any recovered crude oil is put back into battery tanks or gathering pipelines and sold. Any waste, as well as the impacted surface material is removed and properly disposed of as authorized by the NDIC. The impacted surface material is then replaced.

How pads protect the environment:

During oil and gas facility construction, the top soil and subsoil are stripped from the area and stored separately for future use or future reclamation of the well site. The area is compacted to

design specification and clay liners and/or synthetic liners are applied to create an impermeable fluid barrier and prevent the spill from penetrating below the pad surface. The development area for an oil and gas facility (including well pads) is then contoured to design and landscaped to provide a surface that will only allow fluids to flow in the desired direction(s), allowing proper management and containment of spills and storm water or meltwater. This may require sloping the pad away from any surface water, rivers or creeks. Dikes and berms around storage tanks and heater treaters, as are secondary containment dikes as required by EPA. Six-inch perimeter berms are considered tertiary containment for all newly constructed pads or may be required to be added retroactively by the DMR.

Storm water and snow melt water are contained within the well pad dike system and can only be discharged from the well pad once it has been determined that it does not contain any potential contamination of saltwater or hydrocarbons.

The oil and gas industry is required by federal and state agencies to provide several layers of containment. These include:

- Specific Site Containment;
- EPA – Tanks are required to have an impervious berm/dike that is 110% of the largest tank OR largest tank volume plus freeboard;
- NDIC – Tanks are required to have a berm/dike that is largest tanks plus one day's fluid production;
- NDIC – Tank Batteries are required to have a 6-inch perimeter berm;
- General Site Containment;

- EPA – Must have containment for most likely spill event around all oil handling equipment. This many include retention areas, open berms, retaining walls, curbing, designed drainage systems, drip pans, etc.

Industry takes containment to another level:

In many cases, oil and gas operators design secondary and tertiary containment for storage tanks that are above and beyond regulation (specific berm directly around tanks and perimeter berm). The tanks may also be provided another level of containment depending on pad design if there are retention areas on pad. There may even be multiple containment structures provided for other equipment on pads if the operator chooses to berm around treaters or LACTs.

North Dakota's current reporting requirement does not acknowledge the extensive planning and protections that are inherent in these specially engineered and designed facility pads. As noted, releases that occur on these pads are similar to spilling juice or coffee on a coffee tray: the spill is contained and quickly and easily cleaned up.

Rather than having state agencies use valuable resources on responding to these contained pads that have no impact to the environment, it would be more prudent for agencies to focus their time and resources on the 33% of the spills that occur off the tray or containment pad. These have a potential to impact the environment and require the full attention of regulators. It should be noted that the reporting threshold for these spills will NOT change under this bill. The North Dakota Industrial Commission did not change the reporting threshold in their rule-making, but instead left that decision to the North Dakota Legislature, and as a result, HB 1151 is before you.

House Bill 1151 will focus the state resources on spills that have the potential to directly impact the health, safety, and environment. The bill will not change the fact that the responsible

party is still liable for spill clean-up and remediation, which can be as simple as vacuuming or scooping the spill and replacing pad surface material if the release occurs on a pad.

The spills we are discussing today are minor spills that occur on an engineered pad with containment, pose no environmental risk and are easily cleaned up. They are not a major catastrophe and this is evidenced by the federal government, several other states, and the EERC study which have all determined this reporting requirement as good practice.

We urge a Do Pass on House Bill 1151. I would be happy to answer any questions.

17.0060.04001

PROPOSED AMENDMENTS TO HOUSE BILL NO. 1151

This language might better be placed as a new subsection to 38-08-04.1 rather than a new stand-alone section 2. It seems to fit as g. on page 5 as read as such:

"All persons controlling or operating any well, pipeline, receiving tank, storage tank, treating plant, or any other receptacle or production facility associated with oil, gas, or water production, injection, processing, or well servicing, to report any leak, spill, or release of fluid to the commission. Provided, however, if the leak, spill, or release of fluid occurs on any facility or site listed above, the facility or site has secondary containment, the fluid does not leave the facility or site, and the leak or spill is less than 10 barrels, then no report to the commission is required. "

Renumber accordingly

#3 HB1151 1/12/17 #3 Ron Ness

EERC
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Putting Research into Practice

SPILLS CLEANUP PRIMER

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RESPONSIBLE • SAFE • SECURE • DYNAMIC

EERC
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Putting Research into Practice

This primer is intended to provide the reader with a fundamental understanding of hydrocarbon and brine spills from oil and gas production and the related remediation and reclamation of these spills.

As oil and gas production in the Williston Basin has increased, the number and volume of spills have also increased. Although this simple statement is accurate, it only provides a partial representation of the issue. Read on to learn more about spills, how spills are regulated, measures taken to minimize their impacts, and how spills are cleaned up.

Material presented in this document regarding techniques, processes, and technologies to address spills is intended to be informational; actual performance of spill-related activities will vary.

Bradley G. Stevens, P.E.
Research Engineer
Energy & Environmental Research Center

Acknowledgments

The Energy & Environmental Research Center (EERC) and North Dakota State University (NDSU) would like to thank the following people and organizations for their invaluable contributions to this document:

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Notice

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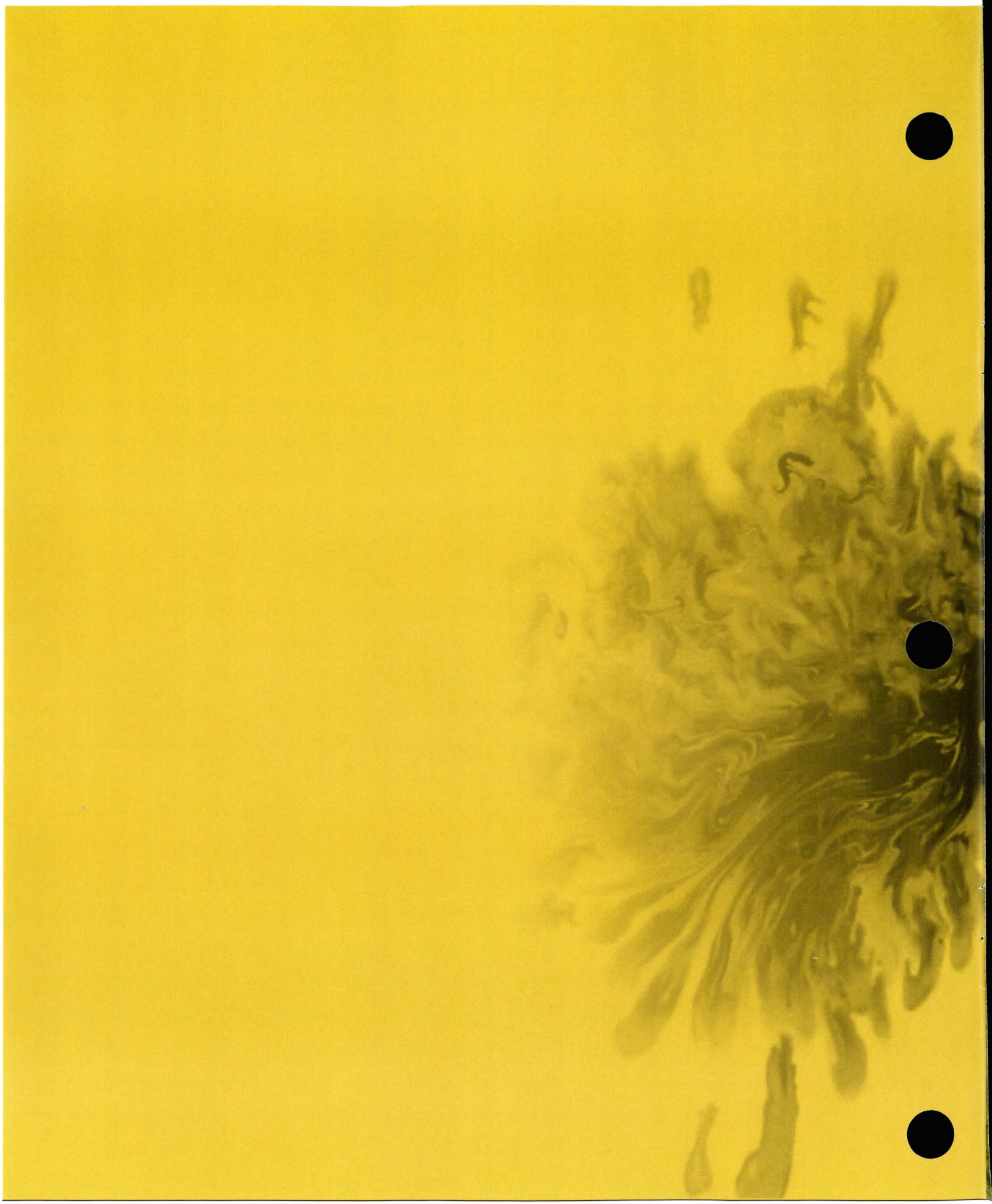
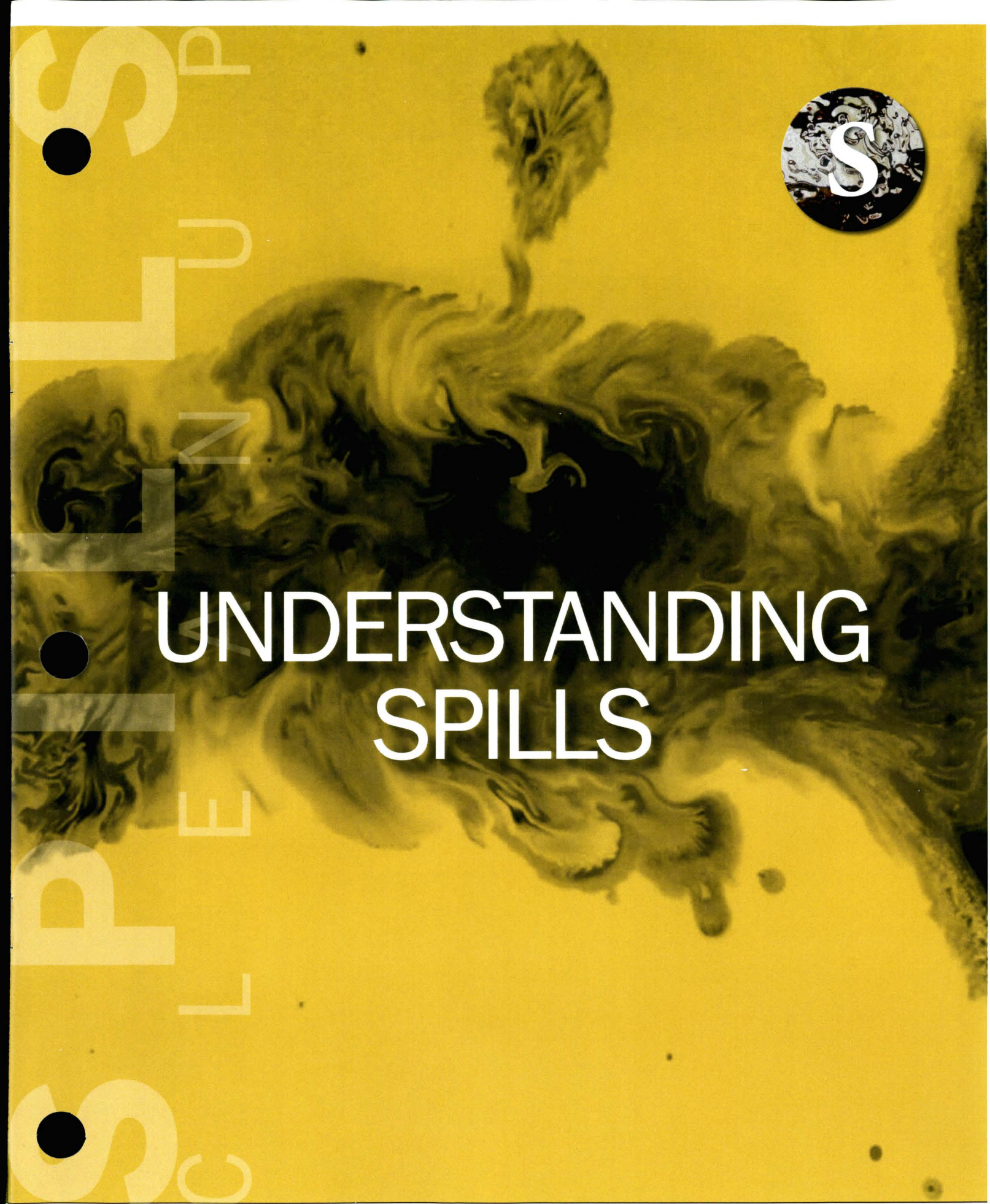
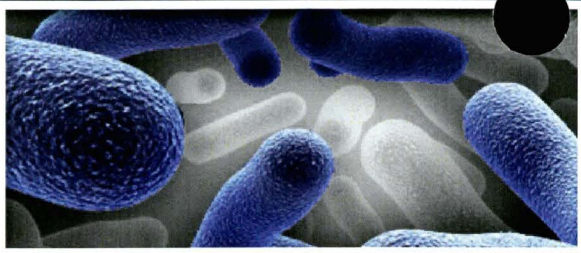




UNDERSTANDING SPILLS

Definition of Terms

Bioremediation – a process by which organisms in the soil break down soil contaminants.



Brine – water produced with oil and gas that is typically high in sodium chloride.

EC – electrical conductivity, a measure of how well soil conducts electrical current. Soil salinity is measured indirectly using EC.

End points – quantifiable thresholds that determine when a site has been completely remediated and/or reclaimed.

Halophytes – plants that are more tolerant of saline conditions.

Landfarming – a bioremediation process where an environment is created to allow naturally occurring organisms in the soil to break down hydrocarbons (primarily in an aerobic environment). This is accomplished by incorporating nutrients, amendments, and oxygen into the soil with tillage while maintaining adequate moisture.

Phytoremediation – the direct use of green plants and their associated microorganisms to stabilize or reduce contamination in soils, surface water, or groundwater.

Reclamation – the act of returning land to its natural or productive state.

Remediation – the act of correcting an environmental disturbance, typically a produced fluid impact (i.e., oil and brine).

Saline – a description of soluble salts in water and soil (i.e., Ca, Mg, Na, K, Cl, NO_3, and SO_4).

Salt – pertains to sodium chloride in produced water/brine.

SAR – sodium adsorption ratio, a measure of the sodic content of soil, or the ratio of sodium to calcium and magnesium.

Sodic soil – soil that contains sufficient sodium to interfere with the growth of most crop plants.

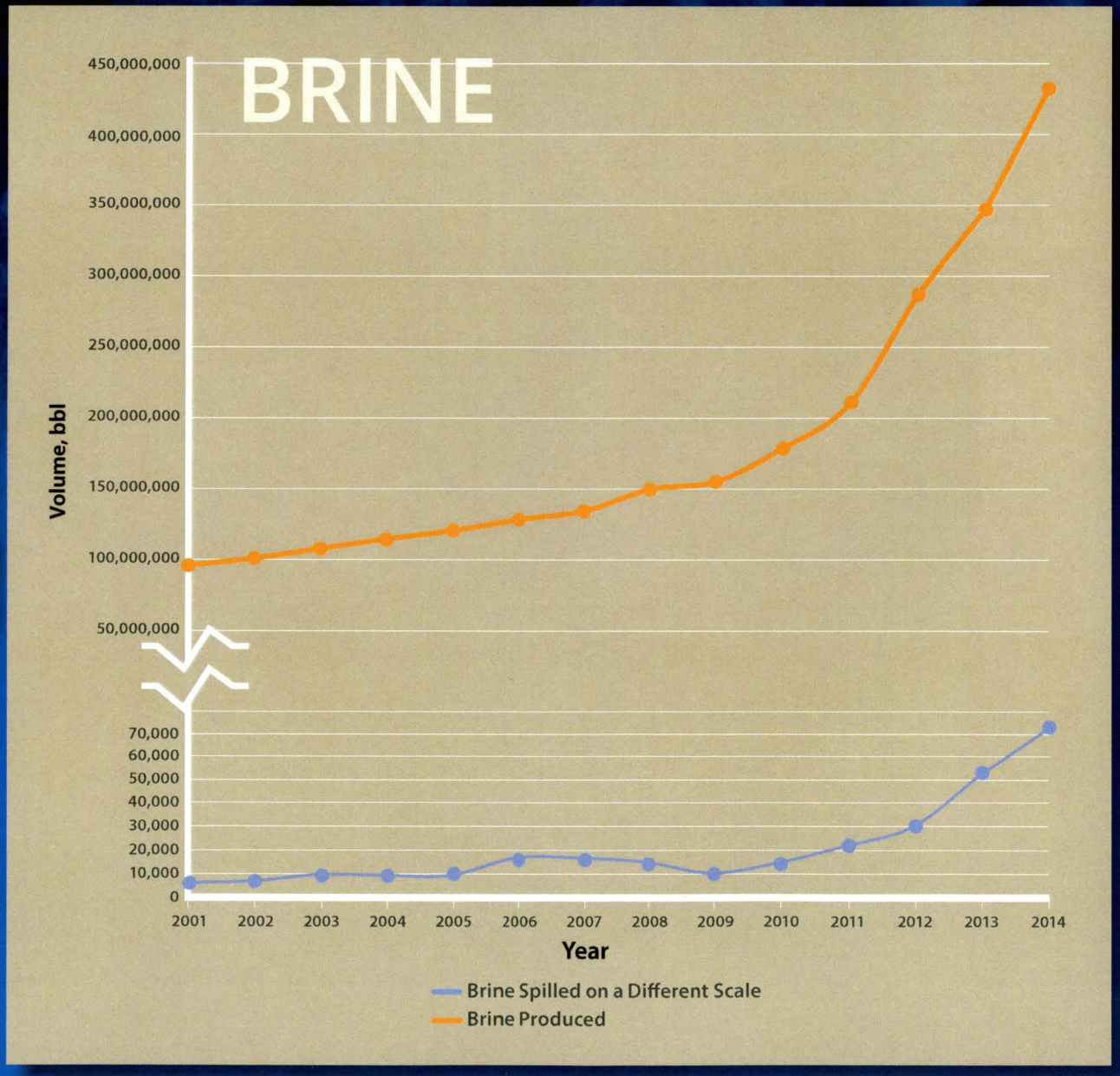
TPH – total petroleum hydrocarbons, a measure of the quantity of oil-related compounds in a given quantity of soil.

Spill Statistics

Data presented were obtained from the North Dakota Department of Health (NDDH) Oilfield Environmental Incidents database. Analysis was performed on spill data from 2001 through 2014, representing approximately 7 years prior to development of the Bakken Formation and 7 years after Bakken development.

Oil and saltwater spills represent only 0.01% of their respective volumes extracted, which means the industry safely produces and transports over 99.99% of the volume it handles.

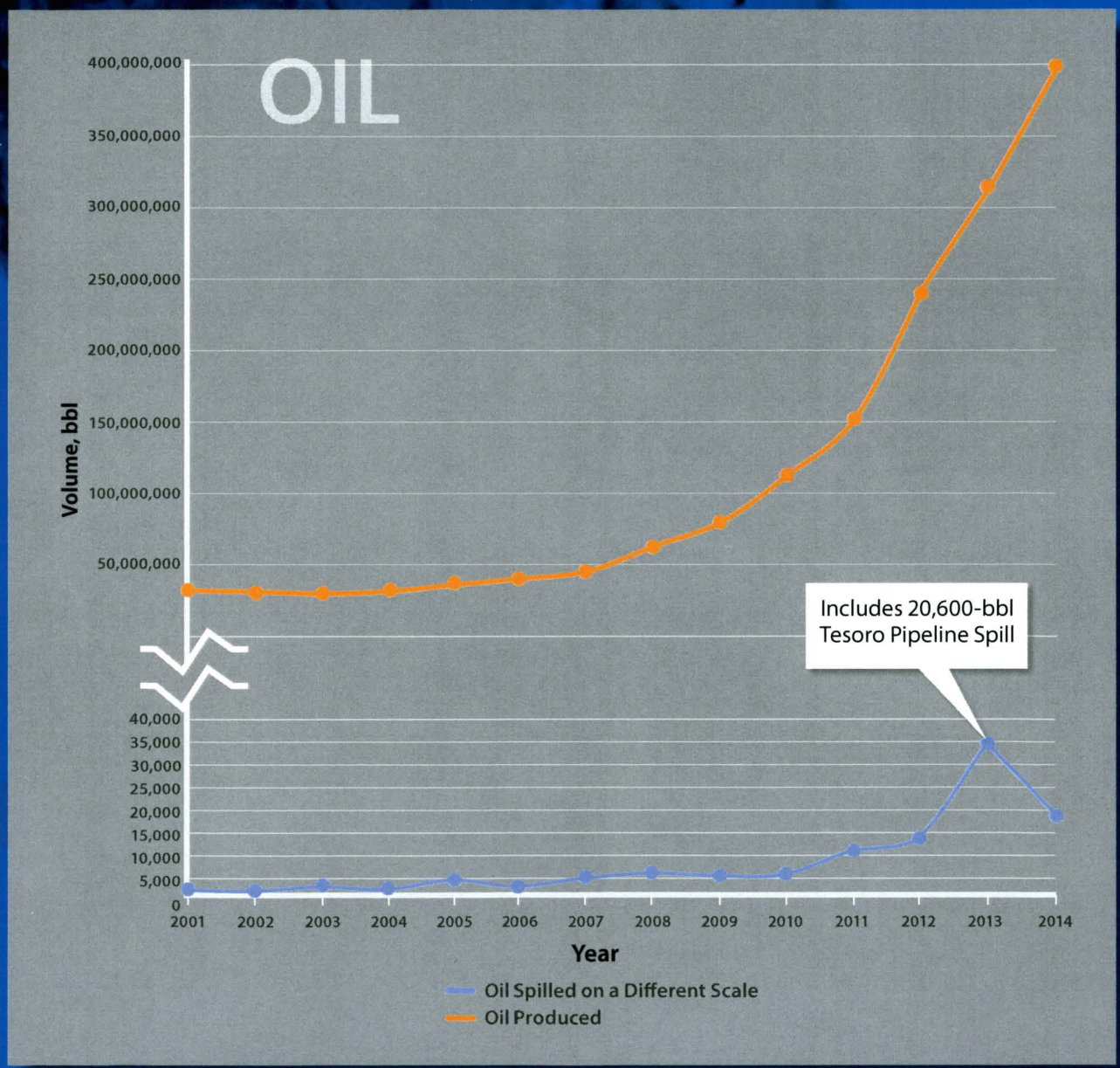
75%–80% of all spills are contained (meaning the spill does not leave the bermed production location).



From 2001 through 2014, greater than 91% of the spills were less than 100 barrels in size and represent approximately 20% of the spilled volume. Conversely, 9% of the spills were greater than 100 barrels in size and represent 80% of the spilled volume.

Annual brine spill volumes have been typically 2–3 times more than the annual volume of oil spills.

Beginning in 2011, freshwater spills have become a significant portion of the "other" category of spills as well as the total spill volume. From 2011 to 2014, freshwater spills represented 24% to 90% of the "other" category of spills and between 4% and 43% of the total annual spill volume (i.e., the 2013 freshwater spill volume was 69,644 barrels or 43% of total annual spill volume and more than either the oil or brine spill volume that year).

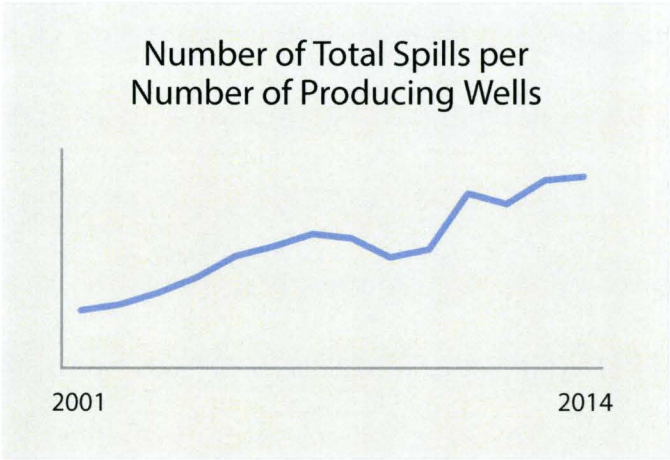


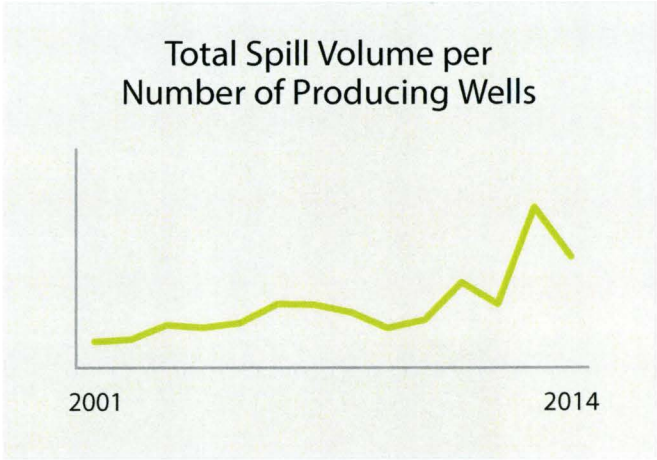
Spill Statistics (continued)

The total annual number and volume of spills have increased, although the number of spills and annual spill volumes as a function of oil extracted are essentially unchanged from the year 2001 and have decreased since peaking in the years 2006 and 2007.

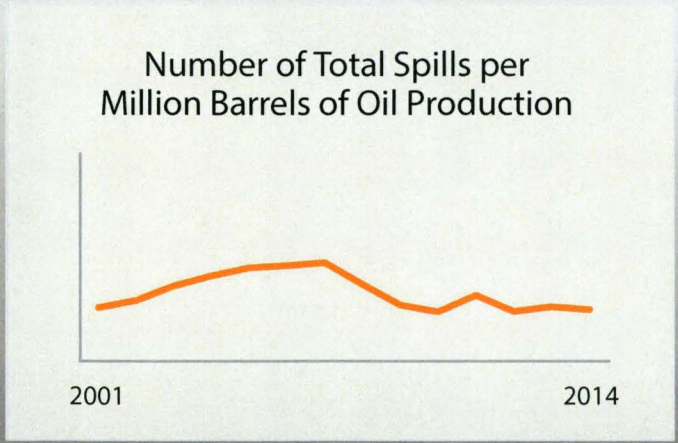
To this point, the annual spill data from 2001 through 2014 are presented two ways (note that the spike in spill volume in 2013 is largely due to the 20,600-barrel Tesoro pipeline release as well as nearly 70,000 barrels of freshwater spilled).

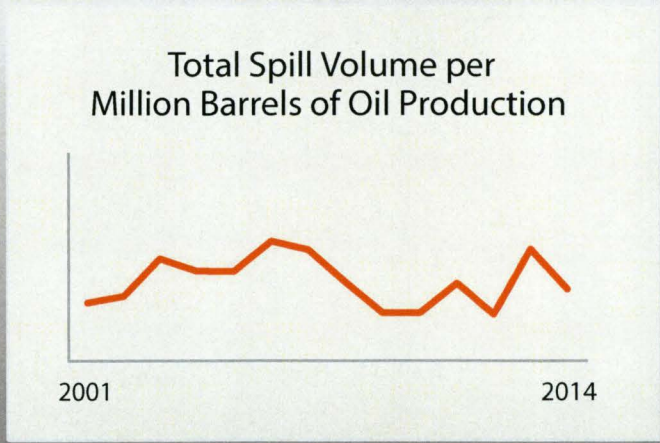
These two graphs are the annual number of spills and spill volumes as a function of the number of producing wells.





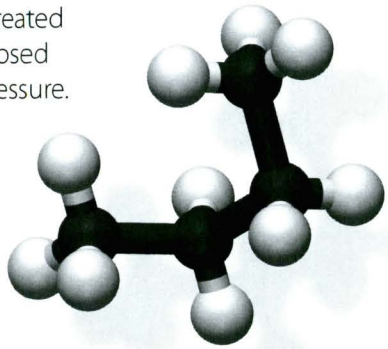
These two graphs are the annual number of spills and spill volume as a function of the annual oil production in million barrels.





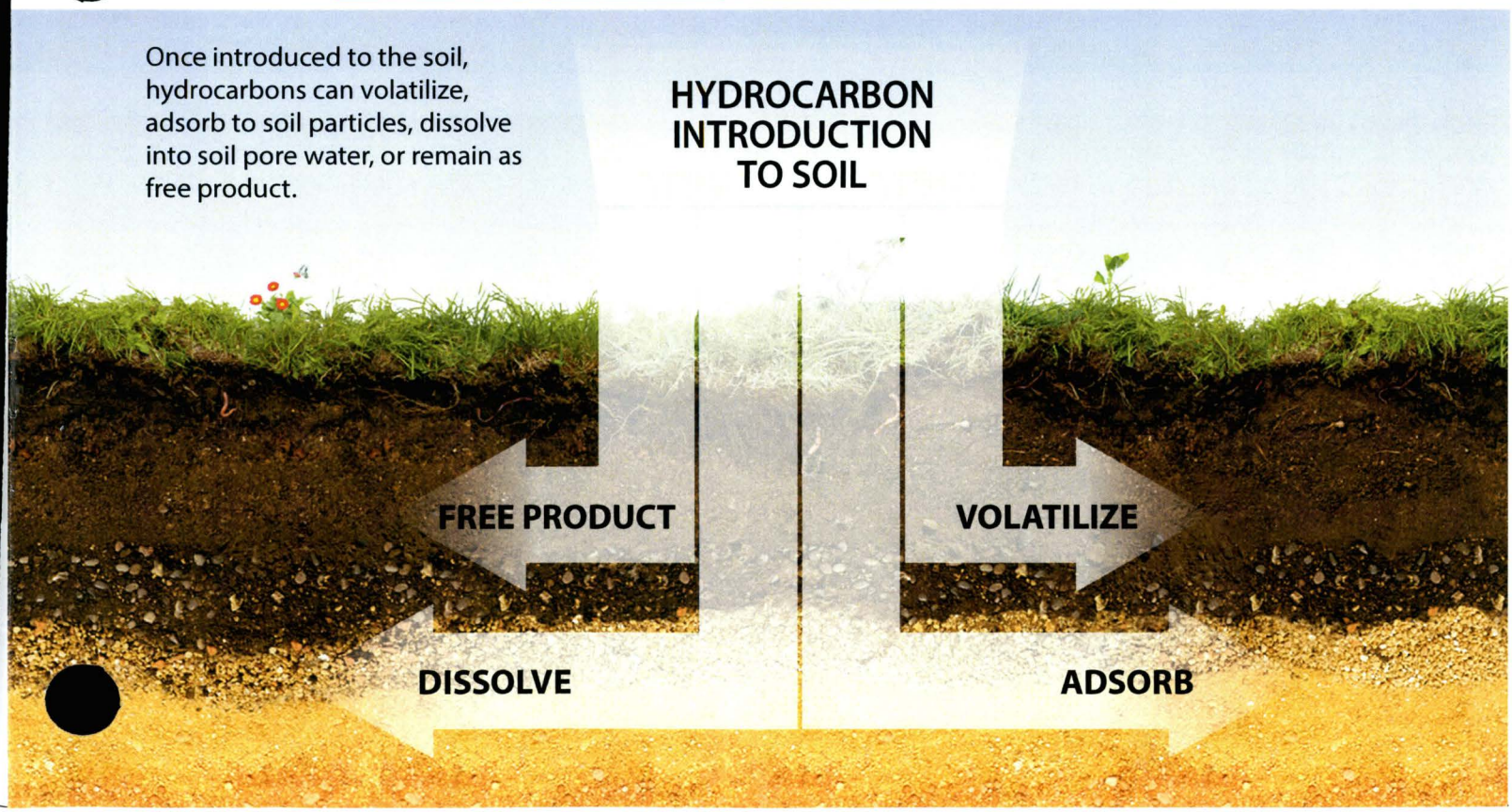
Hydrocarbon Interaction with Soil

Crude oil is a complex mixture of hydrocarbons created when dead organisms from the past are decomposed over long periods of time under high heat and pressure.



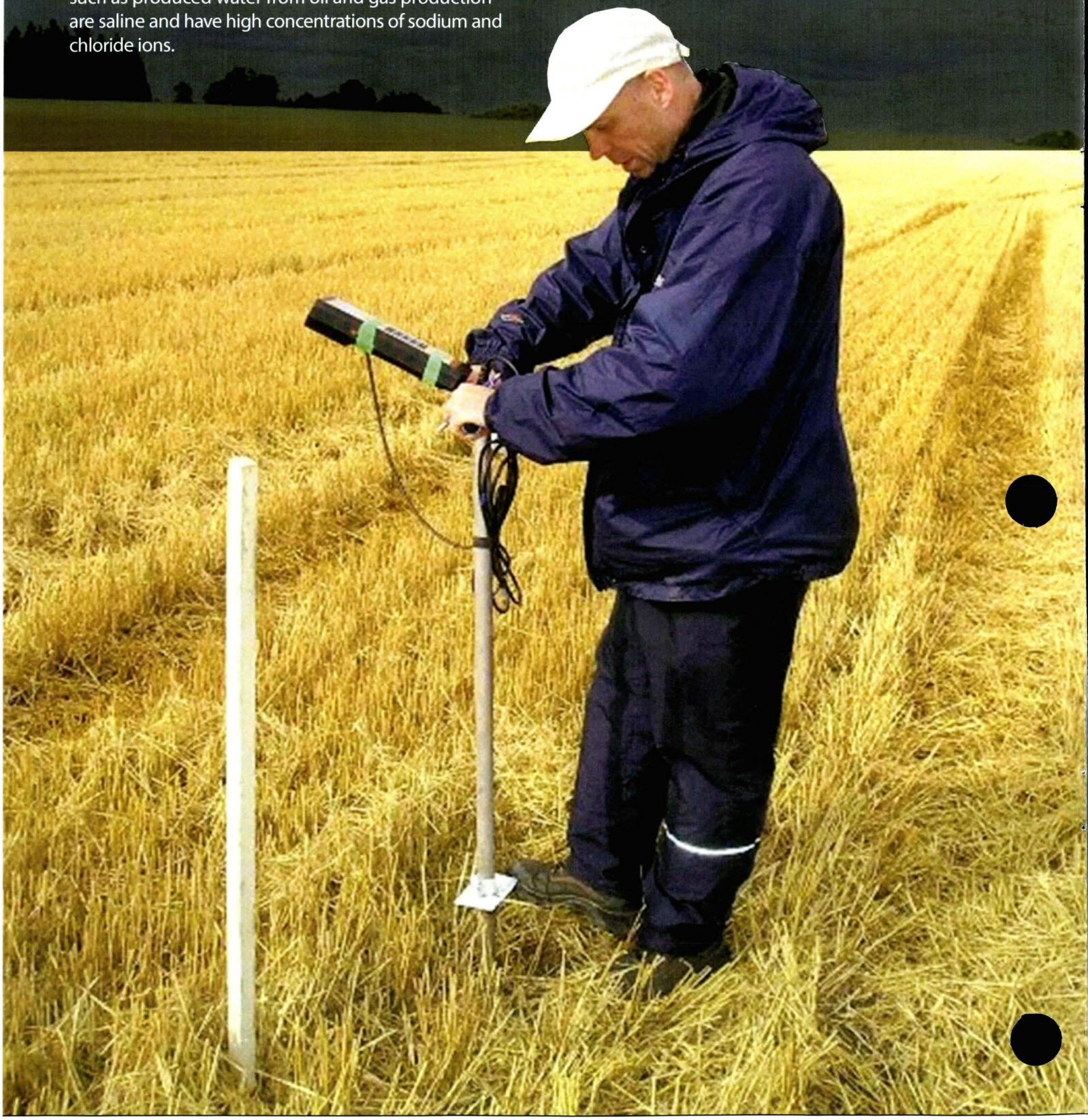
Bakken crude oil is much lighter than the "black gold" many people think of when they think of crude oil. Because of this, it is much more biodegradable.

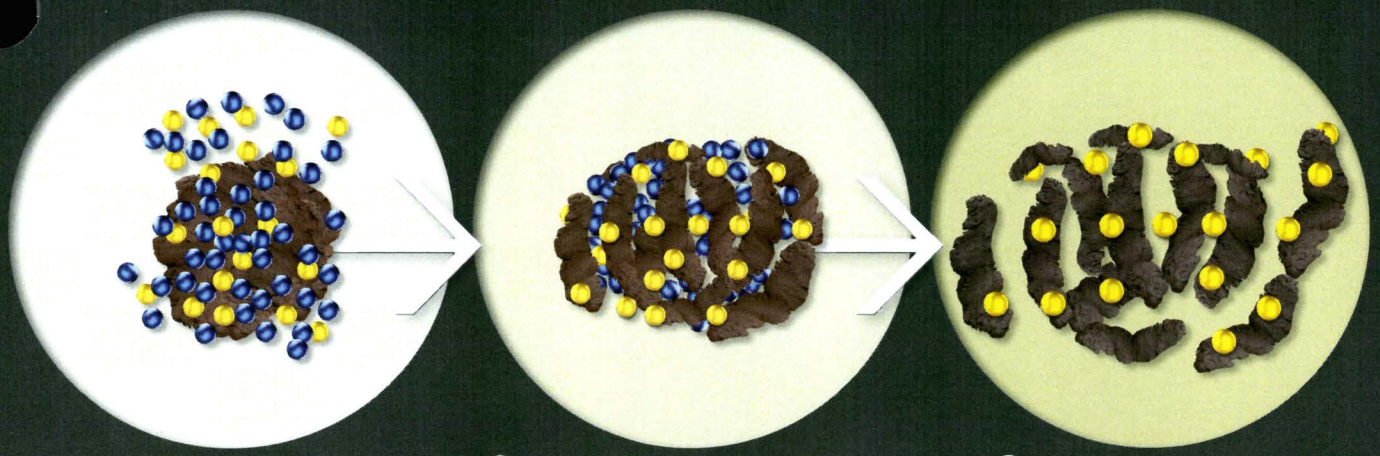
Once introduced to the soil, hydrocarbons can volatilize, adsorb to soil particles, dissolve into soil pore water, or remain as free product.



Saltwater Interaction with Soil

Soil salinity is quantified by measuring the electrical conductivity (EC) of soluble salts in solution. Brines such as produced water from oil and gas production are saline and have high concentrations of sodium and chloride ions.





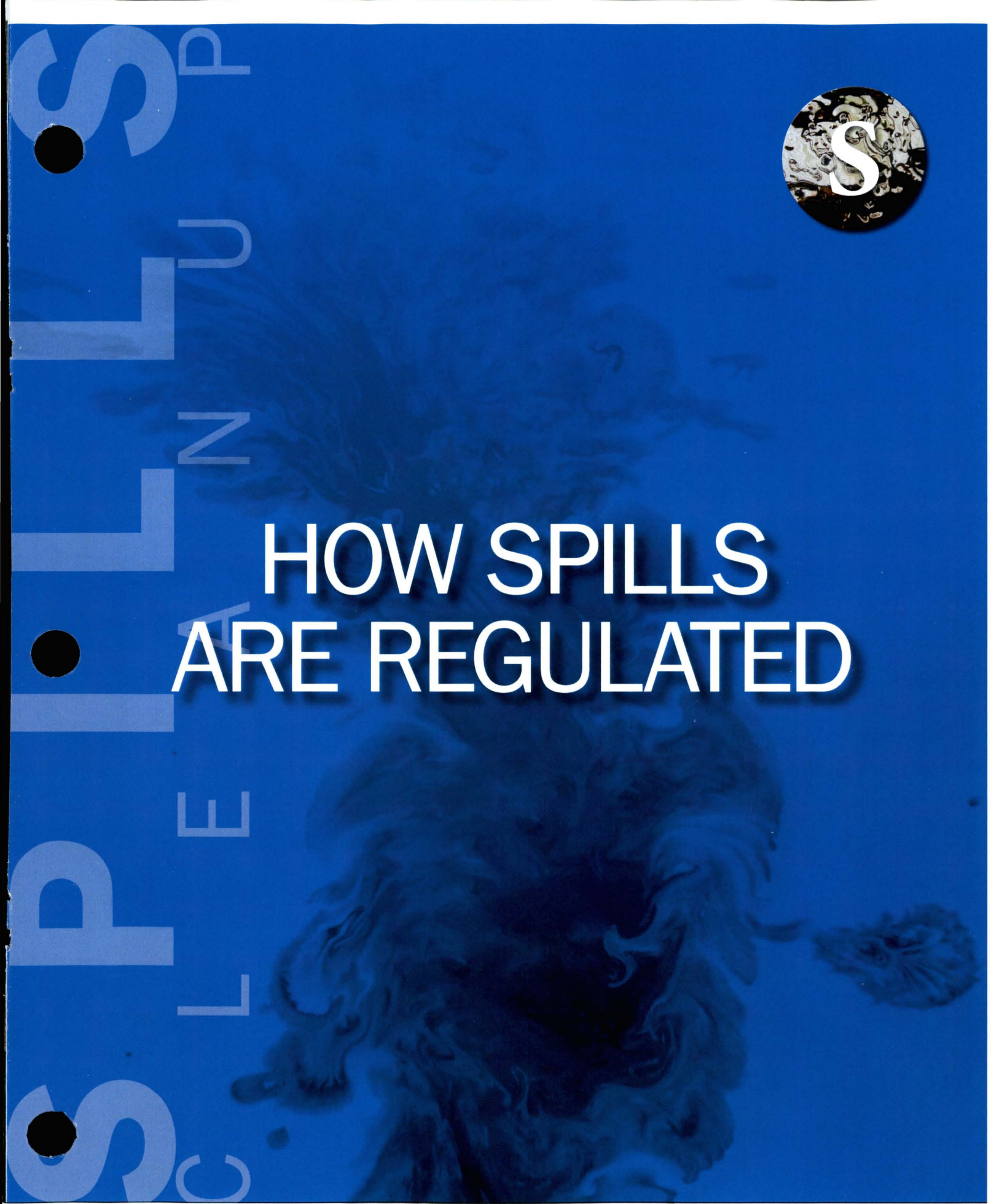
1. Introduction of brine (NaCl) **2.** Swelling of clay in the soil matrix **3.** Dispersion of clay particles

Sodium (Na) **Chloride (Cl)**

Salts can have a long-lasting effect on soils and vegetation. Salts impact soils by dissolving in the soil moisture and chemically interacting with clay in the soil matrix, swelling the clay particles and causing the clay particles to disperse. This results in soil that allows little water infiltration and is vulnerable to erosion. Salt-impacted soil has been successfully remediated employing various calcium-based soil amendments.

Salts affect vegetation by creating osmotic conditions that tend to pull water away from the plant roots and injure the plant. Salts also negatively impact soil microbe communities by lowering the osmotic potential of soil water and preventing cell growth.


USGS



HOW SPILLS ARE REGULATED

Summary of Spill and Reclamation Regulation

Any spill or other incident that could adversely affect human health or the environment must be immediately reported by the responsible party.

Observed spills and suspected leaks needing immediate attention may also be reported by the public.

Wastes listed below are RCRA (Resource Conservation and Recovery Act)-exempt wastes and are reported as oilfield-related incidences, examples; would include:

- Produced fluids such as crude oil, water, or oil–water emulsion before ownership transfer takes place (i.e., a release from the producer's lease, flow lines, or tank battery before being trucked off-site or going into crude transportation pipeline).
- Brine water from a commercial disposal facility.
- Condensate from gas lines or a gas plant before leaving the gas plant in the transportation pipeline.

All other releases should be reported to NDDH and are categorized as general environmental incidences.

The following site-specific characteristics play an important role in determining the remediation and reclamation plan as well as the ultimate cleanup goals:

- Quantity and type of product released
- Surficial geology
- Potential environmental and public health impacts
- Proximity to surface water and groundwater
- Site use and accessibility

Reporting Spills

North Dakota Department of Emergency Services: 24-hour hotline, (800) 472-2121

North Dakota Department of Health: (701) 328-5210 or (701) 328-5166

North Dakota Industrial Commission Department of Mineral Resource Oil and Gas Division: (701) 328-8020, www.dmr.nd.gov/oilgas/mvc/wincident/

NDDES Homeland Security State Radio

NORTH DAKOTA DEPARTMENT of HEALTH

NORTH DAKOTA OIL AND GAS DIVISION

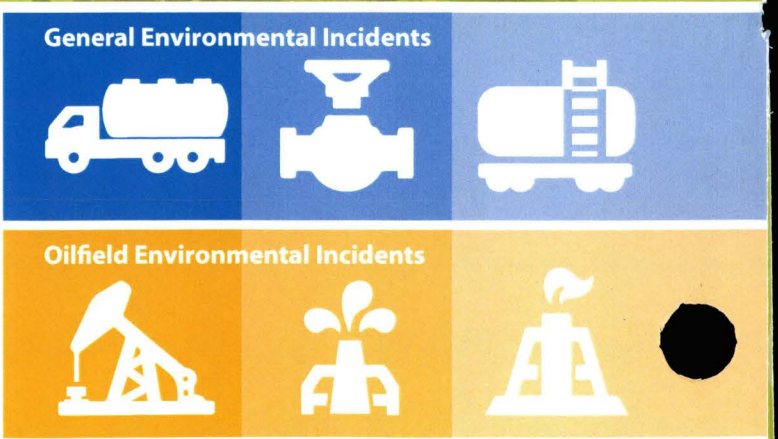
Regulatory Jurisdiction

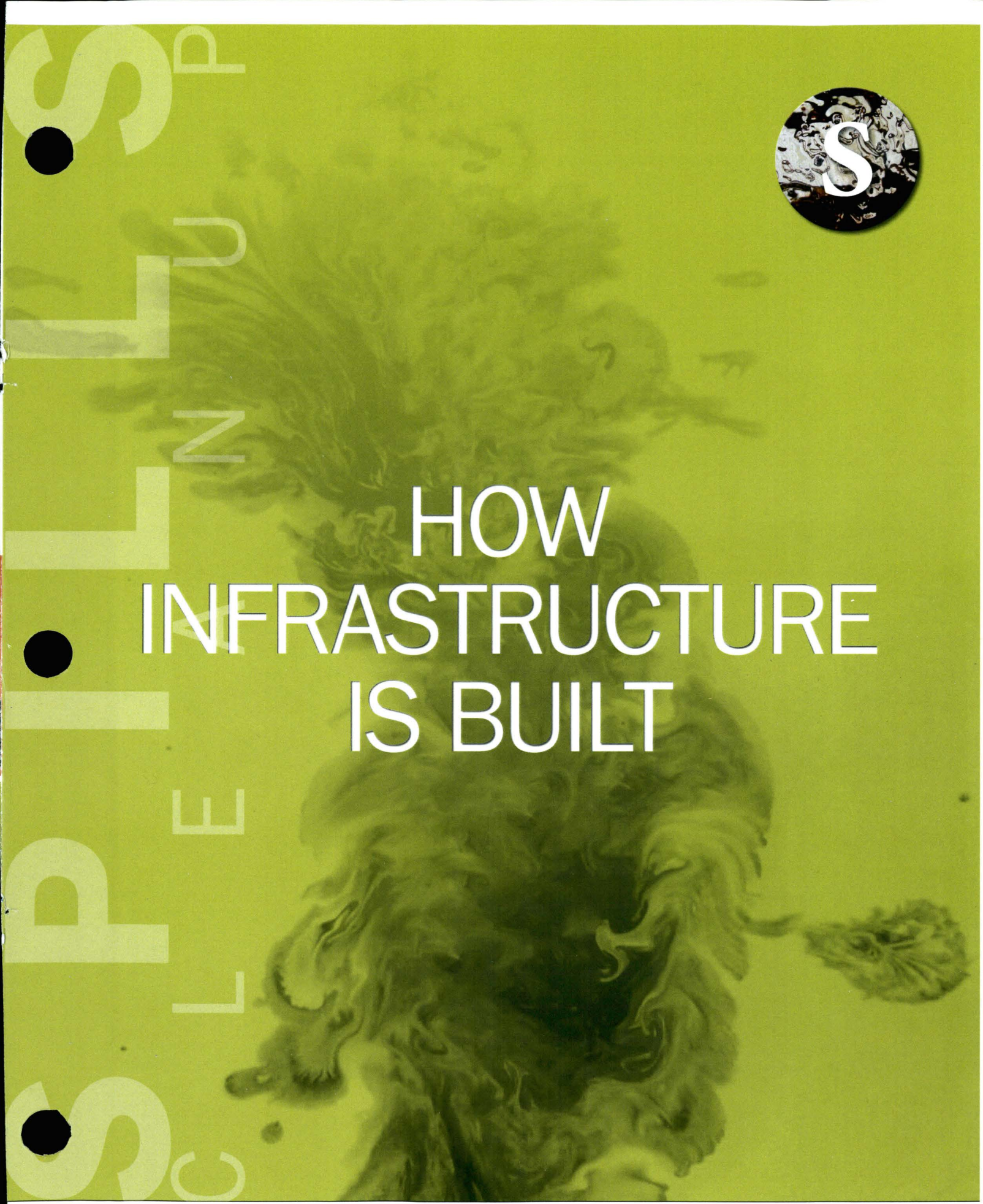
NDDH: spills and releases outside of the bermed oil and gas production pad. Oil and Gas: spills and releases on the bermed oil and gas production pad and, in some cases, gathering pipeline networks.

Public Access to Spill Information

Public access to reported spills is provided by NDDH at **www.ndhealth.gov/EHS/Spills/.**

NORTH DAKOTA DEPARTMENT of HEALTH





HOW INFRASTRUCTURE IS BUILT

Construction Methods
Designed to Minimize Spill Impact

TOPSOIL – Topsoil is removed from construction areas and is preserved in a stockpile to be replaced at the time of reclamation. When topsoil is stockpiled, it is typically reseeded to stabilize the pile from erosion and prevent weeds from growing. Other erosion controls may also be employed.

TANK BATTERY – Oil and gas production sites typically include several tanks used to temporarily store oil and produced water (brine) until they can be hauled away by trucks for either sale or disposal.

TANK BATTERY BERM – Tank batteries are constructed with several features to contain spills, including earthen or artificial berms, thick clay layers below the tank and, in some cases, liners under the tanks.

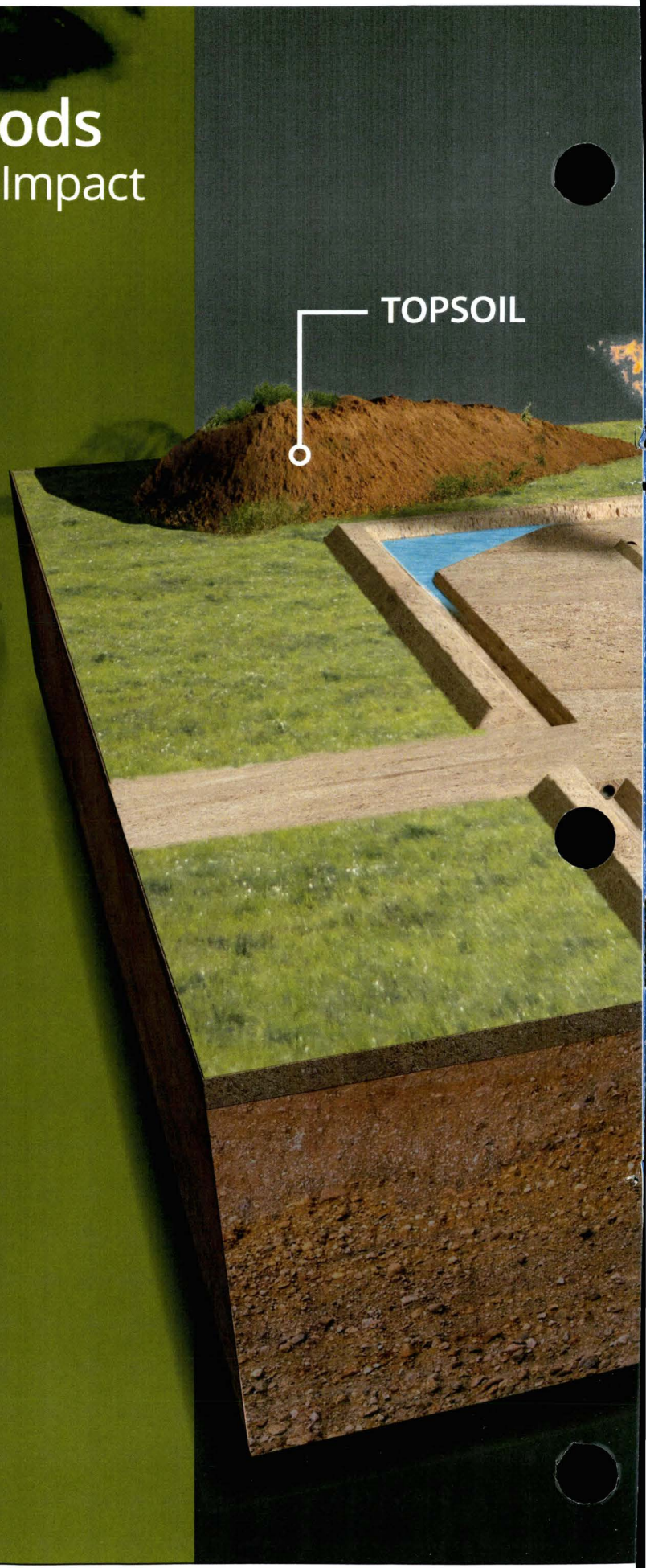
PERIMETER BERM – Construction of clay perimeter berms surrounding the entire location provides complete containment on-site.

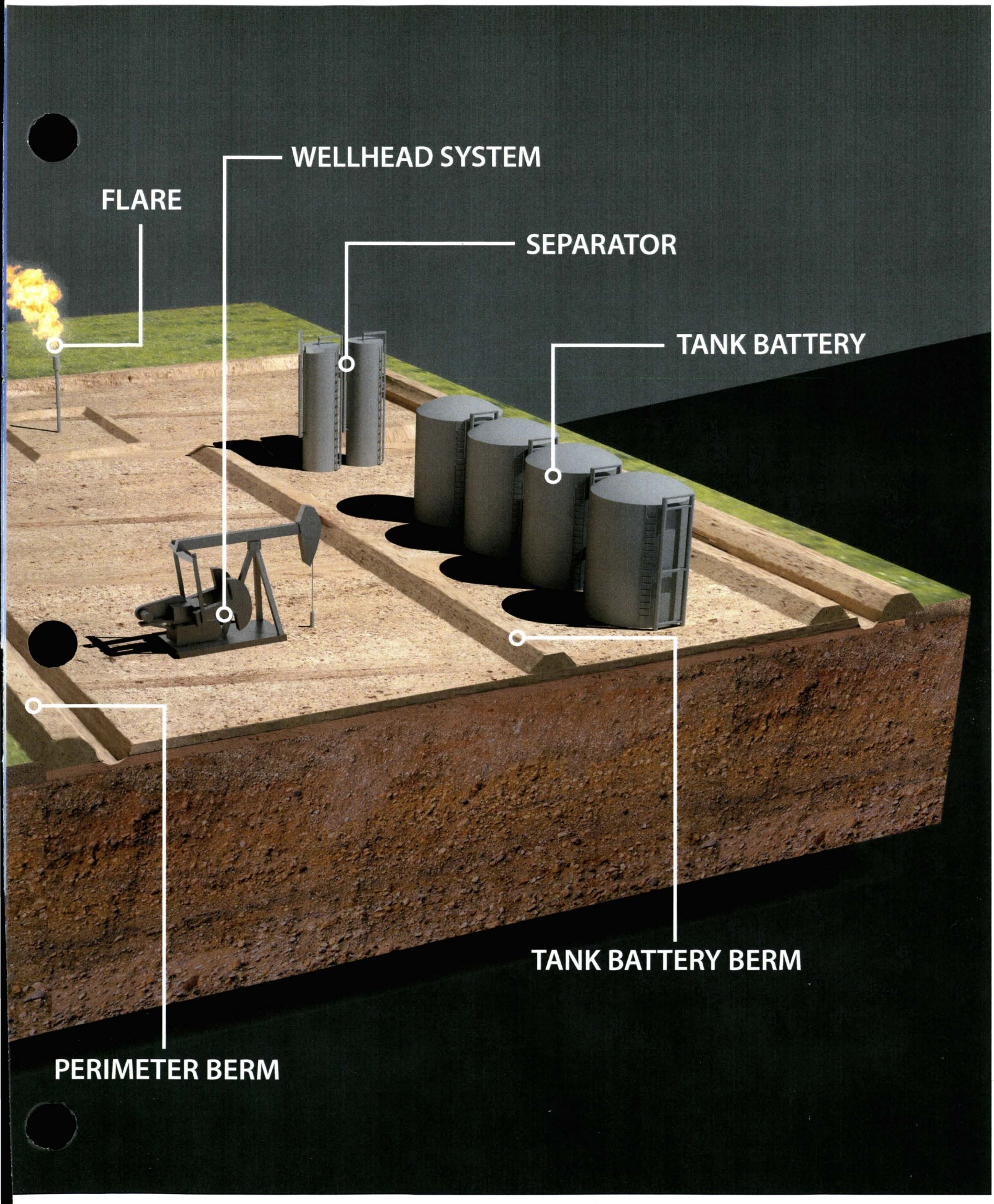
WELLHEAD SYSTEM – An interface is installed between the individual casing strings and the blowout preventer (BOP) stack. This interface is required for four main reasons:

- To contain pressure through the interface with the BOP stack.
- To allow casing strings to be suspended so that no weight is transferred to the drilling rig.
- To allow seals to be made on the outside of each casing string to seal off the individual annulus.
- To provide annulus access to each intermediate casing string and the production casing string.

FLARE – Flares are a necessary component to allow gas to be diverted during times of excess gas production or system upset. Flares are required even when the well is connected to a gas-gathering system.

SEPARATOR – The separator is a device that processes the initial production and separates the oil, gas, water, and sediment. After the separator, the oil and water are piped to on-site tanks while the gas is conveyed into a gas-gathering network.




WELLHEAD SYSTEM
FLARE
SEPARATOR
TANK BATTERY
TANK BATTERY BERM
PERIMETER BERM

Wellsite Construction Phases

Initial Pad Construction – Drilling Phase

Individual site evaluation (proximity to water bodies, drainages, wetlands) is conducted, and construction plans are adjusted to provide appropriate countermeasures (additional berms, ditch blocks, etc.) to protect those areas.

Preconstruction test holes provide information related to soil types and depth to groundwater. Construction practices are adjusted to meet the conditions present on location.

Compaction of the pad surface at time of initial construction reduces the chance of contaminant infiltration into the subsurface.

Construction of clay perimeter berms surrounding the entire location provides complete containment on-site.

Pads are constructed to promote drainage to the outer edges of the location, where they collect in ditches at the toe of the berms and are graded to flow to the containment areas.

Addition of clay-lined containment areas allows for more efficient recovery of fluids from a central location in the event of a spill.

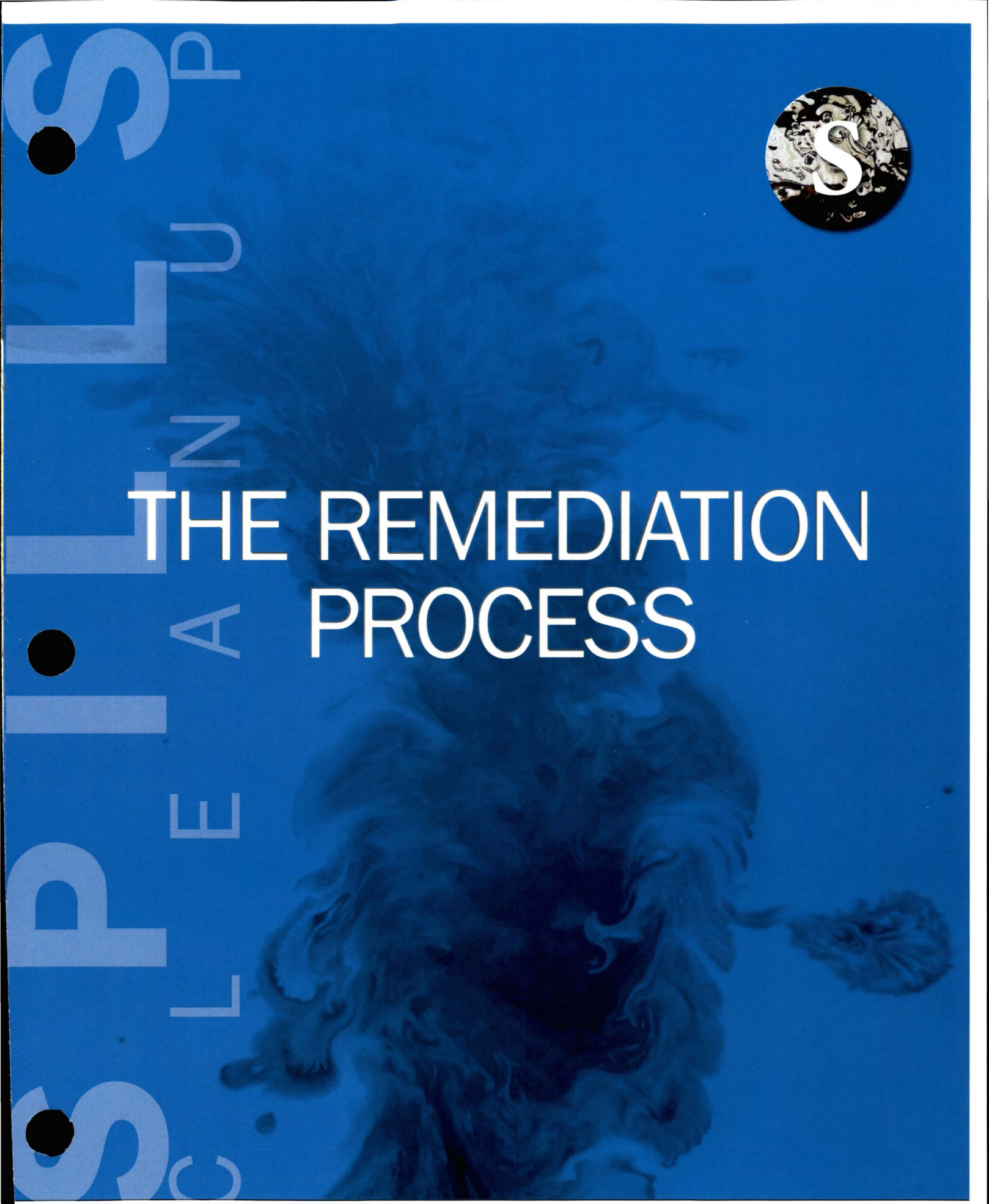
Interim Reclamation – Production Phase

Site-specific review of production layout and development of a reclamation-grading plan facilitate movement of fluids away from areas of heavy traffic.

Regrading and compaction of the pad surface (in accordance with plan) more efficiently move fluids to containment areas.

Redesign and construction of berms, ditches, and containment areas meet the needs of the reclaimed location.

Regrading and topsoiling of cut/fill areas assist in establishment of vegetation and provide stable cover to the exterior of berms, aiding in berm erosion prevention.



THE REMEDIATION PROCESS

Remediation
Cleanup of Spills

	In Situ Remediation
Pros	• Less overall disturbance to the site. • Less truck traffic. • Preserves native topsoil and subsoil which maintains native soil structure and ecological function.
Cons	• Remediation and reclamation process can take years to complete. • Requires qualified personnel to visit site periodically to collect and interpret samples.

Hydrocarbon Remediation Process

	In Situ Remediation	Excavation
Goal	Create an environment for natural bacteria to thrive and consume hydrocarbons as a food source, thus cleaning up the spill site.	Remove source of contamination.
Keys to Success	• Good contact between bacteria and the hydrocarbons • Adequate nutrients • Adequate oxygen • Adequate moisture • Appropriate pH • Proper soil temperature	

Step 1	– Collect and dispose of free product and standing liquid (if present).
Step 2	– Collect background information.
Step 3	– Collect soil samples from spill area and control area.
Step 4	– Install erosion control measures (if needed).
Step 5	– Apply amendments, and till site.
Step 6	– Till site periodically (adding additional amendments as necessary).
Step 7	– Collect soil samples periodically to assess remediation success.
Step 8	– Once remediation is complete, submit notice of completion.

Excavation
• Contamination source is removed quickly.
• Excavated subsoil and topsoil must be replaced with "harvested" soil from another site. • Cost to haul and dispose of hydrocarbon-impacted soil at a special waste landfill. • Potential long-term liability of impacted soil placed in a special waste landfill. • Added expense of replacing the removed soil with uncontaminated topsoil of similar textural class. • The potential introduction of weeds not previously observed at the site prior to the spill. • Creates an ecological island with distinctly different soil ecology and plant communities.

Brine Remediation Process

	In Situ Remediation	Excavation
Goal	Mobilize the salt ions (typically sodium and chloride) below the root zone where they can be recovered or where they will not impact sustained vegetative cover.	Remove source of contamination.
Keys to Success	• Sufficient application of calcium to replace sodium in the soil • Performance of remediation activities quickly after release	

Step 1	– Collect and dispose of liquid (if present).
Step 2	– Collect background information.
Step 3	– Collect soil samples from spill area and control area.
Step 4	– Install erosion control measures (if needed).
Step 5	– Apply amendments.
Step 6	– Collect soil samples periodically to assess remediation success.
Step 7	– Once remediation is complete, submit notice of completion.

SPILL REMEDIATION DECISION TREE

- Ensure safety of personnel and public.
- Isolate spill source.
- Gather spill information.
- Notify regulatory agency(ies).
- Collect liquid (if present).

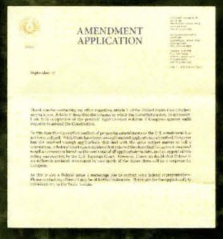
- Perform site investigation to delineate impacts and identify receptors.
- Develop remediation plan with input from regulatory agency and landowner.

Excavation

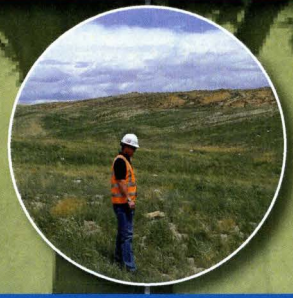
- Excavate impacted soil.
- Dispose of soil in approved landfill.
- Replace with appropriate fill.

Remediation

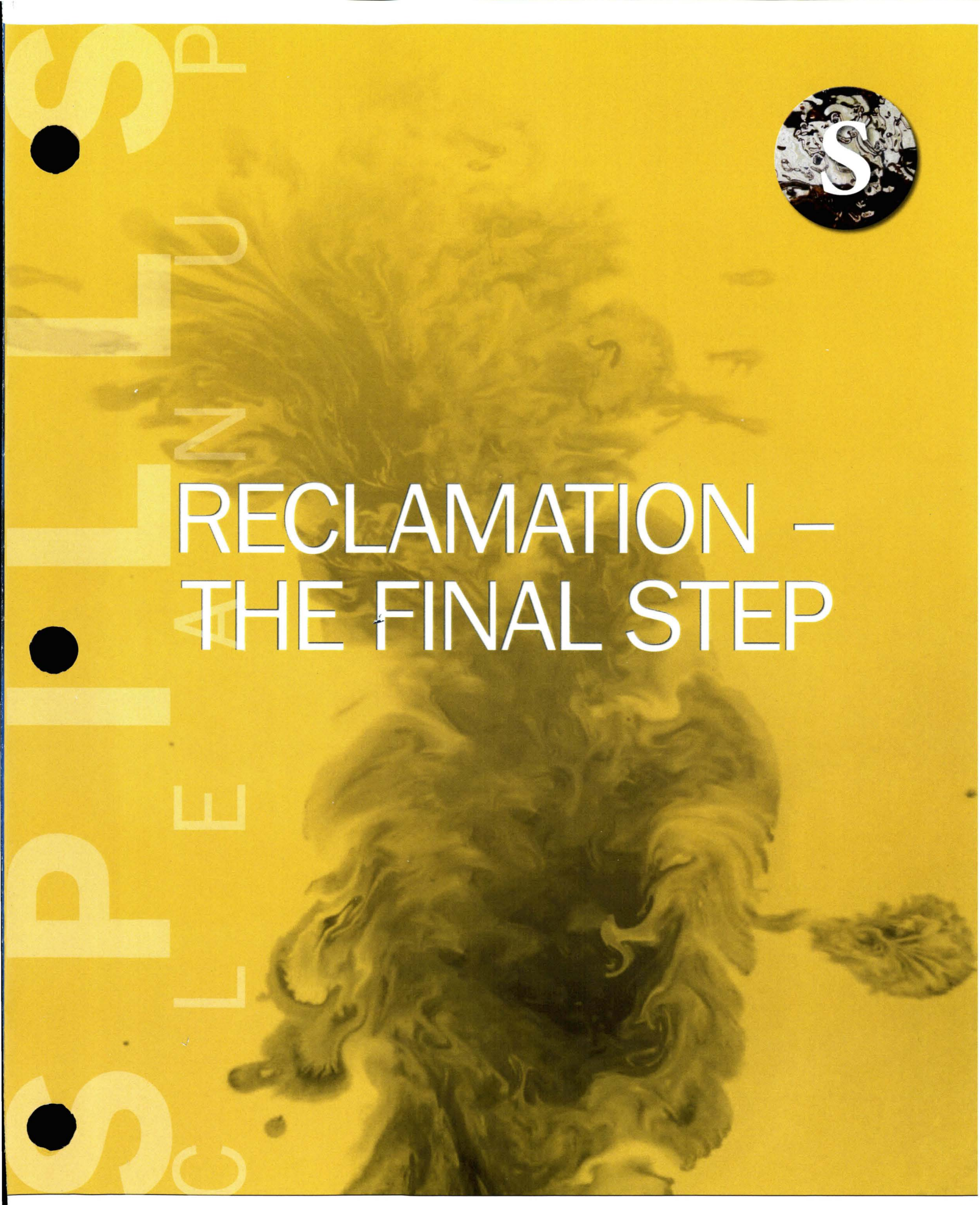
- Perform remediation.
- Monitor.



Submit "notice of completion" report to regulatory agency.



"No further action" required by regulatory agency.



RECLAMATION – THE FINAL STEP

Reclamation

Reclamation – Returning the Land to Productive Use

GOAL: restore a site disturbed during installation of infrastructure or contaminated by a brine or hydrocarbon spill to its predisturbance productivity.

Disturbed Areas

Step 1 – Perform a thorough preconstruction inventory to document site-specific information and ecosystem function.

Step 2 – Strip topsoil, and stockpile for eventual restoration.

Step 3 – Perform construction (i.e., pipeline).

Step 4 – Grade site to original slopes, and replace topsoil.

Step 5 – Prepare seedbed, and seed with appropriate seed mix at recommended depth.

Step 6 – Control weeds and erosion to allow seeding to become established.

Step 7 – Monitor reclamation area for up to 5 years, and take corrective action if necessary.

Step 8 – Obtain concurrence from regulatory agency and landowner that reclamation is complete and monitoring can stop.

Spill-Impacted Areas (as part of in situ remediation process)

Step 1 – Perform a thorough inventory of native soil and vegetative conditions to document site-specific information and ecosystem function.

Step 2 – Perform remediation as described earlier.

Step 3 – Control weeds and erosion to allow seeding to become established.

Step 4 – Monitor reclamation area for up to 5 years, and take corrective action if necessary.

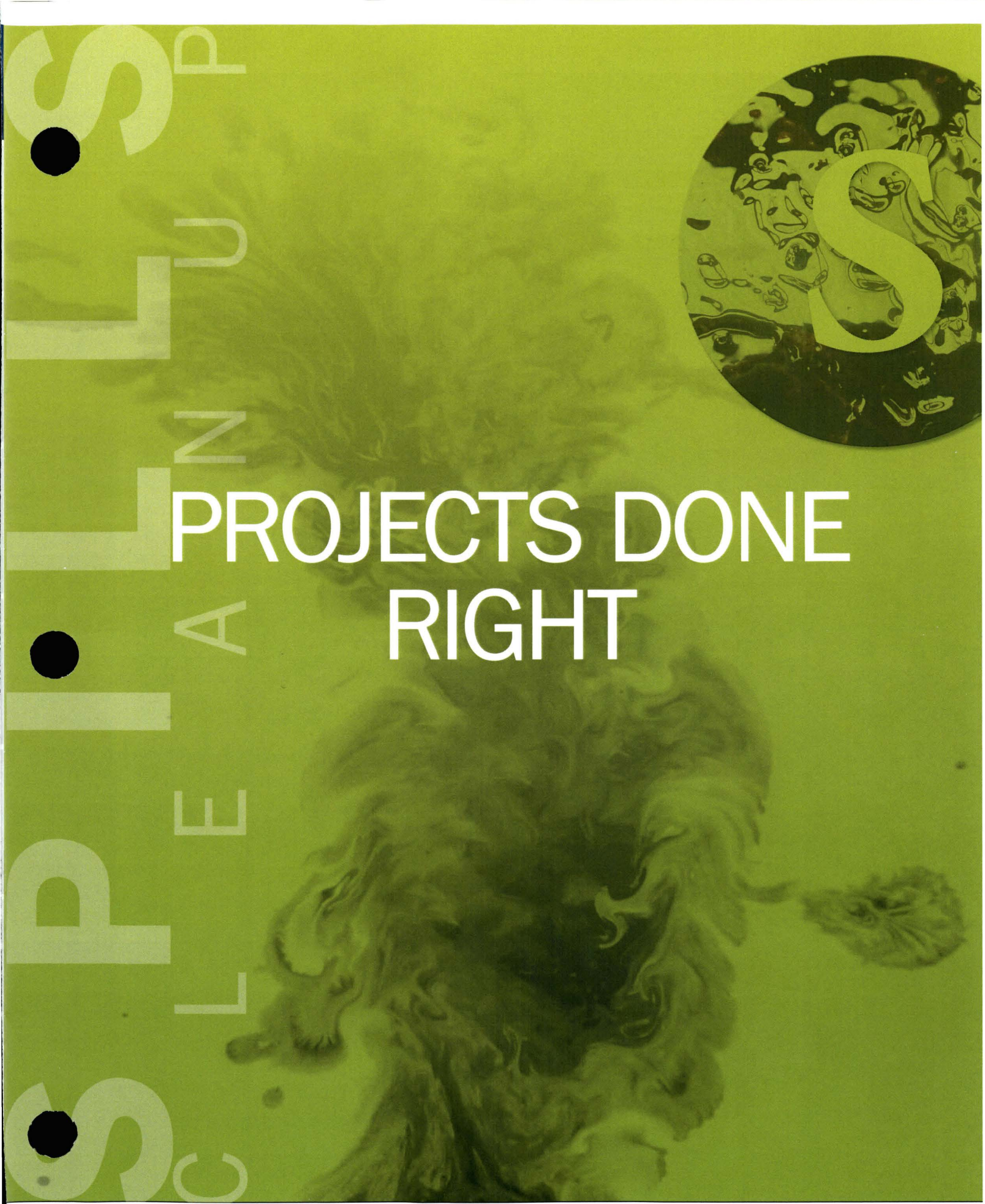
Step 5 – Obtain concurrence from regulatory agency and landowner that reclamation is complete and monitoring can stop.

Landowner Contacts

The North Dakota Industrial Commission Department of Natural Resources Division of Oil and Gas hosts an informational Web page related to gathering lines (www.dmr.nd.gov/oilgas/mvc/ndgathering/) which also includes an electronic form for submitting gathering line incidents (www.dmr.nd.gov/oilgas/mvc/NDGathering/GatheringIncident/CreateIncident).

The North Dakota Petroleum Council hosts an informational Web page at (www.ndoil.org/oil_can_2/easementinfocenter/).

The North Dakota Department of Agriculture provided mediation services to assist landowners in resolving reclamation nonperformance issues.


SIMPLE STEPS
PROJECTS DONE
RIGHT

Case Studies

Project Summary

Location: North Dakota

Land Use: Cropland

Spill Type: Pipeline release of brine

Native Soil Analysis: EC = 0.05 mS/cm, pH = 7.2

Initial Soil Analysis: EC = 17.9 mS/cm, pH = 6.2

Final Soil Analysis: EC < 1.5 mS/cm, pH = 6.9

Brine-impacted landscape (March 2000)

Remediation and reclamation complete (November 2007)

Project Summary

Location: Keene, North Dakota, area

Land Use: Rangeland

Spill Type: Pipeline release of brine

Native Soil Analysis: EC = 0.8 mS/cm, pH = 7.2

Initial Soil Analysis: EC = 24.5–27.0 mS/cm, pH = 7.1–7.2

Final Soil Analysis: EC < 1.0 mS/cm

Brine-impacted landscape (August 1997)

Application of amendments (November 1997)

Remediation and reclamation complete (September 2001)

Case Studies (continued)

Project Summary

Location: North Dakota

Land Use: Rangeland – natural drainage

Spill Type: Illegal discharge of brine

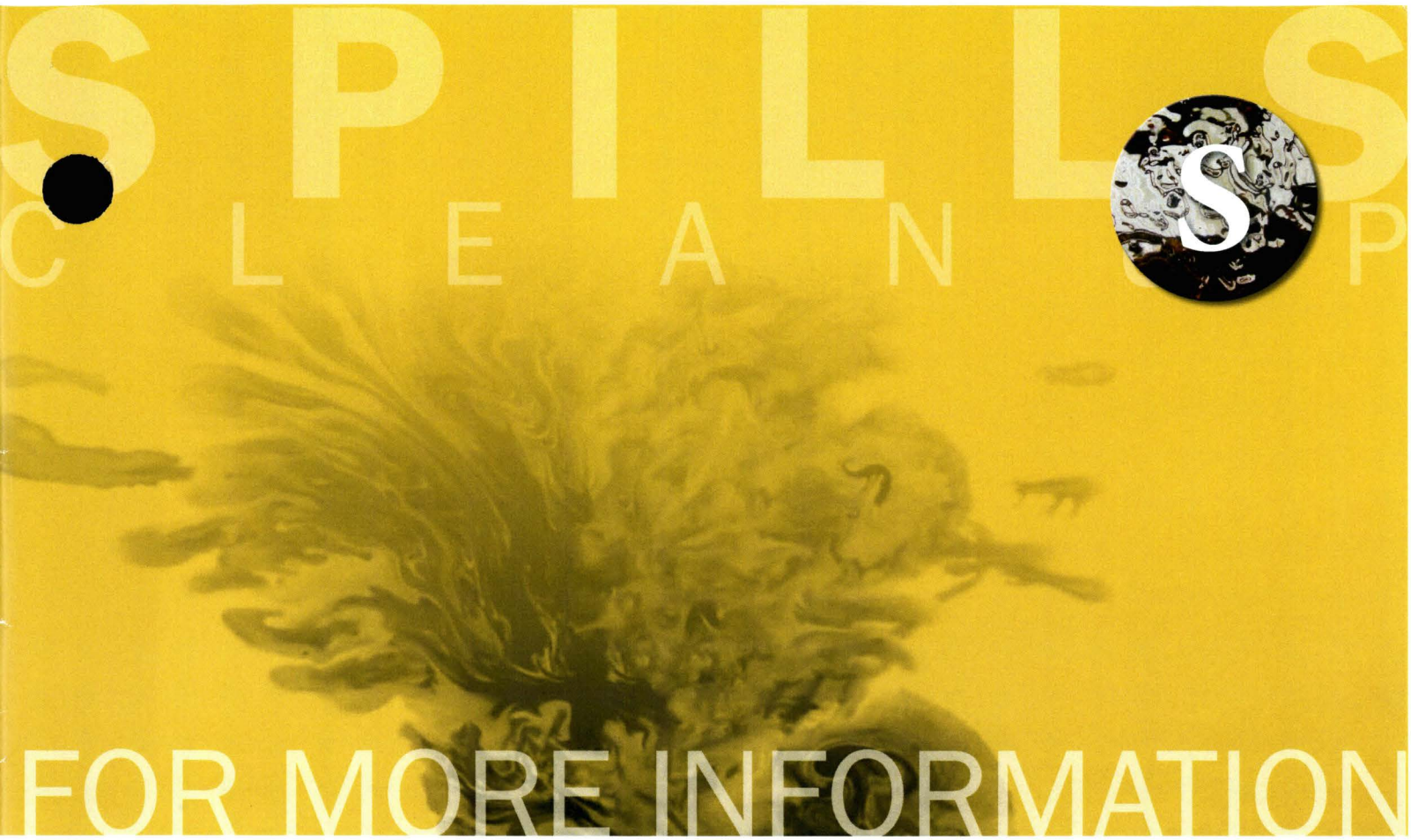
Native Soil Analysis: EC = 0.5 mS/cm

Initial Soil Analysis: EC = 37.9 mS/cm

Final Soil Analysis: EC = 1.9 mS/cm

Brine-impacted landscape (November 2011)

Remediation and reclamation complete (2014)



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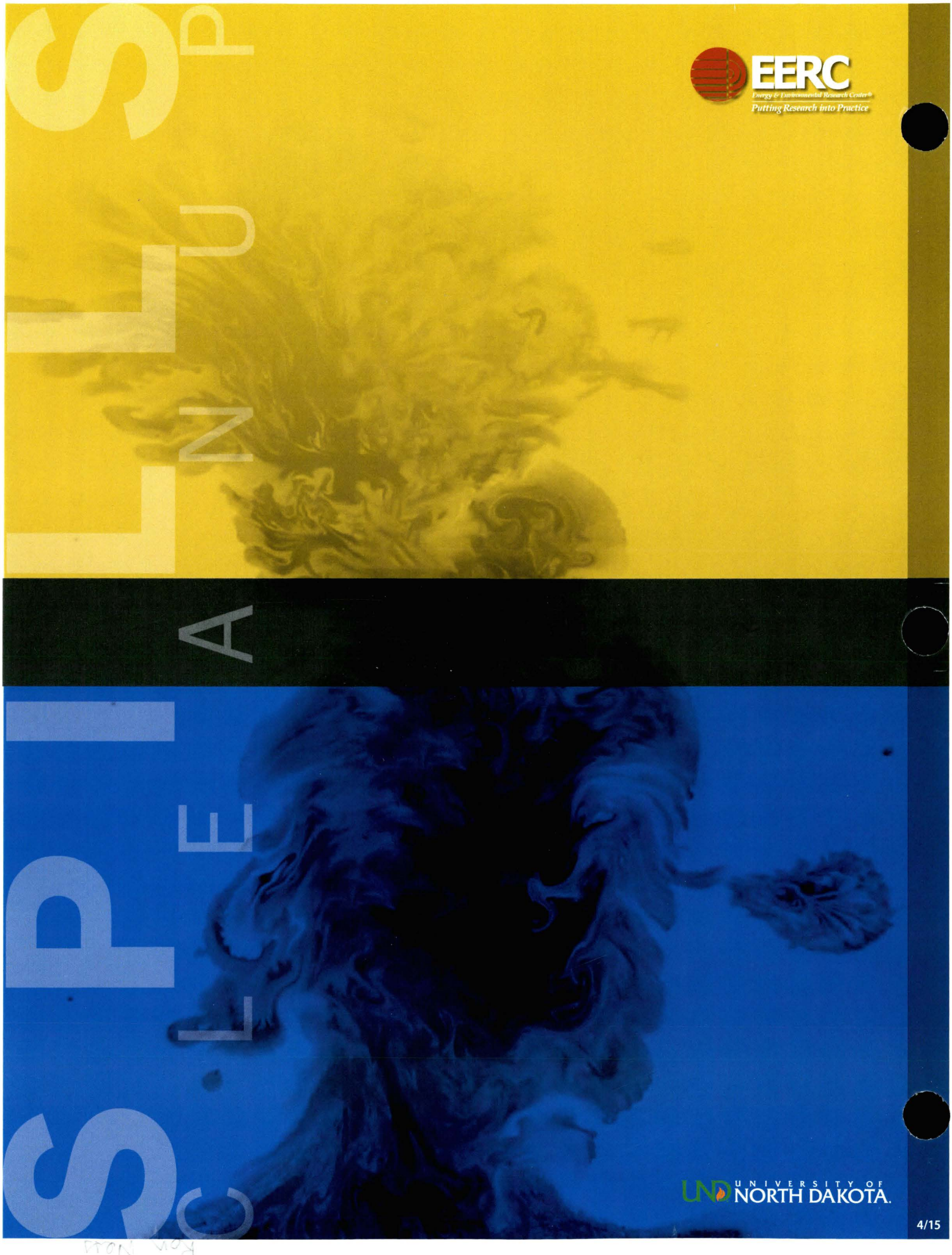
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4/15

1-12-17
HB 1151
#4
2PM

2017 HB 1151 – DO PASS TESTIMONY **Kathleen M Spilman, P.E.**

Chairman; Committee Members. My name is Kathleen Spilman. I am a registered professional engineer in the state with a BS degree in chemical engineering from UND-Grand Forks. And a proud native of North Dakota. I work for Keitu Engineers & Consultants, Inc. which is a North Dakota based regulatory affairs/environmental technical service firm located in Mandan. I have over 35 years of experience in the oil and gas industry with the vast majority here in North Dakota. Among our many assignments, we assist clients with developing emergency response plans, as well implementing those plans as needed. I have been involved with preparation of hundreds of oil spill prevention and response plans for well pads, terminals, pipelines and gathering system as well as refined fuel storage and other commercial and industrial oil storage facilities. I have also served as a private industry representative on the ND State Emergency Response Committee since 2007. I welcome the opportunity to testify in favor of a "DO PASS "recommendation on House Bill 1151 today.

There is a common misconception that there is one notification necessary when an unintended release occurs. Spill reporting rules are complex and overlapping. Each agency, as deemed necessary to protect their specific area of responsibility, develop and implement a rule suitable to their purpose. And we are here today to discuss the spill reporting requirement for the ND Department of Mineral Resources applicable to oil production well sites.

As an engineer, I tend to be very pragmatic. Does the effort expended justify the benefit? It is from this perspective that I question the value of the current requirement to report small spills to the ND Dept of Mineral Resources at or below 10 barrels in size. As we ask our state agencies to do more with less, we will need to forgo some data collection in order to focus available resources on events that demand their attention.

Let's review several pertinent facts which support a "DO PASS" vote:

FACT: Other existing spill reporting requirements will not be impacted. First and foremost, under ND Law, if any material is released that If a release flows beyond the site boundary and could pose a threat to human health or the environment, the respective Local Emergency Planning Committee i.e. County Emergency Manager must be contacted And isn't this really the desired standard of care? Government protecting its citizens and the environment? And would you not agree that 10 barrels of fluid, completely contained on a the leased well pad poses no threat, by definition, to people beyond the boundary of the lease pad?

FACT: The impact of such an event would remain regulated under a number of State and Federal laws including the ND Dept of Mineral Resources. NDAC 43-02-03-30.1 Leak and Spill Cleanup. Please allow me to paraphrase but key concepts include … discharged fluids must be properly removed … not allowed to flow over, pool, or rest on the surface of the land or infiltrate the soil. Discharged fluids must be properly removed … Operators and responsible parties must respond with appropriate resources to contain and clean up spills.

FACT: The US EPA's oil spill prevention control and countermeasure plan rules, mandated by the Federal Clean Water Act and typically referred to as the SPCC rules, also require reporting of spills and clean-up of releases. Their reporting thresholds are geared, again, to a specific threat. Essentially any amount that reaches surface water is reportable, and or when the amount of released oil is large enough that could be flushed to a surface water before it can be cleaned up. The corresponding rule under state law directs action to ND Department of Health NDAC 33-16-02.1-11 (4) "if a discharge causes or likely to cause pollution to waters of the state" must be reported immediately. The owner, operator, or person responsible for a spill or discharge must notify the department as soon as possible.

FACT: The US EPA's other rules – CERCLA / EPCRA or what most of us refer to as "Community Right To Know" regulations, establish thresholds quantities of chemicals to notify local and state officials for emergency planning and response. Of particular interest to us today is the RQ or reportable quantity threshold for any release by any means for benzene which is a component of crude oil. The RQ as established for spill reporting purposes is 10 pounds. In Keitu's experience, benzene composition of North Dakota Bakken crudes are less than other --- I'll refer to them as "legacy" North Dakota crudes oils. At 0.25 wt% benzene, a 42°API crude at 6.8 pounds per gallon would require 588 gallons or 14 barrels of crude oil to meet the reportable quality i.e. RQ threshold. Legacy crude oils will trigger CERCLA reporting at lower but still order of magnitude consistent levels. And this Federal rule requires not only reporting to the National Response Center run by the US Coast Guard, but State and local – specifically the LEPC or Emergency Manager – as well.

FACT: This change will not change separate and additional potential reporting under other existing Federal laws and policies such as the BLM, US Forest Service and the US Fish and Wildlife Service. There are also Federal spill reporting requirements specific to each mode of transportation – truck, rolling stock/rail, pipeline, marine, air - which exist, which would not be changed by this rule. The State of North Dakota also has additional and different reporting requirements for chemicals used in agriculture as well as different reporting requirements for hazardous wastes. Again not impacted by this proposed change but honestly not likely to be applicable for the event at an oil well pad.

FACT: With the changes in the ND Century Code in 2013 and 2015 establishing a centralized spill communication system hosted by the ND Department of Emergency Service, reports received by the National Response Center are funneled into this network as well – so local and state agency notification occurs with this mechanism. And in fact, 80 or more agencies are contacted via email. For every event. That message has to be read and assessed and designated for follow-up by the staff from the DMR. Somehow the story about the child crying "WOLF" comes to mind.

Looking at spill data for the last 12 months from the State's website:

FACT: In the last 12 months, a (920 + 285 + 297) = 1502 total incidents from all sources were reported. That over 4 a day. Oil production reports numbered 1205 or 80% of the total.

FACT: Of the 1205 oil field incidents, 920 or over 76% were contained on-site.

FACT: Of the 285 self-reported oil and gas production spill incidents not contained on the well pad; 240 (84%) were 10 barrels or less. However, all of these incidents would remain reportable to the ND DMR under the proposed rule change.

FACT: Of the 920 "contained" incidents contained on the site, 298 of the incidents reported volumes **above 10 barrels** or did not report a volume. Even including releases of fresh water, incidents that were releases to air, or when a volume was not included, this number is 32% of the total. Under the proposed rule, 622 or 68% of the events would likely not have been a reportable event.

So rest assured your support of this regulatory relief will NOT intrude on the required regulatory notices when people or the environment are at risk. As state agencies are being asked to cut back, we are all going to have to give up something. There is a real cost to keeping everyone in the information loop, especially when the considering the impact to the multitude of county and state employees process multitude of these notices. Some data gathering effort can and should be sacrificed to allow our regulators to devote their time available to deal with real spill issues.

I ask for "DO PASS" vote on this bill.

I would be happy to answer any questions you may have.

HB 1151 Hearing on 1/12/2017

Testimony of Paul Sorum

1-12-17
#5
HB 1151
2PM

I work in the oil industry and have insights into the ramifications of proposed House Bill 1151 should it pass into law. House Bill 1151 seeks to limit the reporting requirement for oil and gas related spills to only spills that are more than ten barrels by volume by adding the following text to Section 38-08-04 of the N.D.C.C. (emphasis added):

> 2. The commission may not require any person controlling or operating any well, or a facility that handles fluids used in the production of gas or oil, to report to the commission any spill or release of fluid confined to the oil well pad, production facility, or a production - related handling facility if the spill or release of fluid contains ten or fewer barrels of fluid.

Jurisdiction is not Limited

At first blush this bill seems to only be talking about well pad sites. However, the additional text underlined above includes production facilities or production-related handling facility without defining a production-related facility. Without a clear definition, any tank farm, transfer station, pipeline riser, treatment facility, or pipeline might arguably be included within this vaguely defined jurisdiction.

Hazards of Spills are not Limited to Crude Oil

The proposed HB 1151 does not limit spills to oil spills. It simply includes all "fluids". Produced water, for example, has ten times the salt content of sea water and is very difficult to contain and clean up. Also, there are other fluids such as condensate which look like water, but is extremely volatile and hazardous to people. There are also other petro-chemicals which contain ammonia, chlorine, and fluids which contain highly poisonous H2S gas. These spills should definitely be reported at any volume because of the hazardous danger of these petro chemicals. Also, many types of crude oil contain small amounts of all the toxic chemicals listed above.

Ten is Not a Small Number

Ten barrels may sounds like a small amount of fluid. I was involved in the clean up of a 6 barrel oil spill in eastern Montana. The total cost of the clean up was over $40,000. If the fluid spilled was salt water, the cost would have been at least three times higher. Even spills of ten barrels (420 gallons) or less pose significant clean up challenges and inflict considerable

HB 1151 Hearing on 1/12/2017

Testimony of Paul Sorum

HB 1151 Presents Due Process Problems

Today, in North Dakota, spills of any amount must be reported. The language of the proposed bill seems clear that the minimum amount should be raise to any spill over ten barrels. However, there are many (if not most) situations where the amount of fluid spilled is unclear at best. More importantly, the area of land and water affected by a ten barrel spill varies greatly.

Measurement

Once a spill has occurred, the volume of the spill is impossible to measure.

No Incentive to Report: Volume v. Number of Spills

What about the case that a site had an 8 barrel spill on one side of a tank and an 8 barrel spill on the other side of a tank. Is this one 16 barrel spill or two 8 barrel spills? No employee of an oil or gas company has an incentive to report a 16 barrel spill when they can interpret this situation to be two smaller spills.

Dilution

What about the case where 9 barrels of salt water is spilled and shortly there after there is a hard rain which washes the salt water across adjacent property and into a public drain such as a highway ditch? How many barrels of salt water were spilled in this case? How is the owner of the neighboring property compensated for damage to his property when there is no report of a spill? How far has the contamination spread when no one is aware of the spill, etc?

Unseen Spills

Often, spills happen in partially unseen ways. A leak in a pit liner is common. A tank can overflow and cause a small number of less than 10 barrels to flow off of a pit liner that does not have a proper berm. But, such a spill can also slowly leak through a small hole in the pit liner over time causing excessive unseen damage. Is this spill ten barrels or less because the leak is happening over a longer period of time?

Corroded Equipment

What about the case where corroded equipment (a tank and pipe) leaks 3 barrels a day. If the leak is not discovered until a month has passed, is this one 3 barrel spill each day? Or is this a 90 barrel spill? Remember there is no incentive under HB 1151 to report a spill which can not be accurately measured to be over 10 barrels.

Cold Weather

When the ground is frozen, a small spill can cover a much larger area of ground since it cannot penetrate the soil possibly doing as much damage as a 50 or 100 barrel spill.

HB 1151 Is Politically Unwise and may Risk Public Safety

The recent NODAPL protestors have drawn national attention to the risk of spills in North Dakota's oil and gas industry. Sometimes these protests have been violent. HB 1151intentionally throws gas on the flames of protestors and the environmentalists who support them by saying to the general public, "Let's go ahead and have way more oil spills in North Dakota." This is unwise and risks more violent protests in our great state. Further, it makes for a very bad press nation-wide.

Conclusion

All of us in North Dakota (conservatives, independents, and liberals), want a clean environment. Most of us in the state also believe this can be done while facilitating a successful oil and gas industry.

This bill will NOT achieve these goals but serves to put both the environment and the oil and gas industry at risk for no reason or benefit to the people of North Dakota.

SALTED LANDS COUNCIL

HB 1151
1-12-17
#6
2PM

Legislators, thank you for your service and!
Comments on House Bill 1255 January 12, 2017

My name is Fintan Dooley.

My phone number is 701 212-1000
My email address is findooley@gmail.com.
My law office address is
218 N. 4th St.
Bismarck, ND 58501

The insights that motivate me to speak today derive from my time on family farms, friends' ranches, and work with rangeland researchers at the USDA facility south of Mandan. I have a degree in botany in chemistry. I wanted to be a rancher but the Vietnam War got in my way.

This project is my farm, my ranch. I've been fascinated by mining and the oil industry since I was a third grader.

My first well visit was at Freiburg. I've studied the world's oil industry during my travels in North America, Nigeria and Kazakhstan.

Prior to my service in the US Army as a paratrooper and Syrian Arabic linguist, I worked on two drilling operations in Wyoming and two in Louisiana. All of the wells were successful from a production point of view. Three of them were disasters from a human and environmental point of view.

The first well had poorly designed and located pit which overflowed on the occasion of the only rain near Bill, Wyoming during the summer of 1969. All of my floor companions were knocked off the floor by the breakout tongs and one probably died after we got him to the hospital.

My second Wyoming well blew out but did not burst into flames..

My first Louisiana well was an old swamp rig. The coastal estuary of Louisiana has been shredded by the oil industry and in between those cuts to allow access of drilling rigs are unmarked dumps of chemical releases. I saw the progress of the increasing disaster from ground level by my work on a shrimp boat boats and from above by helicopter.

The fourth well was in the Gulf of Mexico, a Sinclair rig. It was new and standing in 600 feet of water. The fish and the fisherman loved it. It created an artificial reef.

So what are the impressions I'd like you to take from my set of eyes? What we can learn from this is that the oil enterprisers go to remote areas and it's only with passage of time after disasters that regulators understand the magnitude of the damage done.

We can wish, but it can never happen that the North Dakota oil industry's operations will be as closely scrutinized and their cleanups (reclamations) will be as effective as reclamations accomplished by the North Dakota coal industry. As Republicans, we should never let Art link's the spoken without the name Robert Stoup. He was the Hazen, North Dakota Republican senator, the head of the Senate that enabled Art link

Why is not the oil industry as exemplary as the coal industry? Because it is operations are relatively small and always remote. It is staffed by constantly changing workers. Its operations involve multiple phases. I pray that I may eat my words and praised the oil industry beyond the praise I have for the coal industry.

From you, we need an increasing attention to the disaster shown in these photos. I now invite you to tour with us.

To quote North Dakota Health Department's David Glatt, who has visited disaster sites bills what is shown here is widespread in the in the conventional oil field . Adopting this law would and indeed accelerate the damaging and destruction of farm and ranch lands that is already occurring in the unconventional Bakken development.

If the 10 barrel exemption proposed in this bill is allowed that you young legislators will live to rue the day you pass this bill. After you die you will face the scorn of Saint Robert Stroup and if Democrats are allowed in heaven, Art link.

We have not even begun to reclaim damage done by the oil industry. The spills are accelerating. They are not recorded. To pass this bill will encourage further no reporting.

The 10 barrel exception will place low-level staff in vulnerable positions. To report a 10 barrel spill will expose the workers to questions , "How do you know it was 10 barrels???" The pressure to fudge, to prevaricate to lie will be applied. I ask you to hold hearings on this bill. Invite those who know because their land is being contaminated by spills.

Respectfully submitted,

Fintan

Fintan Dooley
Serving the ND LAWS Project
Coordinator of Salted Lands, an educational nonprofit organized under North Dakota Law

HB 1151
#1
2PM
Fintan Dooley

January 12, 2017

North Dakota, the State of Spills

A photo and bulleted summary of damaged private and public Property

Prepared for

ND LAWS – North Dakota Land, Air, and Water Stewards

Under the auspices of **www.saltedlands.org**

Founder, Donny Nelson

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Coordinator, Fintan Dooley

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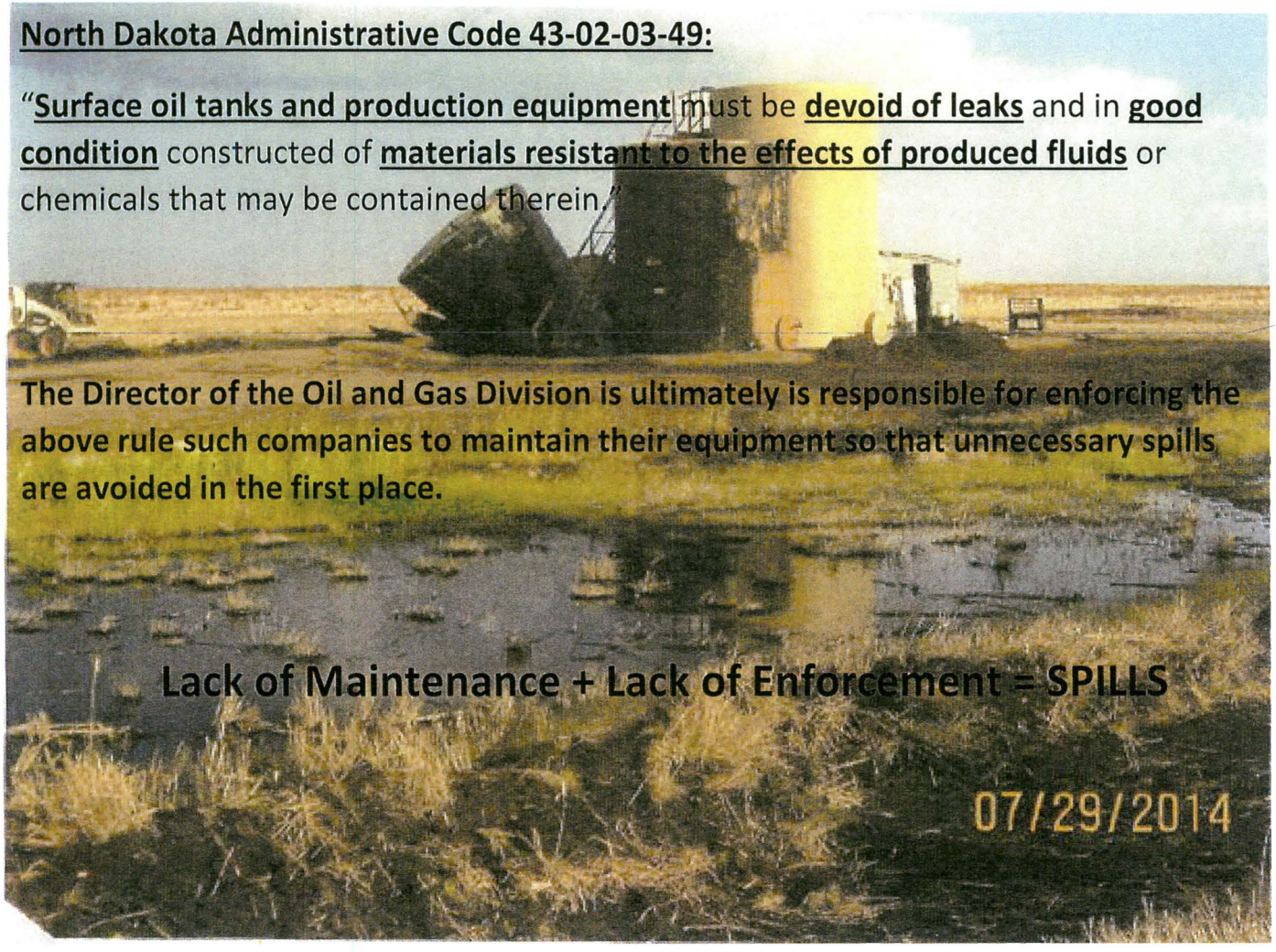
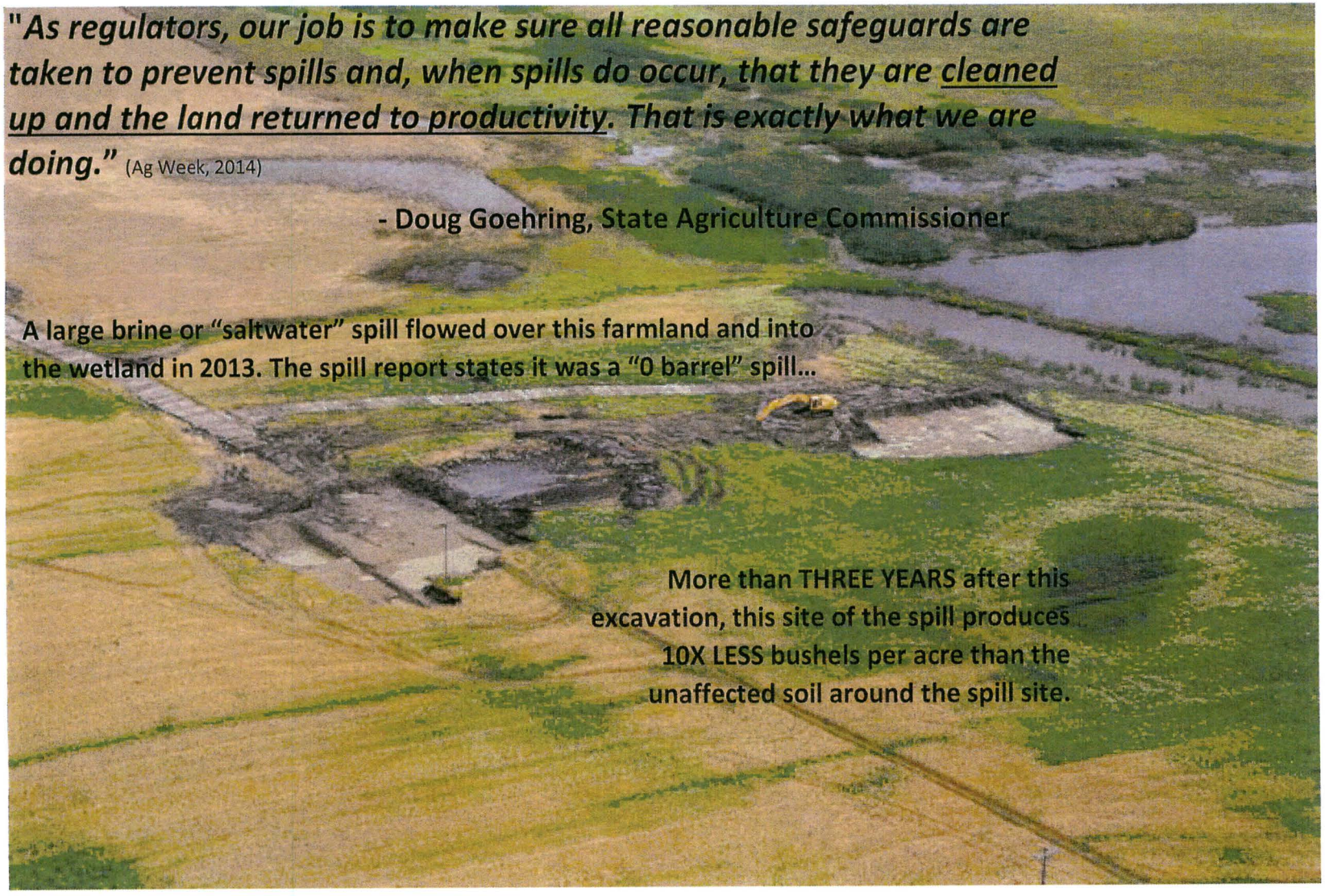
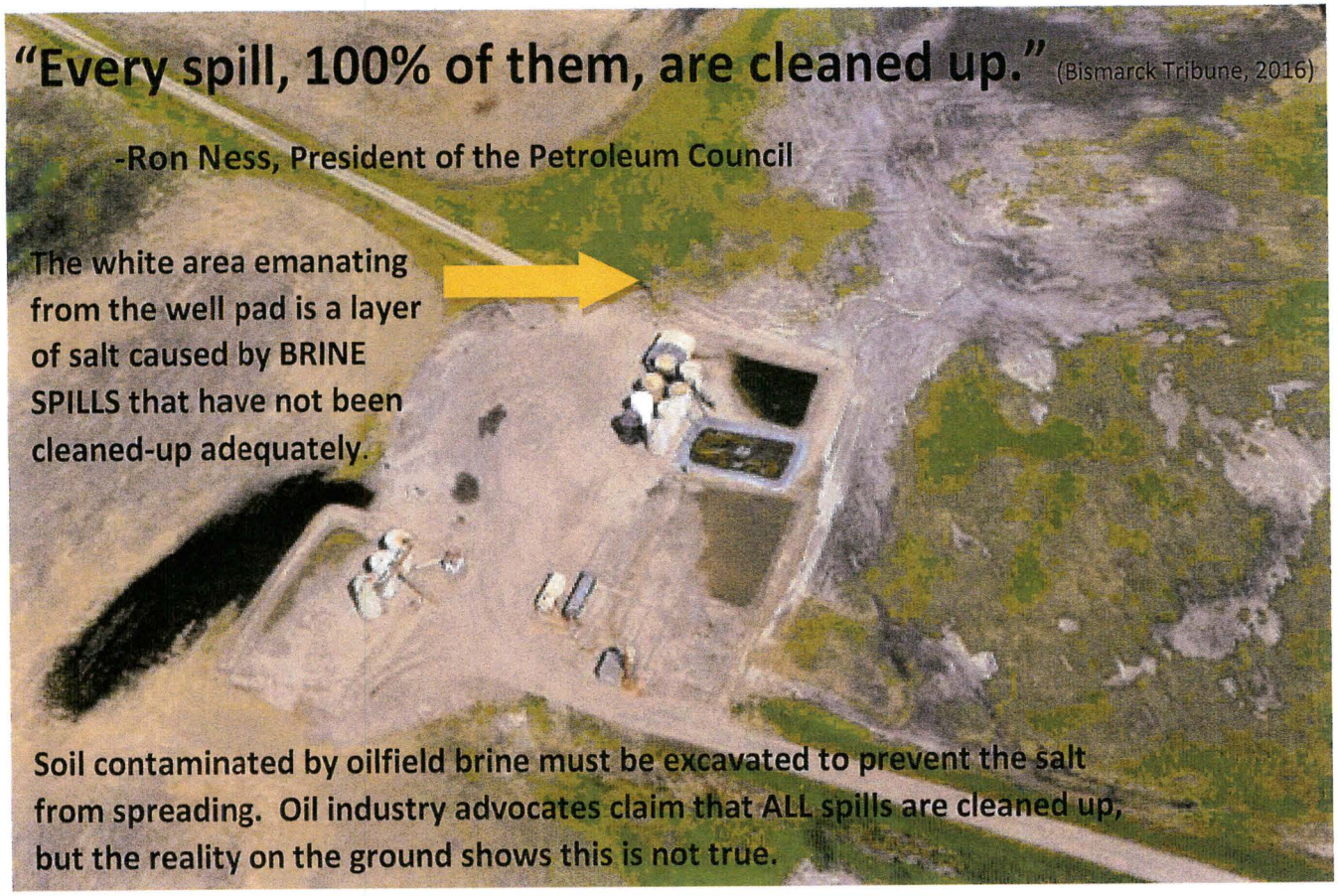
701-212-1000


"Every spill – 100 % of them – are cleaned up" (Bismarck Tribune, 2016)
-Ron Ness, President of the Petroleum Council
This 2016 photo shows soil damaged from a spill 5 years ago. Brine flowed atop at least 25 acres of soil. The spill was reported at 300 barrels, though dimensions of the damaged soil indicate the spill was tens of THOUSANDS of BARRELS.
Location: W. Section 5, T 161 R 82



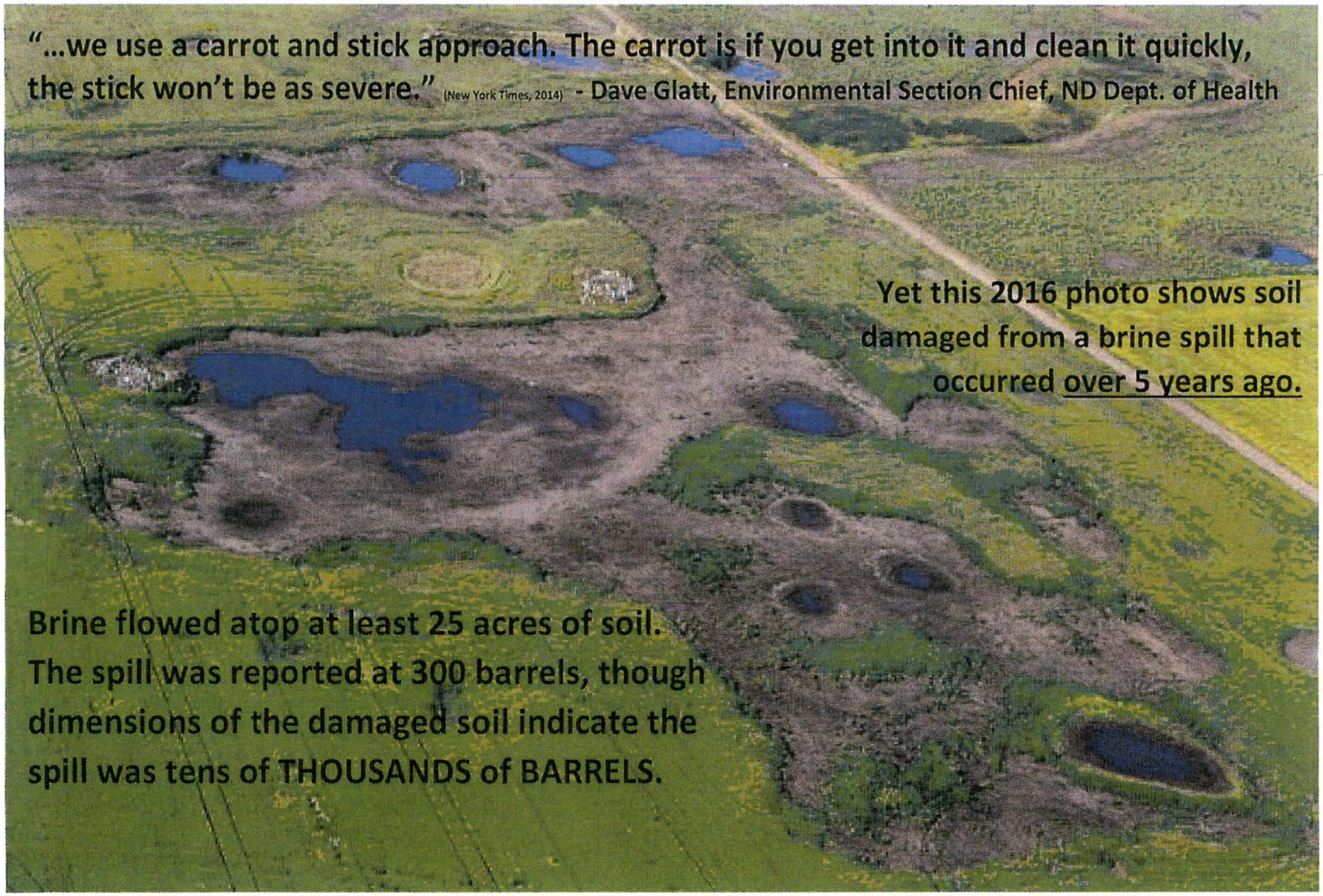
Comment: Location: NWNE Sect 29 T 163 R 82


"As regulators, our job is to make sure all reasonable safeguards are taken to prevent spills and, when spills do occur, that they are cleaned up and the land returned to productivity. That is exactly what we are doing." (Ag Week, 2014)
- Doug Goehring, State Agriculture Commissioner
A large brine or "saltwater" spill flowed over this farmland and into the wetland in 2013. The spill report states it was a "0 barrel" spill...
More than THREE YEARS after this excavation, this site of the spill produces 10X LESS bushels per acre than the unaffected soil around the spill site.


"Every spill, 100% of them, are cleaned up." (Bismarck Tribune, 2016)
-Ron Ness, President of the Petroleum Council
The white area emanating from the well pad is a layer of salt caused by BRINE SPILLS that have not been cleaned-up adequately.
Soil contaminated by oilfield brine must be excavated to prevent the salt from spreading. Oil industry advocates claim that ALL spills are cleaned up, but the reality on the ground shows this is not true.

Comment 2: Location: NE Section 31 T 162 R 81

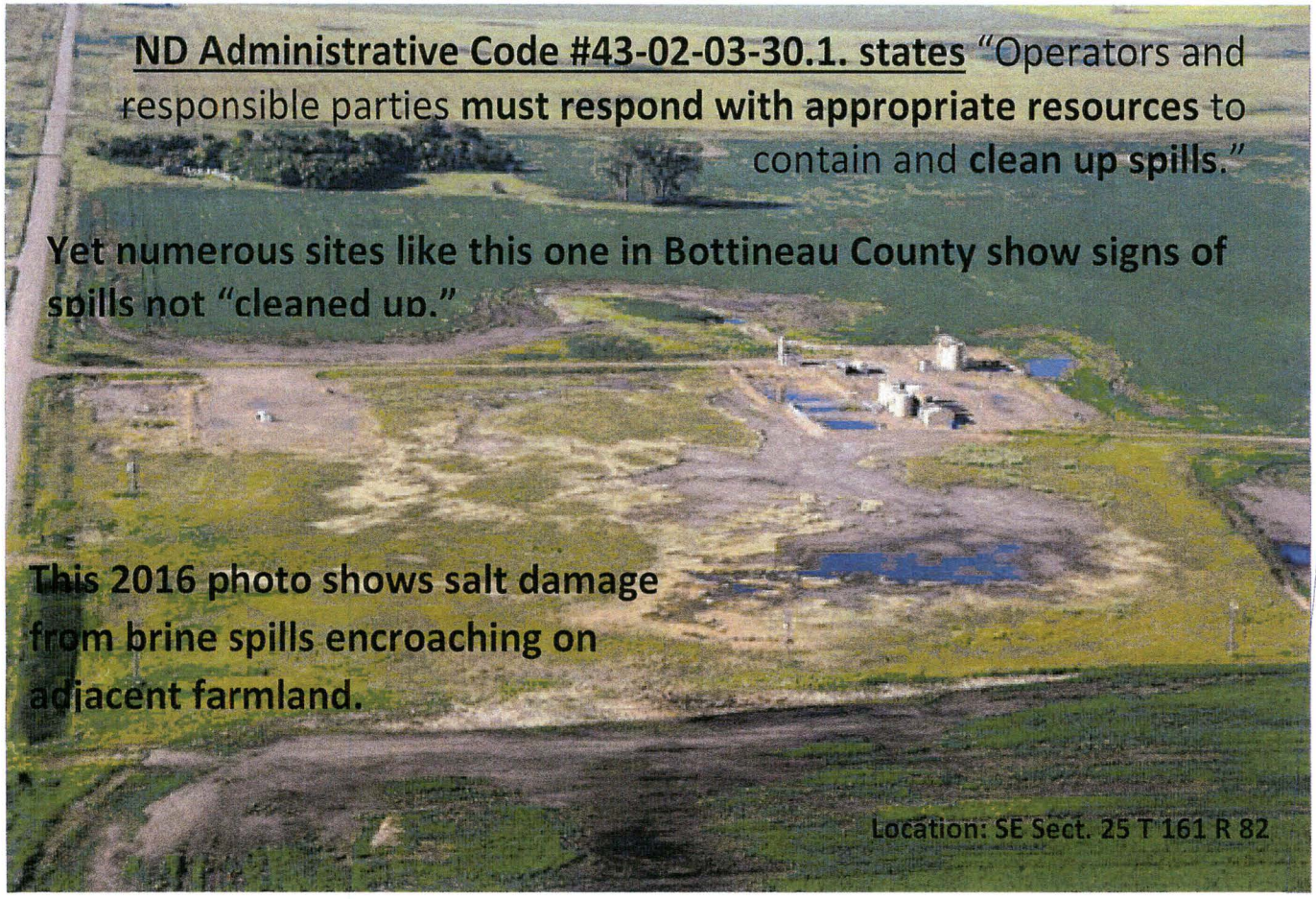
7



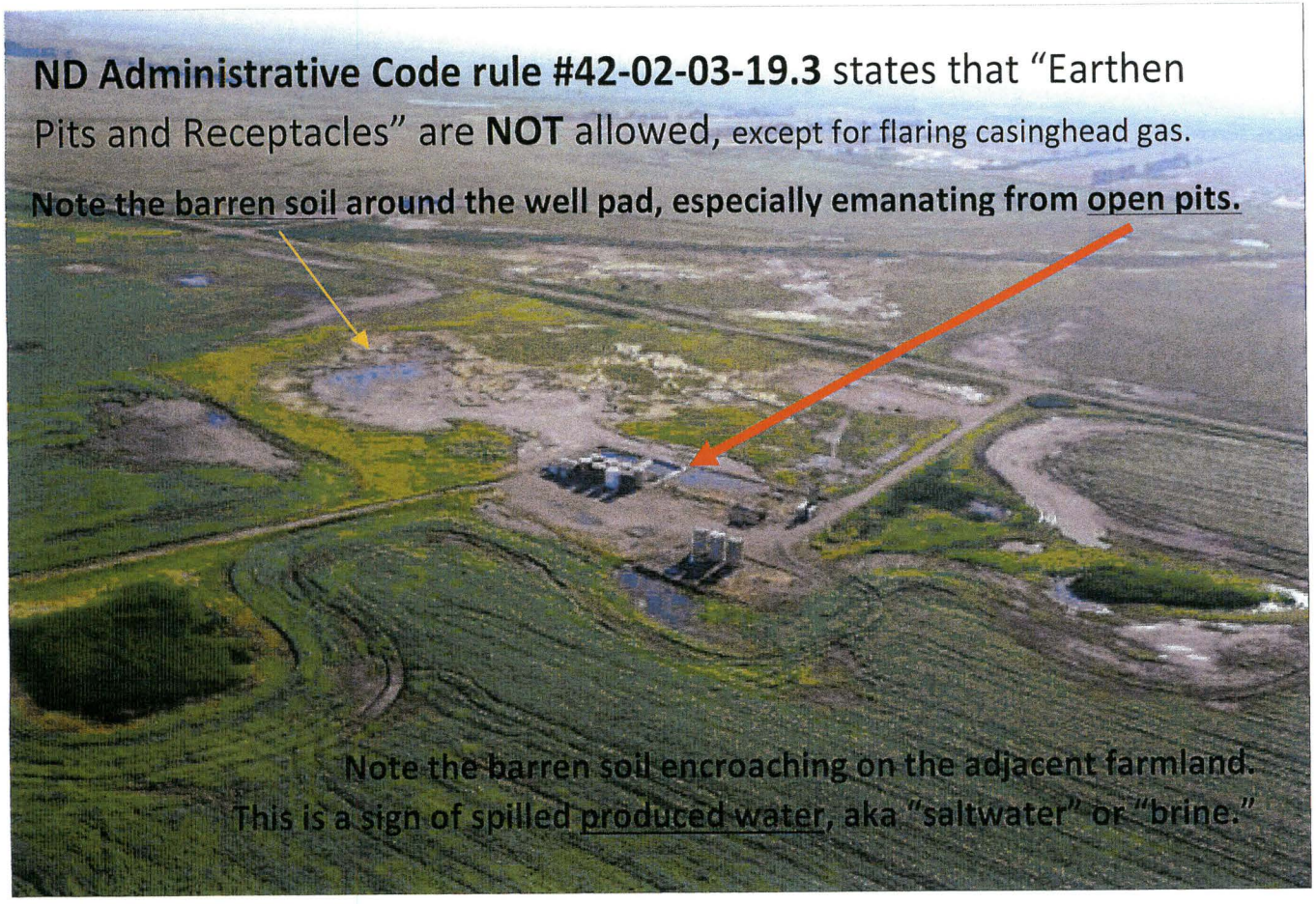
Comment 3: Location: West Section 5, T 161 R 82

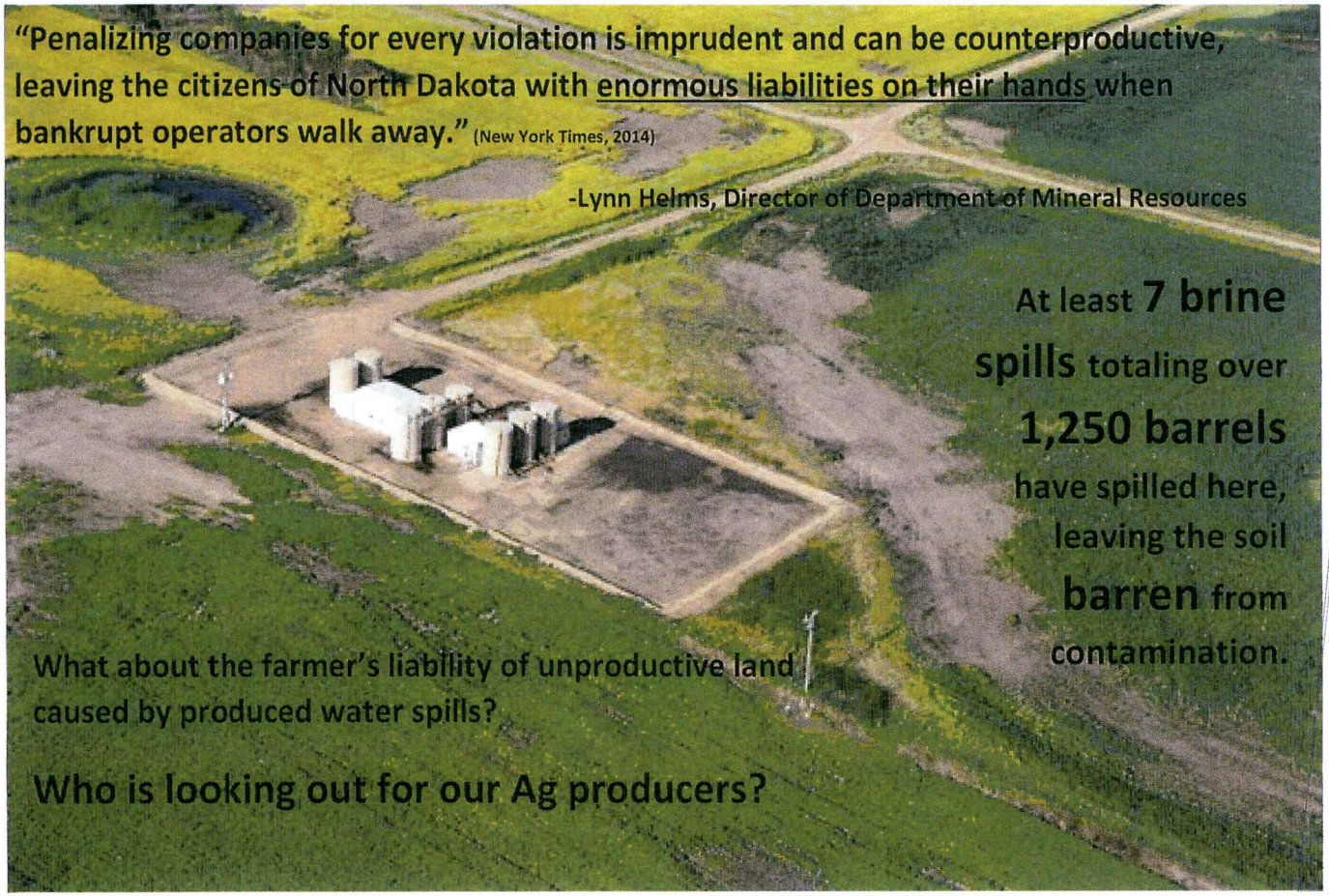

State officials have boasted that ND's spill reporting standards are the best in the nation.
Note the layer of salt atop the soil, emanating from the well pad. This is a sign of brine spills.
Yet, there is no spill report for this well site, and many others like it.
Location: Section 31 Township 161 Range 82


These spots are natural "prairie potholes"
These are *NOT* potholes.
These **barren areas** of soil bare the signs of **brine spills**, which occur daily in the oil patch.
When **bine-contaminated soil** is not removed, the salt remains in the soil and spreads, **damaging more farmland**.



Comment 4: 43-02-03-30.1. **LEAK AND SPILL CLEANUP.** At no time shall any spill or leak be allowed to flow over, pool, or rest on the surface of the land or infiltrate the soil. Discharged fluids must be properly removed and may not be allowed to remain standing within or outside of diked areas, although the remediation of such fluids may be allowed onsite if approved by the director. Operators and responsible parties must respond with appropriate resources to contain and clean up spills.

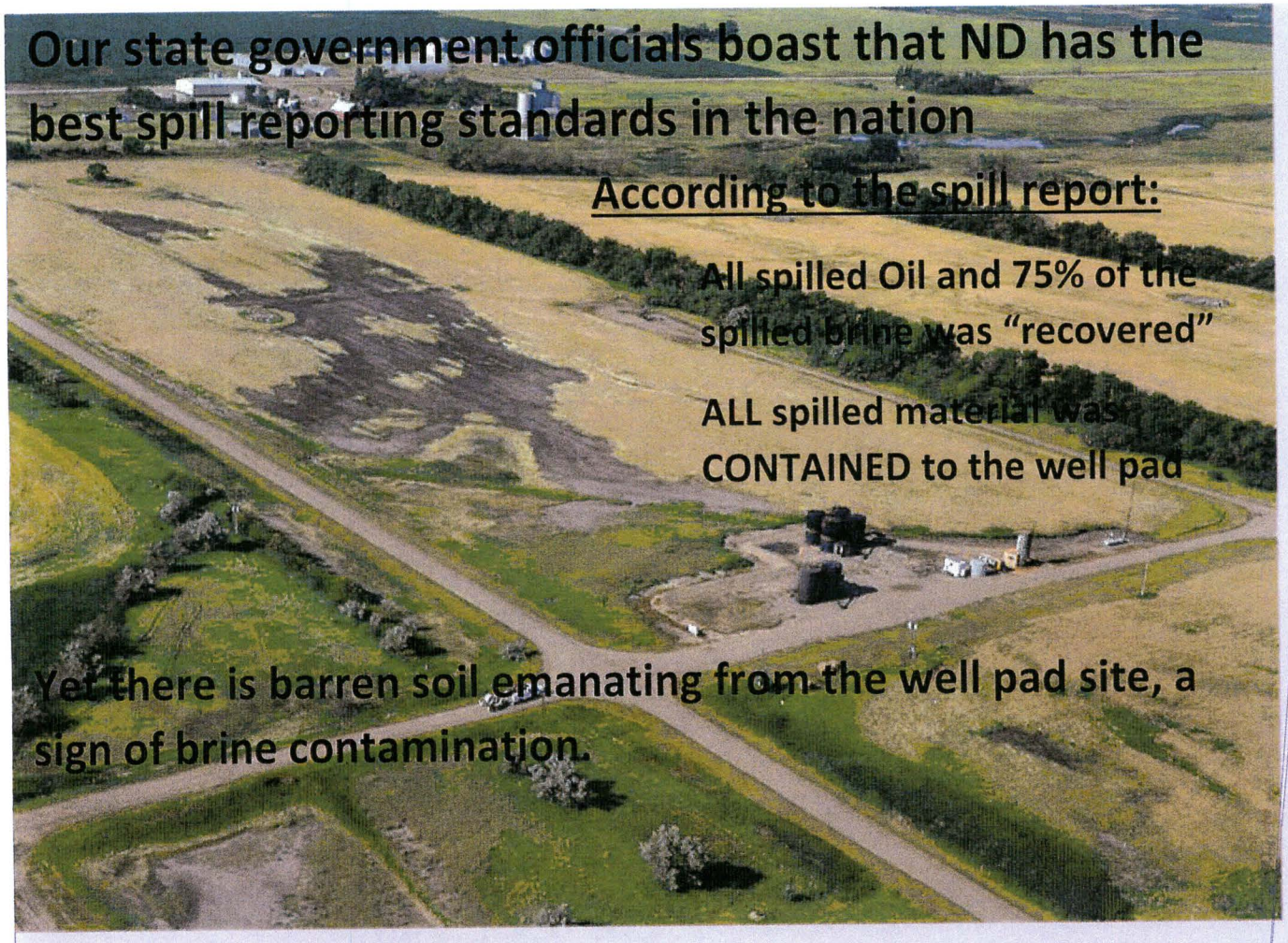

ND Administrative Code rule #42-02-03-19.3 states that "Earthen Pits and Receptacles" are **NOT** allowed, except for flaring casinghead gas.
Note the barren soil around the well pad, especially emanating from open pits.
Note the barren soil encroaching on the adjacent farmland.
This is a sign of spilled produced water, aka "saltwater" or "brine."



Comment 5: Location: NW Sect. 8 T 161 R 82

Comment 8: ND CENTURY CODE 38-11.1-01. LEGISLATIVE FINDINGS.

*1."It is necessary to exercise the police power of the state to protect the public welfare of North Dakota which is largely dependent on agriculture and to **protect the economic well-being of individuals engaged in agricultural production.**"*



Comment 6: The only spill reported for this site was in 2013 at just 10 gal. of OIL & 63 gal. of BRINE

Comment 7: Location: Sect. 22 T163 R83

#8
HB 1151 2PM
1-12-17

HB 1151 Testimony — Karen [redacted] Erickstad

January 12, 2017

Reps. Streyle, Dockter, Lefor and Sens. O. Larsen, Schaible, Unruh introduced: HB 1151: A BILL for an Act to amend and reenact section 38-08-04 of the North Dakota Century Code, relating to the reporting of well pad or oil and gas production facility fluid spills. Was read the first time and referred to the **Energy and Natural Resources Committee**

New Language:

"The commission may not require any person controlling or operating any well, or a facility that handles fluids used in the production of gas or oil, to report to the commission any spill or release of fluid confined to the oil well pad, production facility, or a production - related handling facility if the spill or release of fluid contains **ten or fewer barrels** of fluid."

Testimony:

Members of the committee, you have or will likely ask yourself before deciding on this bill, two questions:

- What is the purpose of this bill?
- What are the likely consequences of this bill, both positive and negative?

It seems to me that the intention of this bill is to ease the burden of spill reporting off the shoulders of oil companies. This would be a positive for employees and management within those companies, to be sure – but at what cost? There are two major costs of that.

1. **Data**

Obviously, this bill will cost us data – data that is valuable if actually used by the regulators with jurisdiction over oilfield spills.

2. **Transparency**

<u>Data:</u>

Why do we need this data? How could this data be useful? Well, frequent small spills – for which this bill would eliminate reporting - could be a sign that an oil company, or particular

employee, is not following proper safety precautions or protocol. Without documentation of these smaller spills, regulators would have no way of making a timely, well-informed decision to check-in with a particular oil company regarding their spill "track record" in order to have a conversation regarding the cause of these spills. A simple conversation between an Oil and Gas Division employee and a manager at an oil company with frequent, small spills could lead to systematic changes by the oil company or particular employee that would result in less spills.

Aren't our regulators at the Oil and Gas Division and the Dept. of Health supposed to be interested in preventing the number of spills that occur in the first place? Without data on the more frequent, smaller spills, regulators at those agencies will have no means of accurately assessing risk and taking action to prevent larger, more damaging spills.

Transparency:

I'm all for making jobs easier, but not at the expense of transparency.

My background is in science – both my bachelors and master's degrees. In science fields you learn very early on, that all data is to be reported, even it if doesn't fit your hypothesis or desired outcome. To not report all data is considered unethical. I suggest that the oil industry should be held to an ethical standard such that they be required to inform stakeholders of any and all spill events that occur.

Why, you ask? What purpose does that serve? Isn't that just slowing down the oil company for no good reason? I would say no.

The proponents of this bill would likely say that this bill will not harm the environment or public health. That is because they are basing their conclusion on the incorrect assumption that all liquids spilled on the well pad that are reported as "contained" to the well pad remain on the surface and do not penetrate the soil.

This is an incorrect assumption for two reasons, at least:

1. **The well pad is not impermeable to liquids.**

Lynn Helms has described the well pad as a "TV tray" in the past, claiming that the well pad is a surface impermeable to liquids, including oil, brine, and other chemicals. This is not true.

I suggest you consult a soil scientist for specifics on this matter, but if you would like first-hand evidence I encourage you to talk to landowners who have had oil and/or saltwater disposal wells "reclaimed" on their land.

Alternatively, you could even view "reclaimed" well sites where the well pad has been removed and you will find in many cases that the area around the plugged well does not support vegetation except for highly salt-tolerant weeds.

In effect, even spills that are "contained" to the well pad in terms of the areal extent, are, in effect, not contained to the surface because they penetrate the soil vertically. Thus the notion of "contained" spills is questionable to begin with.

2. **Spills reported as "contained" to the well pad, are often NOT contained to the well pad.**

This is a separate and distinct point from my previous point. My previous point was that the spills that do not extend past the boundaries of the well pad on the surface – so called "contained" spills – can and do penetrate the soil beneath the well pad.

My point here, is that some spills reported as "contained" are not – not even in the sense which they are currently believed or understood to be contained. Spills reported as "contained" sometimes extend past the boundaries of the well pad and onto the surrounding land.

How do I know this? By looking at the spill reports.

Operators can report a spill as "contained," and the Health Department will not necessarily send an inspector to the site. However, if you view the spill reports and follow-up notes to those reports – which I have – you will find that occasionally a wise Department of Health staff person will check on the site anyway – either with a phone call or actual physical visit - and their follow-up comments will sometimes state that the spill was NOT contained to the well pad. Meaning, the spilled liquids actually ran off the sides of the well pad and reached the farmland or grassland surrounding it.

In conclusion, we need reporting of small spills because

1. Data -the data is useful in preventing larger spills – if we choose to use it;
2. Transparency - the public deserves to know what operators are being good stewards of the land.

I say stewards of the land because after repeated spills, even small ones, there is no such thing as containment to the well pad – it's impacting the land – which ultimately affects our agriculture economy and potentially public health.

#9
HB 1151
read by Nicole
Donaghy
1-12-17

January 12, 2017

HB 1151

House Energy & Natural Resources Committee

Chairman and members of the committee:

I oppose HB 1151. Ten barrels of fluid, which could be crude oil or saltwater, is 420 gallons of contamination. What are the chances it will be properly cleaned up if it does not have to be reported to the commission? If I was buying a parcel of land in an oil-producing county, I would check with the Oil and Gas Division to see if there had been any spills on it in the past. If a site has been reclaimed which contained an unreported spill of 420 gallons which wasn't cleaned up, the land could be worthless. Assuming the requirement remains to notify the landowner of a spill, there would be no official record of the spill to inform a potential buyer. It could easily affect the future use of that parcel of land. What if a company has several spills of 420 gallons on the same site? The cumulative amount spilled could be thousands of gallons—on one site. Another scenario is when sites flood. I have had water released from a site onto my land deliberately. A spill not cleaned up can travel off the site during spring thaws or heavy rains.

A spill is a spill. For accuracy in total spills, **whether monthly or yearly, all should be reported. Cleanups should be required for the benefit of the landowner, wildlife, and the environment in which we live. Therefore, I ask that you please give HB 1151 a Do Not Pass recommendation.**

Thank you.

Shelly Ventsch

New Town, ND

(Copy of Digital Attachment HENR010517)

North Dakota Mineral Resources
Status and Outlook

House Energy and Natural Resources Committee

January 5, 2017

Lynn D. Helms, Director
Department of Mineral Resources
North Dakota Industrial Commission

HB 1014
One-Time Projects

WILSON M. LAIRD CORE AND SAMPLE LIBRARY

(2015-2017)

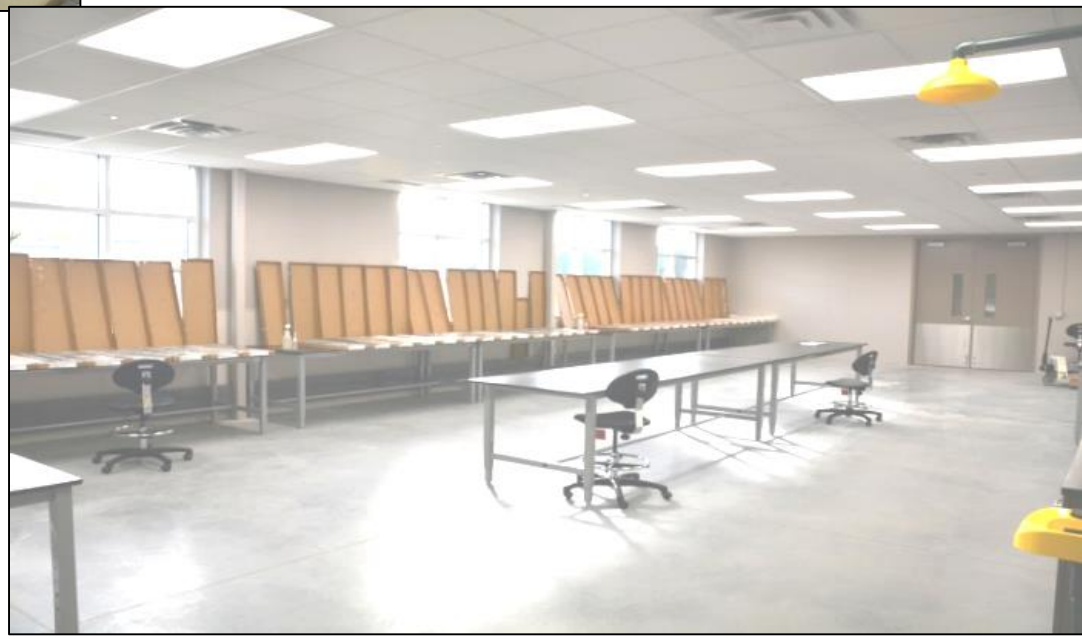
During the 2015 legislative session we received $13.6 million from the Strategic Investment and Improvements Fund (SIIF) to expand and remodel the Wilson M. Laird Core and Sample Library.

We added a 12,000-square-foot, two-story structure that contains three core labs on the first floor, five smaller labs on the second floor (a core photo lab, student core lab, microscope lab, core gamma ray lab, and an analytical lab), office space, and a conference room.

An additional 28,000 square feet was added onto the existing 13,000 square foot warehouse.

The old core lab (900 ft^2).

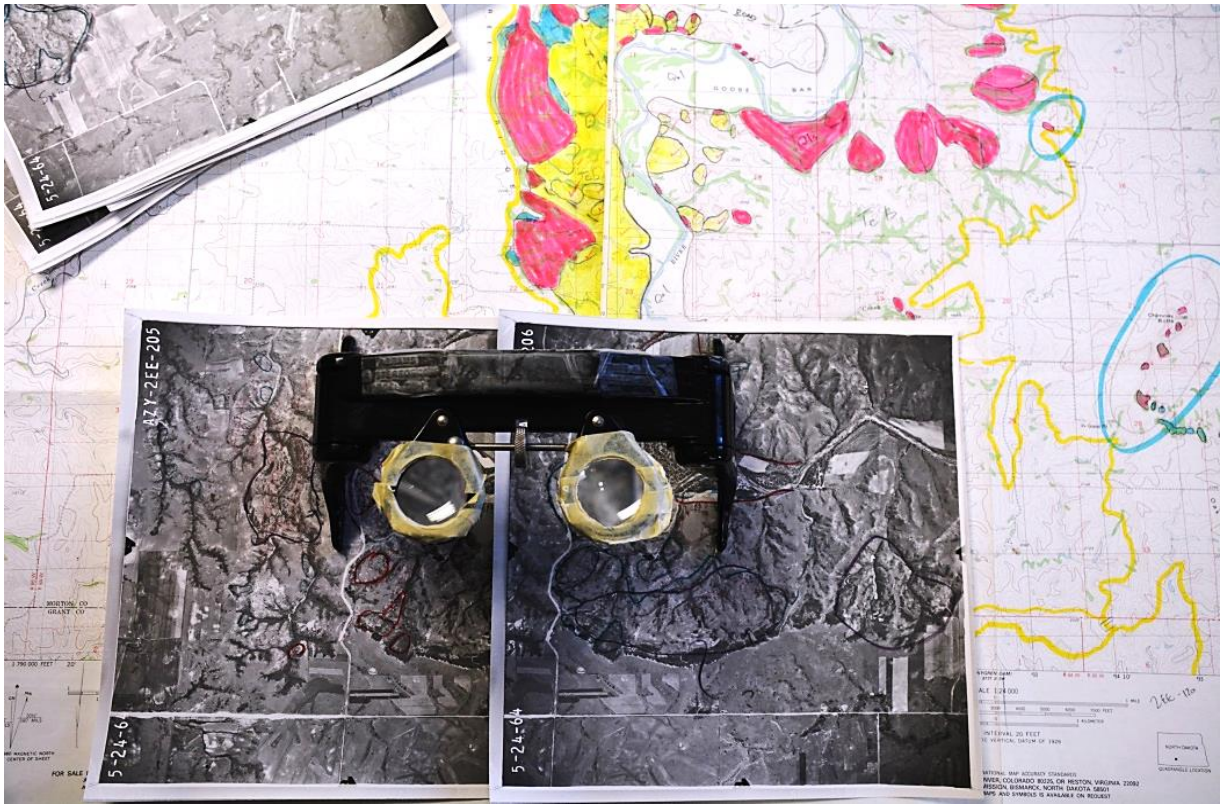
One of three new core labs on the first floor (1,300 ft^2).



AERIAL PHOTOGRAPHS (2015-2017)

The Geological Survey has 50,000 aerial photographs of North Dakota in our collection that were flown between 1957 and 1962 (stereo pairs).

Last legislative session we received funding to fill in the gaps in this collection -- so far we have obtained 6,188 of the missing 6,543 photos. The remainder to be ordered in 2017.



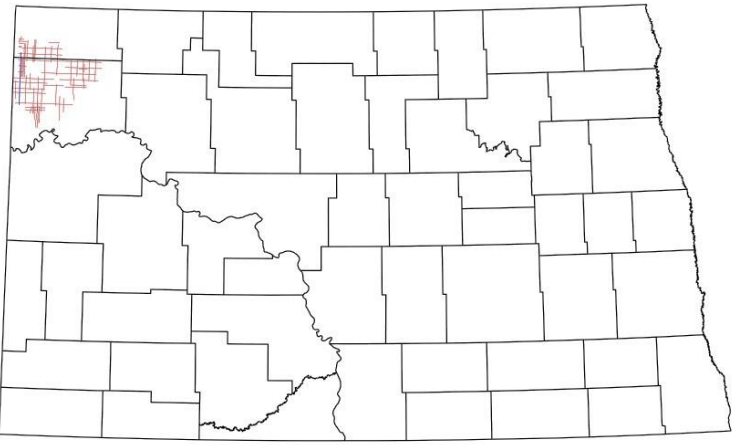
Mapping landslides in western Morton County with a stereoscope.

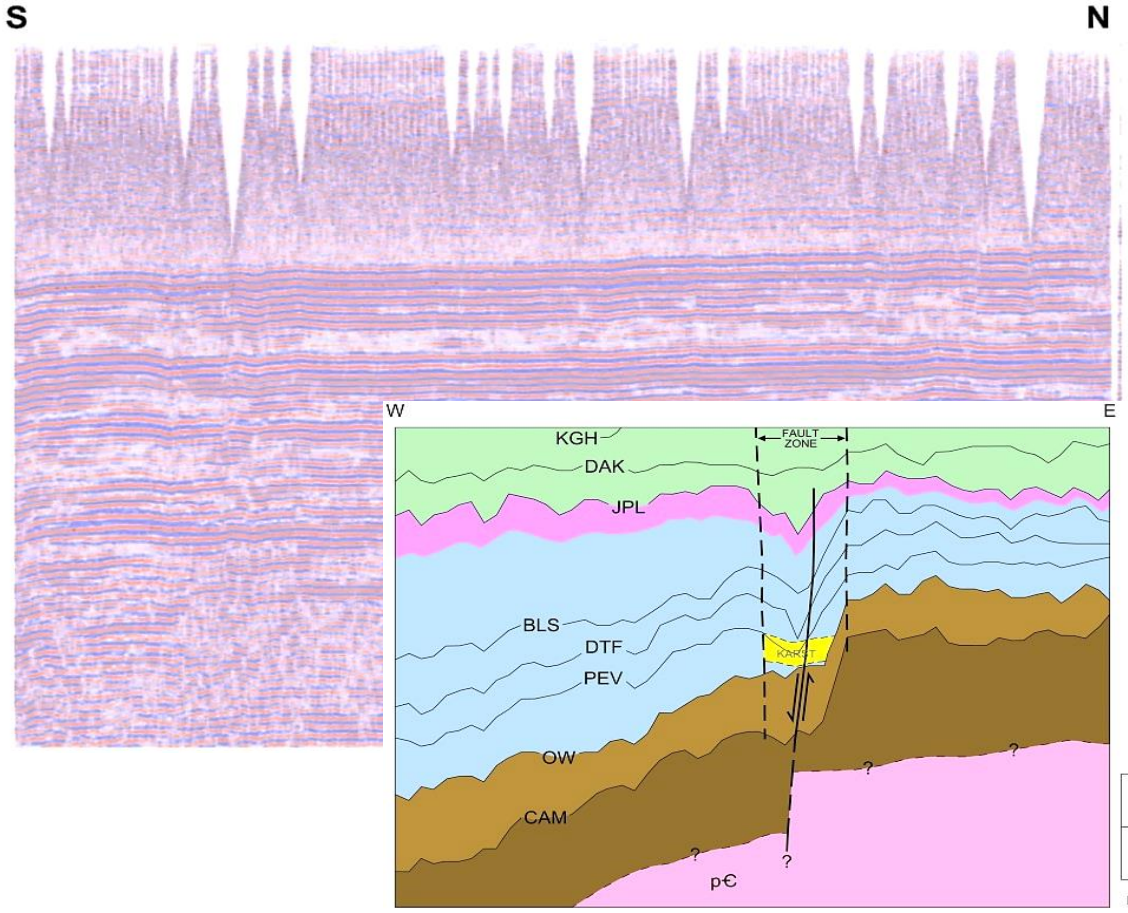
DIGITAL CONVERSION OF 2D SEISMIC PROJECT (2015-2017)

Twenty-five years ago Chevron Oil Company donated 409 ND seismic lines to the Geological Survey.

We are converting those paper seismic traces into a digital format so they can be interpreted.

At the end of this biennium there will be 52 seismic lines remaining to be interpreted.





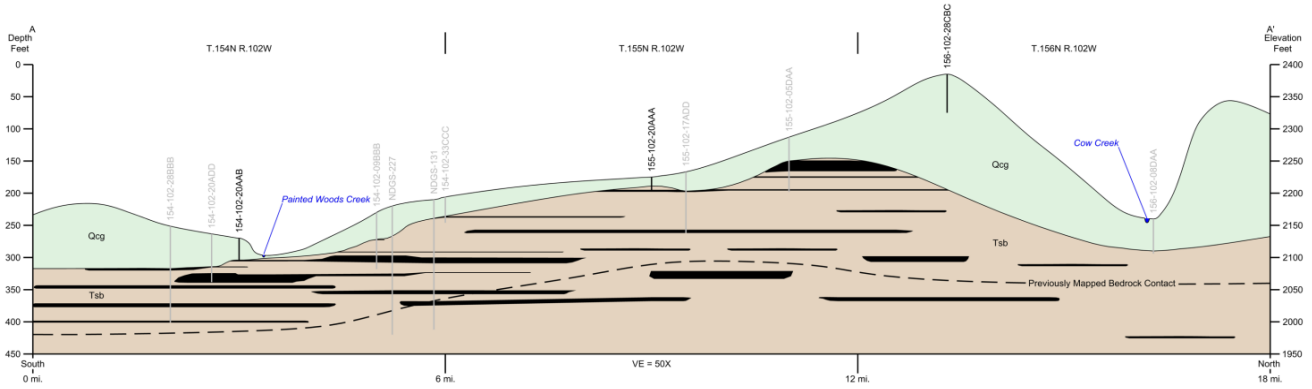
SHALLOW DRILLING AND SAMPLING PROGRAM (2015-2017)
Drilling Project

Seven test holes were cored last fall in the greater Williston area in Williams County.

Hole depths ranged from 16 - 60 feet.

Engineering properties are being run on 63 sediment samples.

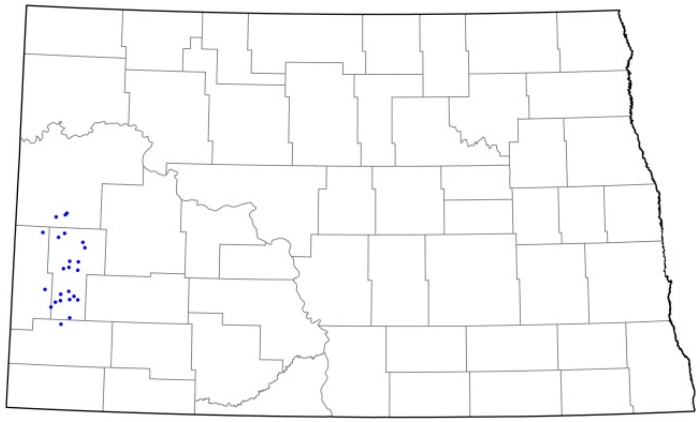
Results will assist infrastructure development.



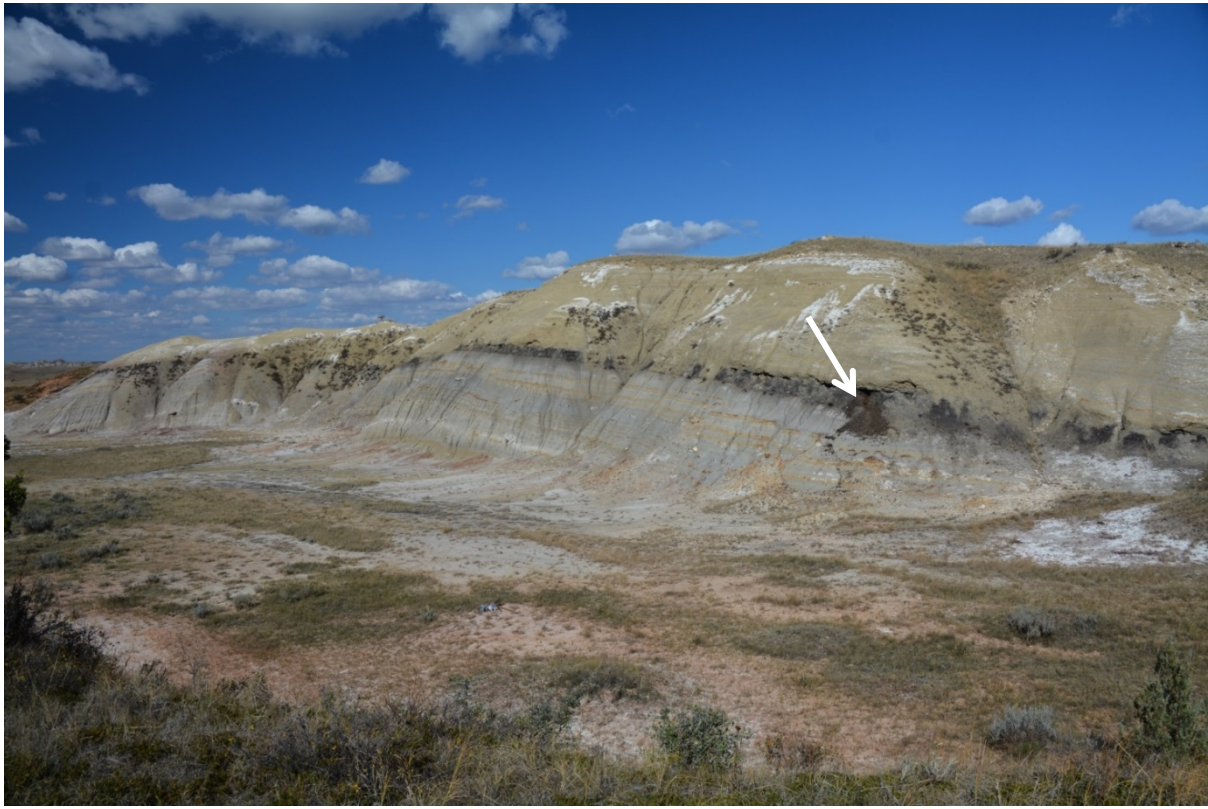
SHALLOW DRILLING AND SAMPLING PROGRAM (2015-2017)
Rare Earth Sampling Project

270 coal samples were collected in Billings, Slope, Golden Valley, & McKenzie counties.

We collected samples from 26 different locations involving 62 beds of coal.



Sample Sites



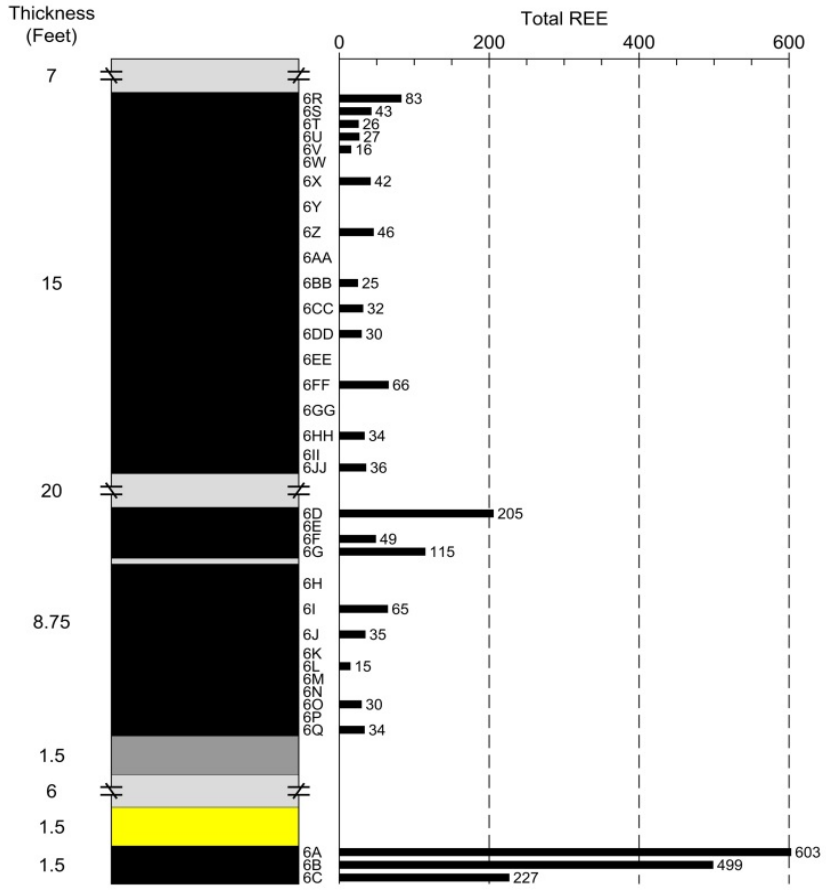
Pit dug into six foot coal for sampling (six inch samples).

100 sample results in -- as we suspected from our work with uranium and other metals, the highest concentrations of rare earth elements tends to occur at the very top of the coal bed.

Rare earth concentrations ranged from 15 – 603 parts per million with an average 90 parts per million.

100 additional samples have been submitted for analysis.

Sample site along the Little Missouri River, Billings Co.

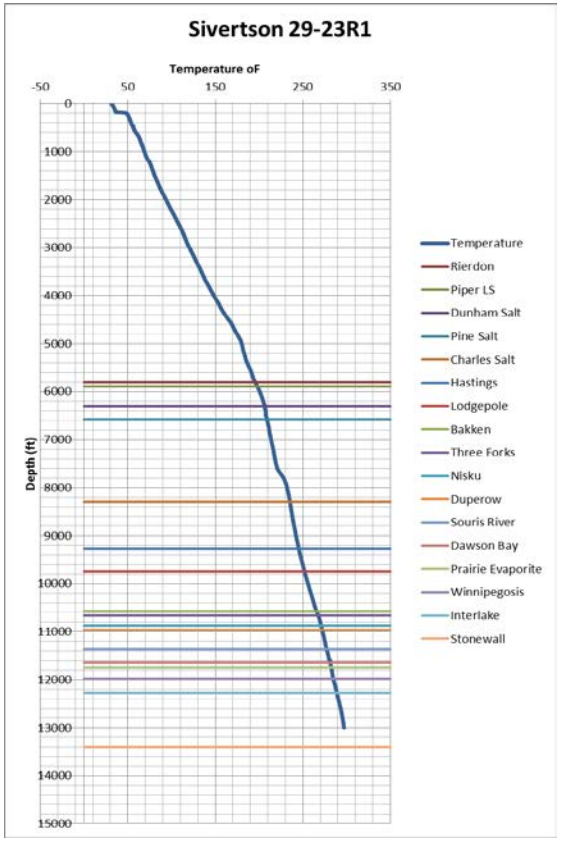


DEPARTMENT OF MINERAL RESOURCES – GEOLOGICAL SURVEY
WILLISTON BASIN TEMPERATURE PROFILE PROJECT

To date we have temperature logged 23 oil wells.

We are planning to log 77 additional wells as time and funding allow to complete this phase of the project.

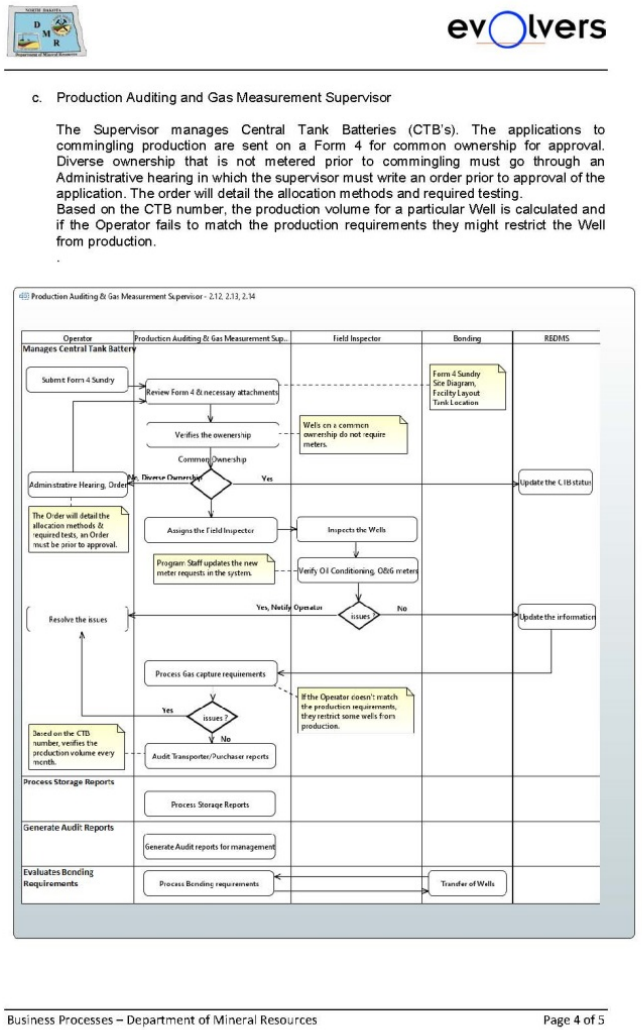
We will then scale the project back to log unique wells as they become available.



Photograph above: Temperature logging a 10,000 foot well in Mountrail County.
Graph on the right: Temperature profile of the Sivertson 29-23R1 in McKenzie County

HB 1014
RBDMS Update

- Business Process Modelling and Analysis-Engagement with Evolvers Group from Austin, Texas. Concluded report on 12/30/16
- Resulting business requirements document will provide insight on necessary upgrades.
- Upgrade programming of RBDMS with either:
  - In-house IT staff
  - Independent Consultants
  - Multi-state Consortia engagement



evolvers

c. Production Auditing and Gas Measurement Supervisor

The Supervisor manages Central Tank Batteries (CTB's). The applications to commingling production are sent on a Form 4 for common ownership for approval. Diverse ownership that is not metered prior to commingling must go through an Administrative hearing in which the supervisor must write an order prior to approval of the application. The order will detail the allocation methods and required testing.
Based on the CTB number, the production volume for a particular Well is calculated and if the Operator fails to match the production requirements they might restrict the Well from production.

Business Processes – Department of Mineral Resources Page 4 of 5

HB 1032
Abandoned Well Plugging & Site Reclamation Fund "AWPSRF"

HB 1032: AWPSRF Balance Sheet Fiscal Year 2015- Nov. 30, 2016

• July 1, 2015 beginning balance	$11.5 Million
• **Revenue**	**$7.5 M**
– Gross Production Tax	$6.7 M
– Conf. Bonds/Civil Penalties	$0.3 M
– OGD Fees	$0.4M
• **General Program**	**$1.8 M**
– Plugging and Reclaim	$1.7 M
– Illegal Dumping	$0.1M
• **Legacy Program**	**$1.2 M**
– Site Reclaim	$0.9 M
– Study	$0.3 M
• **Legislative Transfers**	**$2.1 M**
• **AWPSRF**	**$13.9 Million**

HB 1068
Considerations of Jurisdictions

HB 1068
Considerations of Jurisdictions

- Details regarding rules can be found in our FAQ.
  https://www.dmr.nd.gov/oilgas/rulechangesfaq2016.asp
  - Underground Gathering Pipelines
  - Berms
  - Saltwater Handling Facilities
- Considerations for Orders can be located in the order findings.
- Permit Policies 1.01 and 2.01 can be found under policies and guidance on our website.
  https://www.dmr.nd.gov/oilgas/2014Permitting(2).asp
  - Results reported quarterly to NDIC

HB 1068
Reports to Jurisdictions

https://www.dmr.nd.gov/oilgas/informationcenter.asp

- Director's Cut Page 3:
- Gas capture statistics are as follows:
- Statewide 85%
- Statewide Bakken 86%
- Non-FBIR Bakken 88%
- FBIR Bakken 77%
  - Trust FBIR Bakken 83%
  - Fee FBIR 59%

- Director's Cut Pages 4-9:
- BIA- Rights of Way
- BLM
  - OSO 3, 4, 5
  - Venting/Flaring
  - Hydraulic Fracturing
  - Sage Grouse
- EPA
  - Drinking Water Report
  - RCRA
  - Methane/ICR
  - Clean Air Act
  - Chemical Disclosure
  - WOTUS
- USFWS
  - Endangered Species
  - Management of Non-Federal OG Rights

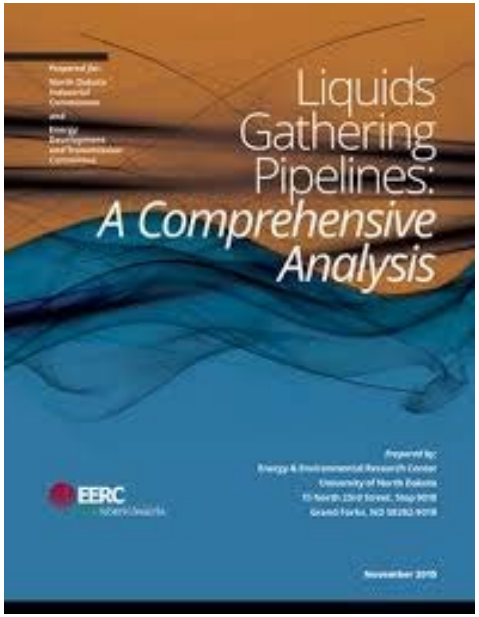
HB 1358
Pipelines
Spills
TA Wells
AWPSRF
Studies, Legacy Sites, Long Term Budget

History –HB 1358

North Dakota Century Code Section 38-08-27

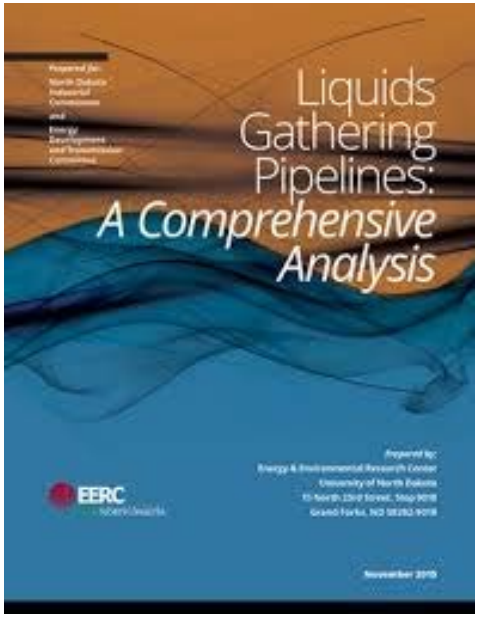
- Upon request, the operator shall provide the commission the underground gathering pipeline engineering construction design drawings, list of independent inspectors, and a plan for leak protection (after August 1, 2015).
- Within 60 days of an underground gathering pipeline being placed into service, the operator of that pipeline shall file with the commission an independent inspector's certificate of hydrostatic or pneumatic testing of the underground gathering pipeline.
- Commission may now require a bond (amendment to 38-08-04 §1).
- Surface owner may now share GIS information (amendment to 38-08-26).
- The commission shall adopt the necessary administrative rules necessary to improve produced water and crude oil pipeline safety and integrity.
- Effective April 20th, 2015.

EERC Study – "Liquids Gathering Pipelines: A Comprehensive Analysis"



- Phase I – Provided the report with recommendations to the NDIC and the Energy Development and Transmission Committee on December 1st, 2015.
- Following receipt of the Phase I report the NDIC Oil and Gas Division began rulemaking.
- NDIC Oil and Gas Division used 15 of the 23 recommendations while drafting proposed administrative rule changes (the other 8 are policy and industry best practice recommendations)

EERC Study – "Liquids Gathering Pipelines: A Comprehensive Analysis"



EERC Study Key Finding #3	The analysis of spill data highlights the need to examine how data is collected and compiled within the state system.
Resulting Recommendation	• **ND should streamline the ways spill data are reported, processed, and analyzed to facilitate data analysis**. • **DMR should collect and analyze data to determine root causes of pipeline leaks, then continually refine regulations that address root cause determinations**.

HB 1358
Pipeline Program and Regulations

Focus of the rules for Crude Oil and Produced Water Gathering Pipelines

Bonding

Notification

- Prior to new construction, repairs, integrity testing.
- Damage

Installation

- Properly trained installation crews
- Proper handling, backfilling, and minimum cover depth.
- HDD Plan

Pipeline Reclamation

Third-Party Independent Inspectors

- Responsible for ensuring the pipeline is installed as prescribed by the manufactures specifications are precisely followed.

Above ground associated facilities

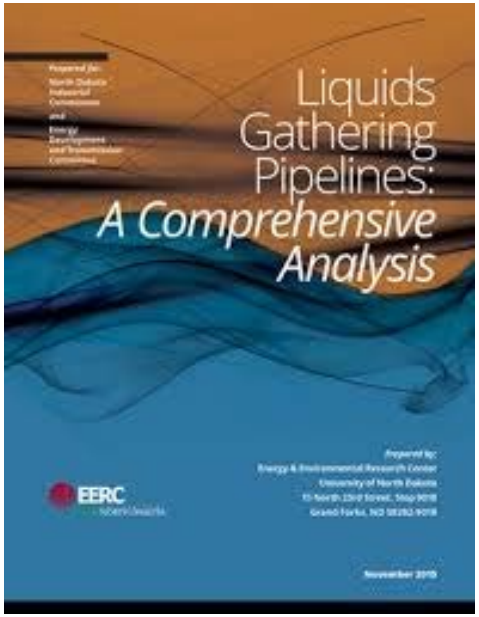
Leak Protection, and Monitoring

Spill Response

Data Sharing

Pipeline Integrity

EERC Study – "Liquids Gathering Pipelines: A Comprehensive Analysis"



Observation	Most of the industry's standard methods for leak detection are called out in API 1130 for regulated transmission pipelines. Advanced LDS methods are used infrequently by North Dakota gathering line operators**.**
EERC Study Key Finding #17	Company decisions regarding implementing new pipeline monitoring and leak detection technology rely upon, among other things, analysis of the cost and benefit. There is a need for objective data on the performance of different leak detection technologies under real-world conditions.
Resulting Recommendation	**The gathering pipeline monitoring and leak detection pilot project prescribed by HB1358 will serve as a platform to test current and new leak detection technologies applied to gathering systems. This pilot project will test performance, determine infrastructure requirements, estimate costs to pipeline operators, and provide objective analysis of the cost/performance ratio**.

EERC Study – "Pipeline Leak Detection-Field Evaluation of Multiple Approaches for Liquids Gathering Pipelines"

	Overall		Constant Pressure*	Unpressurized	
	No LDS	LDS	SCADA	SCADA	SCADA + CPM
Average Volume Released Before Alarm, bbl	676	75	47	107	38
Time to Detect, hr			1–3	1–6	1–2

* Note: Constant pressure pipeline systems evaluated during this project were also smaller, less complex systems.

Table 15. Summary of Constant Withdrawal Rate EERC-Modeled FWT Spill Volumes

	Average, bbl	Max., bbl	Min., bbl
All 17 FWTs	75	299	<1
Five Tests on Pressurized Systems, SCADA	47	202	<1
Eight Tests on Unpressurized Systems, SCADA	107	299	12
Four Tests on Unpressurized Systems, CPM	38	90	16
All 17 Tests after 24-hr Manual Flow Accounting	676	1199	132

Table 16. Comparison of SCADA and Communication Costs

	SCADA	Radio Communication	Cellular Communication	Fiber-Optic Communication	Total
SCADA + Radio	$71,000	$62,000	–	–	$133,000
SCADA + Cellular	$71,000	–	$43,000 + access fees	–	$114,000
SCADA + Fiber Optic, Retrofit	$71,000	–	–	$3,400,000	$3,471,000

HB 1358
TA Well Reviews

- 18 cases for 18 wells.
  - TA Status Affirmed: 3 cases
  - TA Status Revoked: 8 cases
  - Dismissed: 5 cases
  - Pending on 01-19-17 docket: 2 cases

- 206 of 463 TA wells are eligible for hearing.

Abandoned Well Plugging and Site Restoration Fund "AWPSRF"

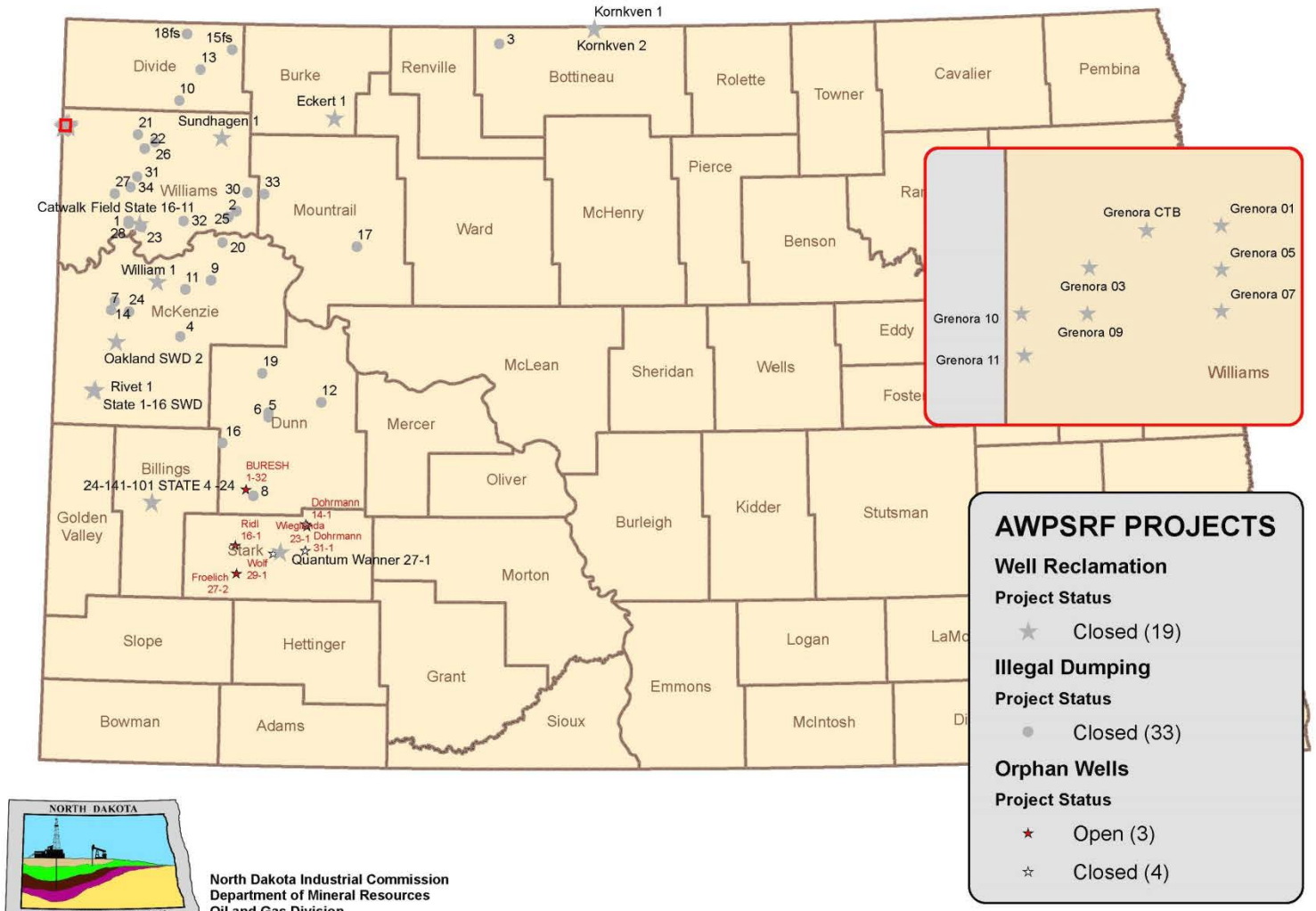
- Established 1983
- Pay plugging and reclamation costs where no responsible party exists
- Originally funded by:
  - Fees paid to the Oil and Gas Division
  - Confiscated bonds
- Amended 2013 the fund is currently supported through a combination of:
  - A portion of the gross production tax ($7.5 million per fiscal year)
  - Fees paid to the Oil and Gas Division
  - Confiscated bonds
  - Collected civil penalties
- The AWPSRF currently has approximately $14.2 million dollars
  - Fund capped at $100 million
  - General Program
  - Legacy Program limited to $1.5 million per biennium

AWPSRF – General Program

- General Program
  - Plugging and reclamation of sites (1983-present)
    - Where a company has defaulted on their responsibilities and the state seized the bond, equipment, and salable oil
    - The commission shall seek reimbursement for all reasonable expenses incurred in plugging any well or reclaiming any well site through an action instituted by the Attorney General
  - Illegal dumping of oil-field waste
    - Examples include:
      - Production Water
      - Filter Socks
      - Frac fluid and proppant
      - Production equipment

AWPSRF – General Program

Abandoned Well Plugging and Site Restoration Fund Program (AWPSRF)



AWPSRF PROJECTS

Well Reclamation

Project Status

★ Closed (19)

Illegal Dumping

Project Status

● Closed (33)

Orphan Wells

Project Status

★ Open (3)

☆ Closed (4)

NORTH DAKOTA
OIL AND GAS DIVISION

North Dakota Industrial Commission
Department of Mineral Resources
Oil and Gas Division

State 4-24: Re-plugging
Billings County, ND; Spring 2016

Well PA 1984 – 2 historical operators – no longer exist

State 4-24: Re-plugging
Billings County, ND; Spring 2016

State 4-24: Re-plugging
Billings County, ND; Spring 2016

$180,000 – re-plugged and reclaimed

AWPSRF #9: Illegal Dumping McKenzie County, ND; Winter 2014-Spring 2016

Salt water dumped off county road onto private pasture
Affected ½ mile of drainage and two stock ponds
No responsible party identified

AWPSRF #9: Illegal Dumping McKenzie County, ND; Winter 2014-Spring 2016

AWPSRF #9: Illegal Dumping McKenzie County, ND; Winter 2014-Spring 2016

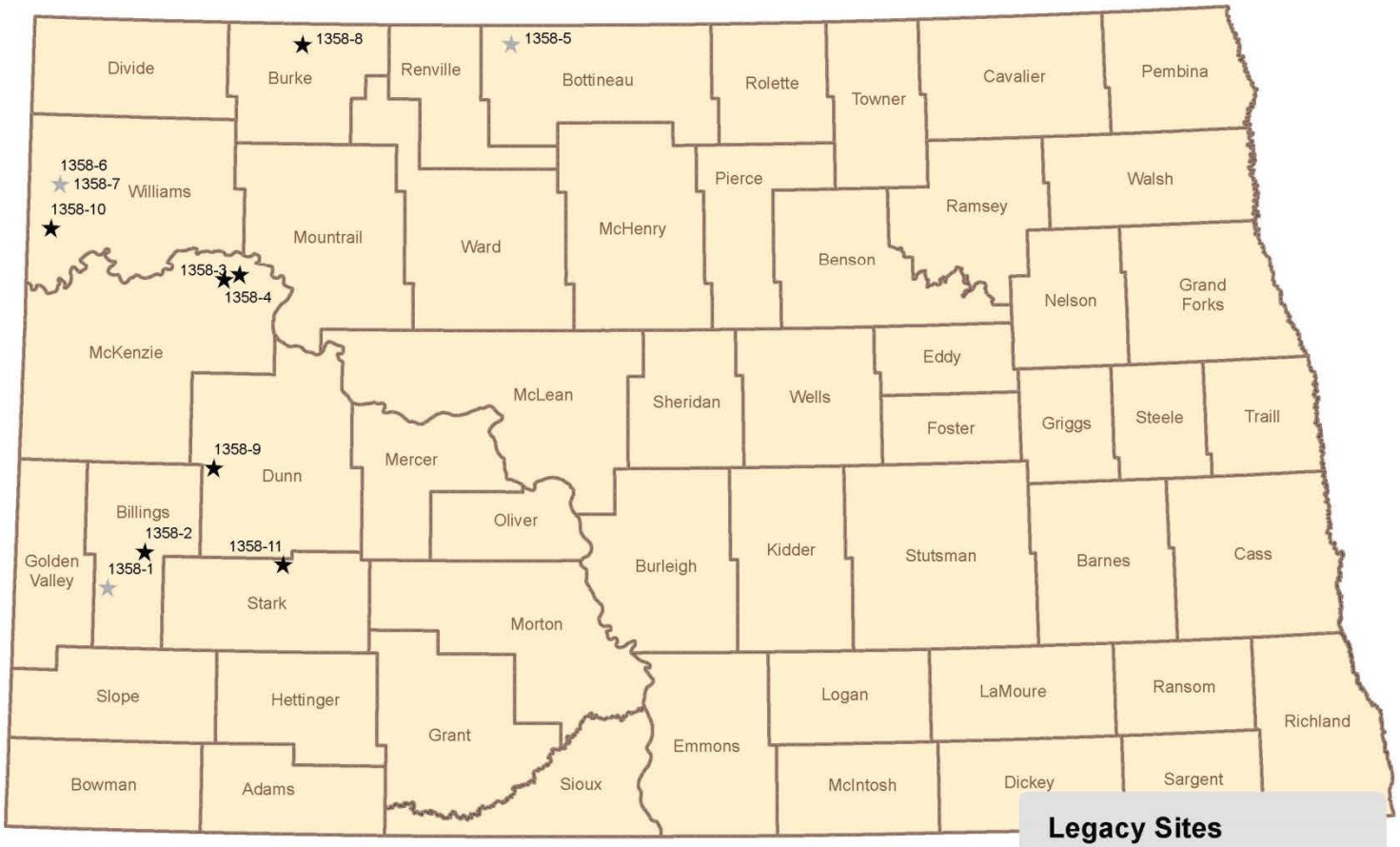
$456,000 - remediation, reclamation, revegetation

AWPSRF - Legacy Program

- 2015 State Legislature expanded the scope of the AWPSRF to include the legacy program
- Allocated additional $1.5 million dollars per biennium
  - Dedicated to “legacy” pre-1983 oil field issues
  - No continuing reclamation responsibility covered under state law
    - Situations originated prior to state laws requiring reclamation
  - Allowed AWPSRF to cover reclamation of eligible pre-1983 oil filed issues
  - Examples include:
    - Reclaiming old reserve pits
    - Properly abandoning old flowlines
    - Plugging seismic “shot holes”

AWPSRF - Legacy Program

House Bill 1358 Legacy Sites



North Dakota Industrial Commission
Department of Mineral Resources
Oil and Gas Division

1358-1: Historical Reserve Pit
Billings County, ND; Fall 2015-Spring 2016

Dry hole plugged and released from bond in 1966
Met all reclamation requirements at the time
Reserve pit eroding into Little Missouri River

1358-1: Historical Reserve Pit
Billings County, ND; Fall 2015-Spring 2016

1358-1: Historical Reserve Pit
Billings County, ND; Fall 2015-Spring 2016

$569,000 – excavated and reclaimed

1358-5: Flow line
Bottineau County, ND; Fall 2015

Wells plugged in 1968 and 2001
No flow line abandonment rules at that time
Flow line to central tank battery

1358-5: Flow line
Bottineau County, ND; Fall 2015

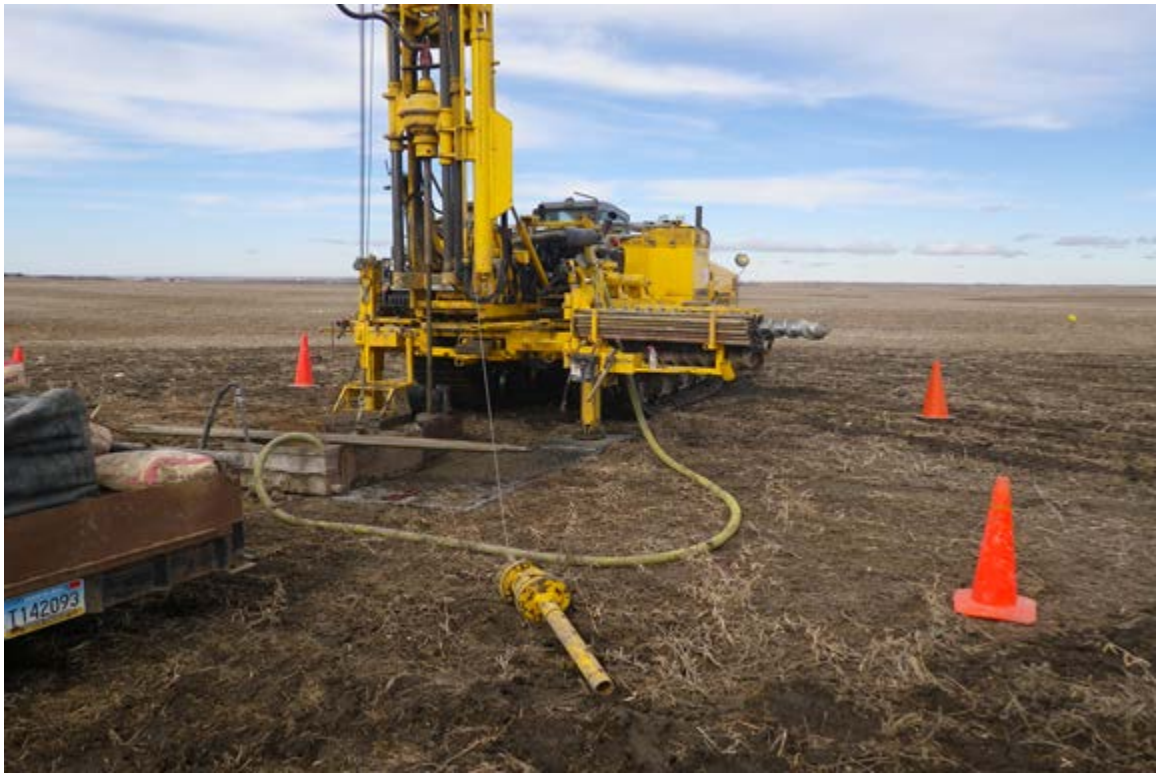
1358-5: Flow line
Bottineau County, ND; Fall 2015

$102,000 – excavated, reclaimed, and reseeded

1358-6/7: Plugged Shot Holes
Williams County, ND; Fall 2015-Spring 2016

Artesian flow from 11 seismic shot holes improperly plugged in the 1970s
Approximately 30 acres too wet to farm

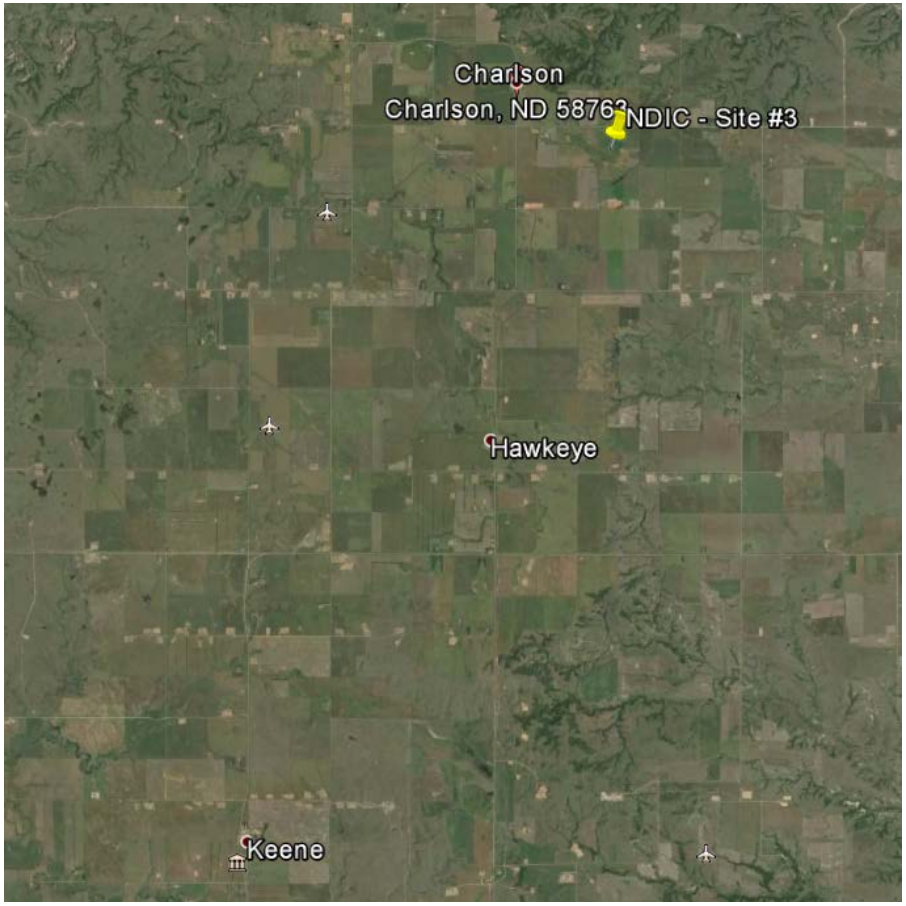
1358-6/7: Plugged Shot Holes
Williams County, ND; Fall 2015-Spring 2016



1358-6/7: Plugged Shot Holes
Williams County, ND; Fall 2015-Spring 2016

$115,000 – plugged and ready to farm next spring

Future Site – Pit Washing into Little Antelope Creek SE of Charlson, NE of Keene, ND



Approximately 12 miles Northeast of Keene, ND

Pit washing into coulee.

Short-Term Budget Estimated Costs

	Description	Status	Cost estimate	Project Cost to Date
Site #1	Pit	Done		$568,853
Site #2	Pit		$678,000	$33,997
Site #3	Pit		$2,742,400	$45,861
Site #4	Doesn't Qualify			
Site #5	Leaking Pipeline	Done		$102,200
Site #6	Seismic Shot Holes	Done		$65,458
Site #7	Seismic Shot Holes	Done		$53,814
Site #8	Possible Leaking well		$190,000	
Site #9	Seismic Shot Holes		$47,000	
Site #10	Seismic Shot Holes		$26,000	
Site #11	Seismic Shot Holes		$50 to 70K	
Total			$3.75 million	$870,183

Drilled in 1959 by Cardinal Petroleum (Edson Brown #1). Produced oil from 1959-1970. Converted to a saltwater disposal well by Phillips Petroleum in 1978 (Stratton SWD #1). The site contained two brine holding ponds from 1959 to at least 1970 (with dimensions of 100 x 90 ft and 60 x 100 ft and 5 feet deep). Produced 178,000 barrels of saltwater.

In 1984-1985 NDSU estimated 500 tons of NaCl in the top 10 feet of the Stratton Site. This works out to 22 tons per acre for this site.

STRATTON SWD #1

A high salt plume extends laterally around the site over an area of 250,000 ft2 (about 6 acres).

This plume extends to a depth of more than 80 feet (highest concentrations in top 40 feet).

Brine plume restricted to till and not impacting any useable water supply (ND Health Dept. concurred in 2006).

Chloride levels at 160 feet (500 - 750 mg/l) appear to be coming from the underlying Fox Hills Formation (hydraulic heads).

Long Term Budget with Brine Pond Remediation

Years	Max Wells	Well Plug & Reclaim	Illegal Dumping	Legacy Sites	Brine Ponds	Total
2007-2012	9,244	$729,506				
2013-2017	18,222	$278,314	$1,924,728	$2,879,956		$3,339,705
2018-2022	30,001	$701,653	$1,104,283	$8,473,500	$9,535,600	$19,815,037
2023-2027	41,379	$1,039,259	$1,104,283	$5,084,100	$28,266,053	$35,493,695
2028-2032	54,126	$1,360,907	$635,290		$42,777,547	$44,773,744
2033-2037	65,336	$1,690,010	$635,290		$46,713,600	$49,038,901
2038-2045	65,336	$2,890,880	$1,016,464		$73,595,546	$77,502,890
		$7,888,341	$4,749,731	$16,437,555	$200,888,347	$229,963,974

SB 2343
orders, regulations, or policies with >$20 million fiscal impact

SB 2377
Definition of Coal and Leonardite

North Dakota Century Code (38-12.1-03):

1. "Coal" means a dark-colored, compact, and earthy organic rock with less than forty percent inorganic components, based on dry material, formed by the accumulation and decomposition of plant material. The term includes lignite in both oxidized and nonoxidized forms, whether or not the material is enriched in radioactive materials. The term does not include commercial leonardite.

3. "Commercial leonardite" means a dark-colored, soft, earthy rock formed from the oxidation of lignite coal, and is produced from a mine that has as its only function for supply for purposes other than gasification or combustion to generate electricity.

Three-Dimensional Geologic Model of Northwestern North Dakota

Surface Mapping
Landslides
Sand and Gravel
Coal
Rare Earths
Geothermal
Uranium

Salt-Water Disposal

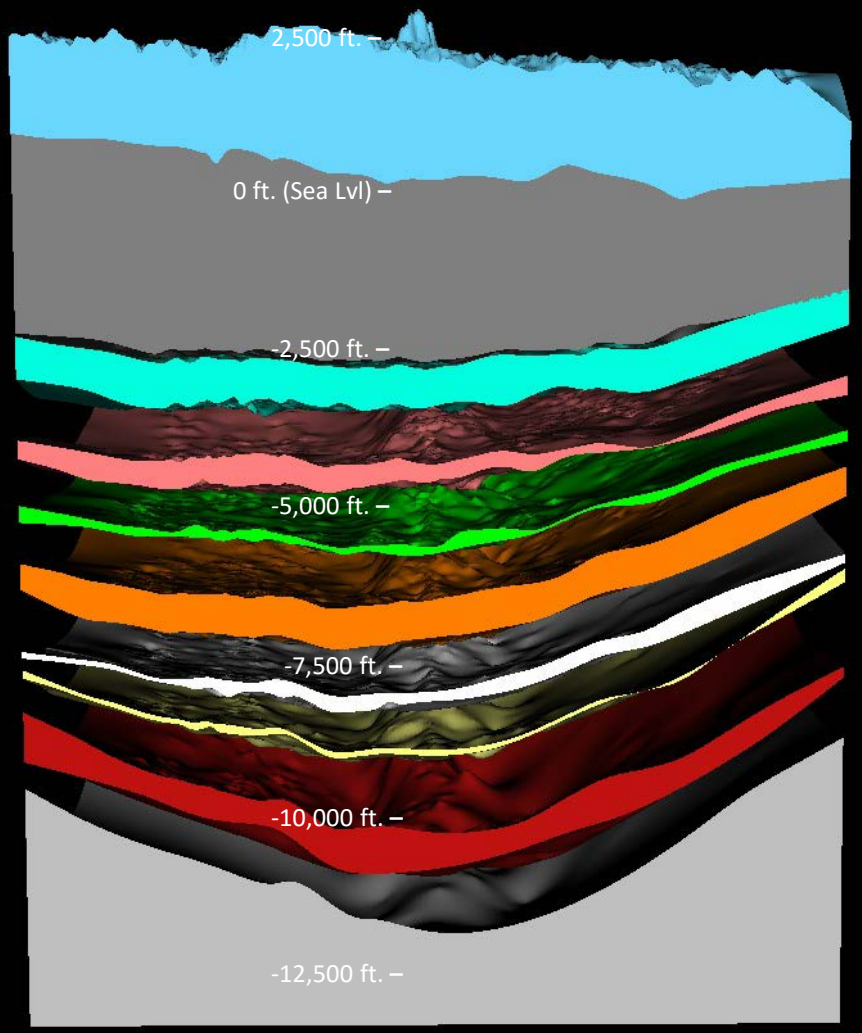
Oil & Gas

Oil & Gas

Oil & Gas

Oil & Gas
Potash

Deep Oil & Gas



Fresh Water Zone

Shallow Gas Zone

Dakota Group

Spearfish Formation

Tyler Formation

Madison Group

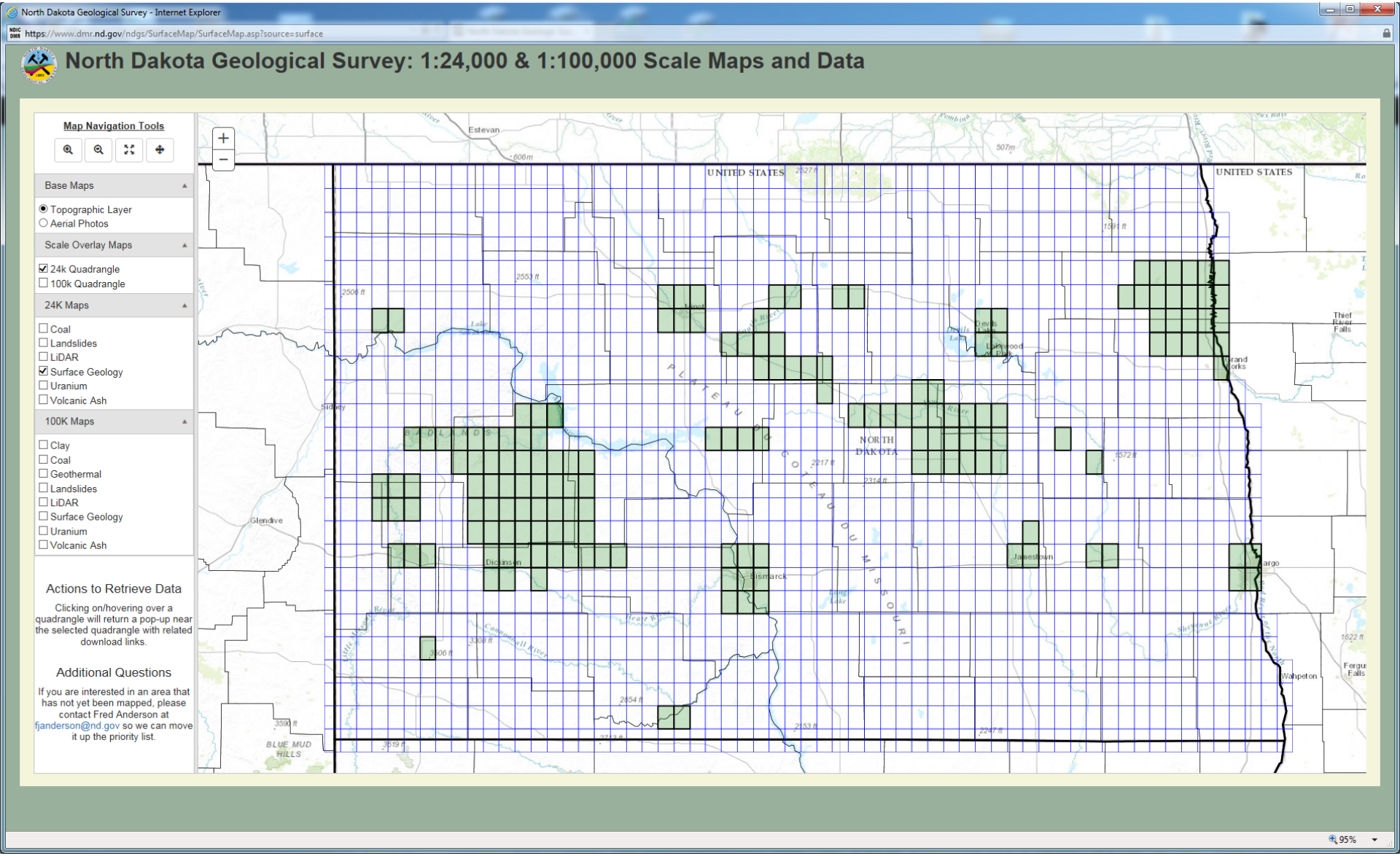
Bakken-Three Forks

Prairie Formation

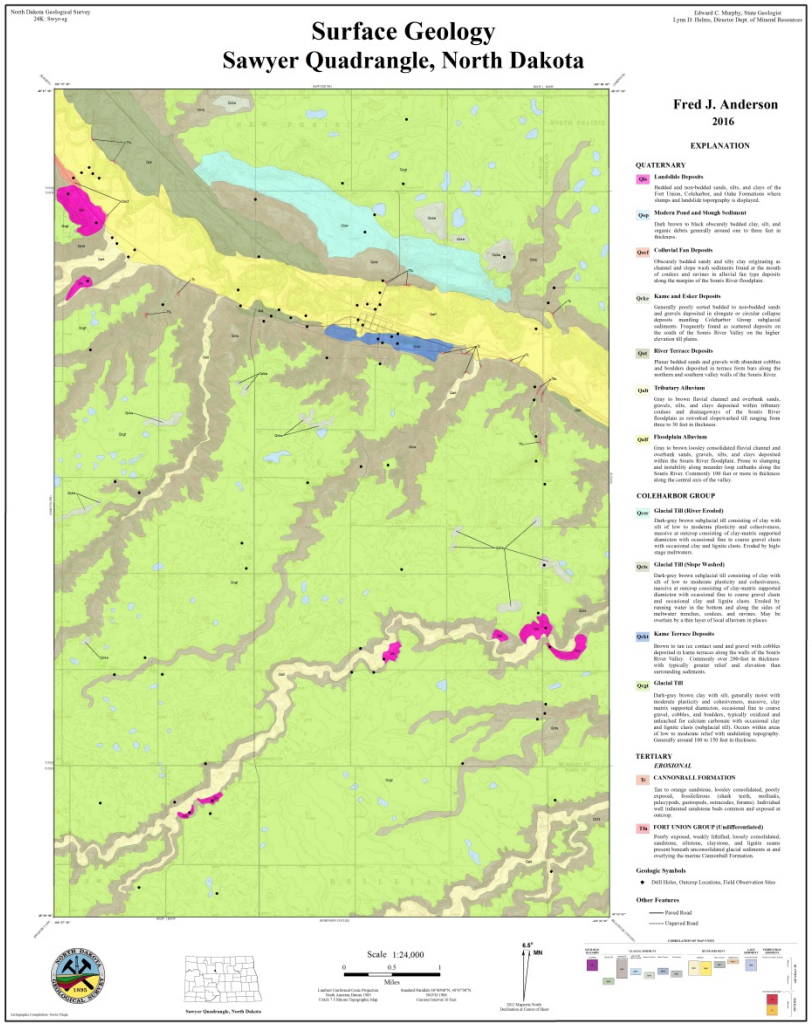
Red River Formation

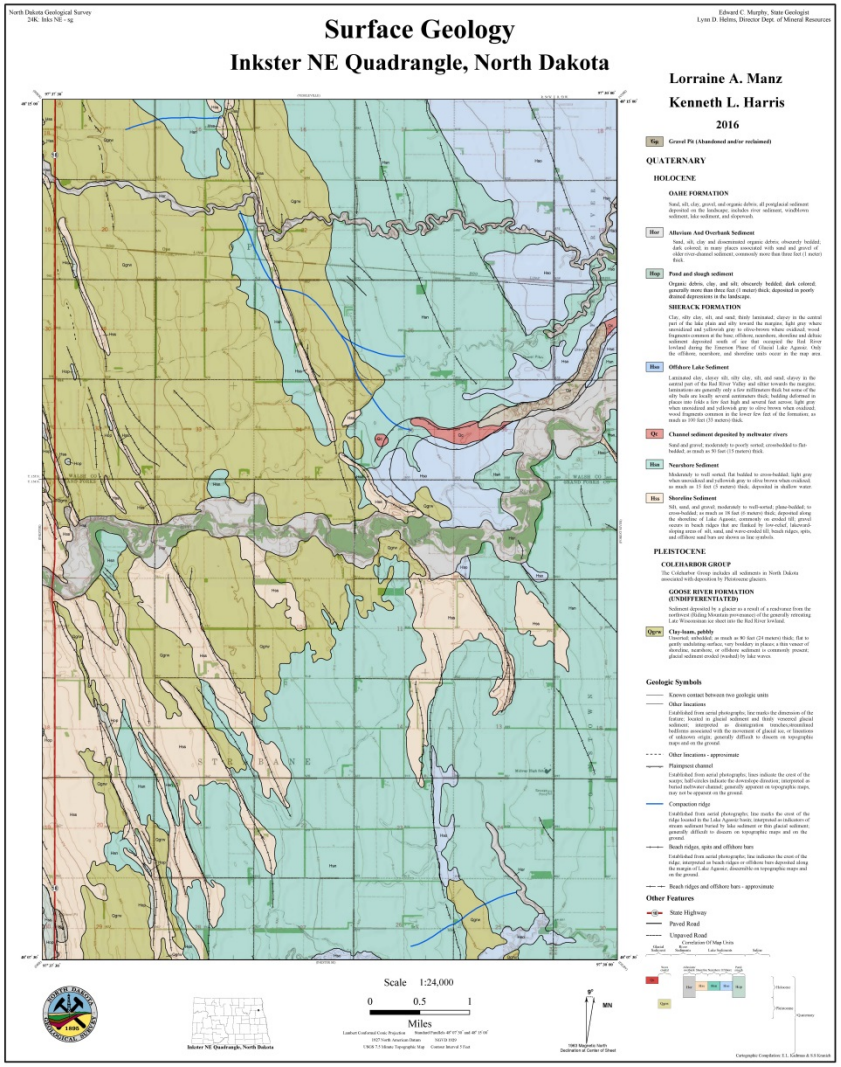
Precambrian Basement

SURFACE GEOLOGY MAPS

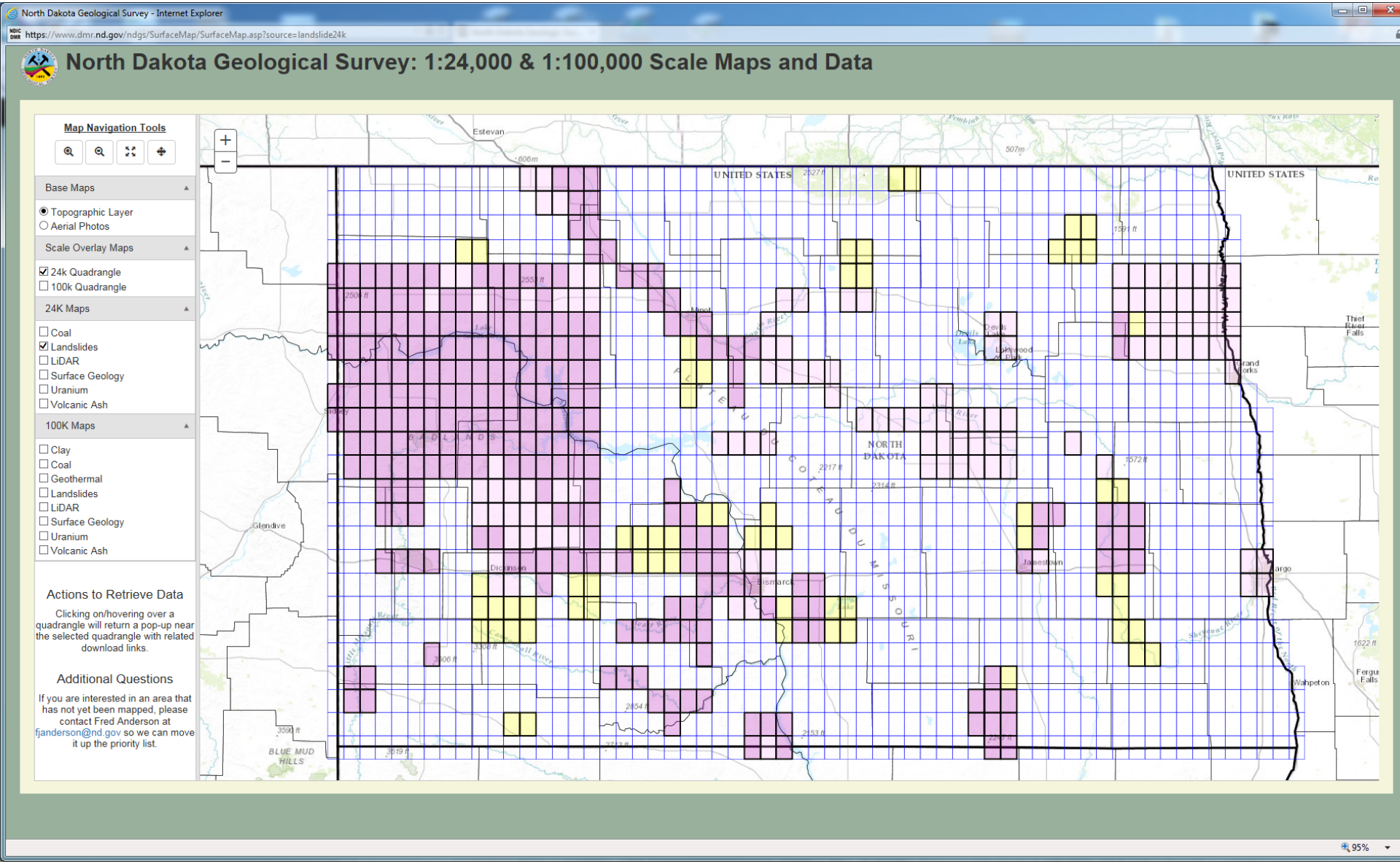


SURFACE GEOLOGY

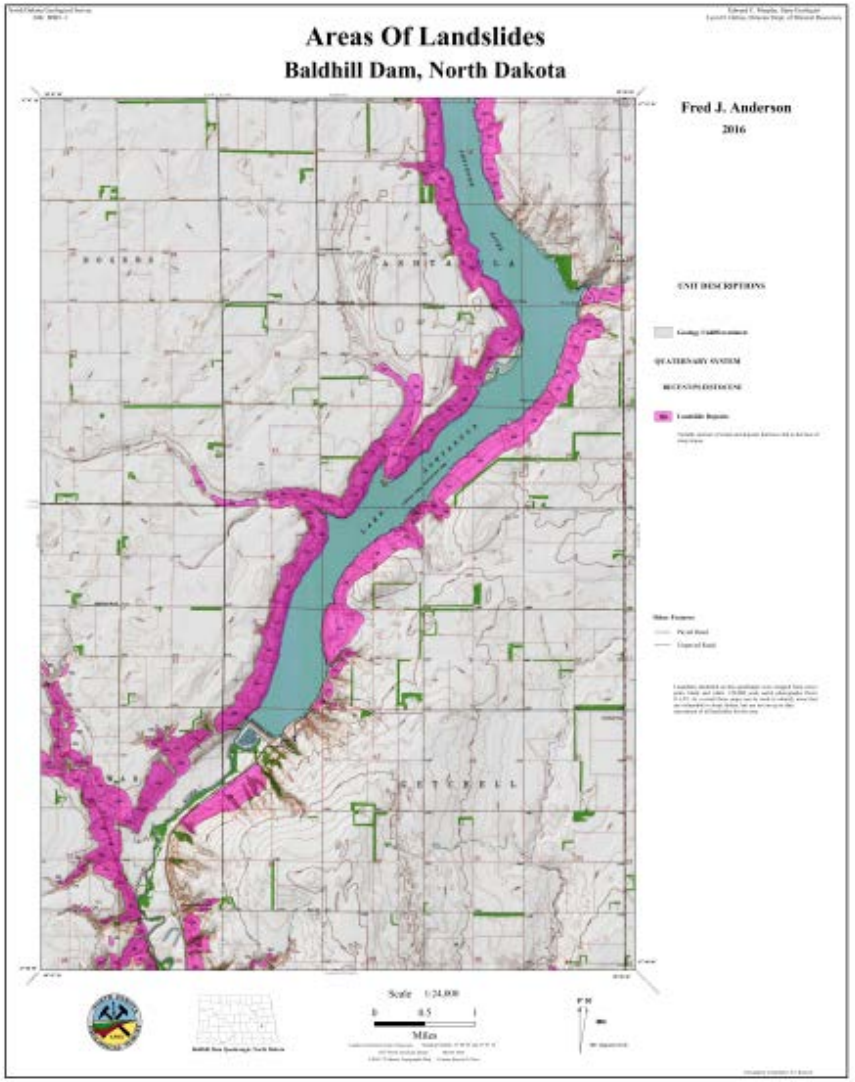


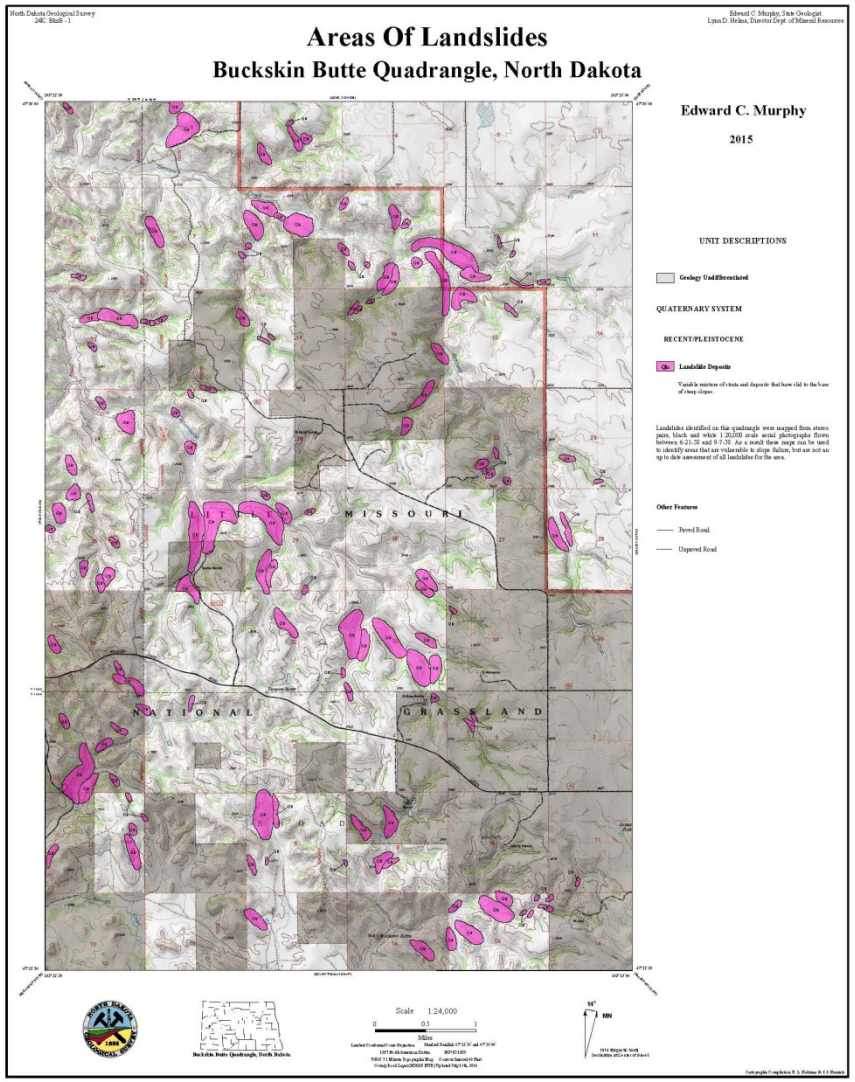


LANDSLIDE MAPS

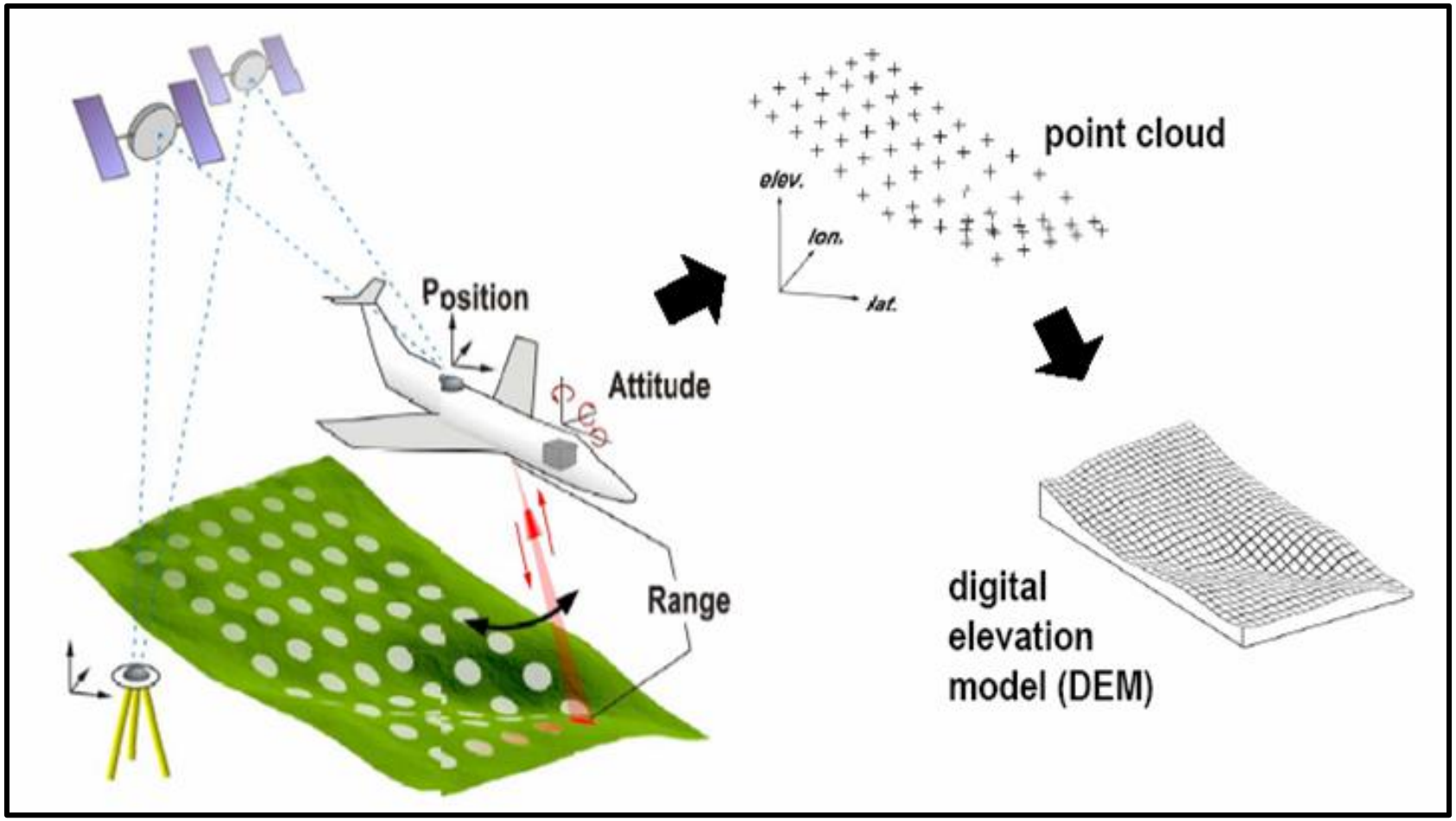


LANDSLIDES


Areas Of Landslides
Baldhill Dam, North Dakota
Fred J. Anderson
2016
UNIT DESCRIPTIONS
QUATERNARY SYSTEM
RECENT/PLEISTOCENE
Scale 1:24,000
Miles

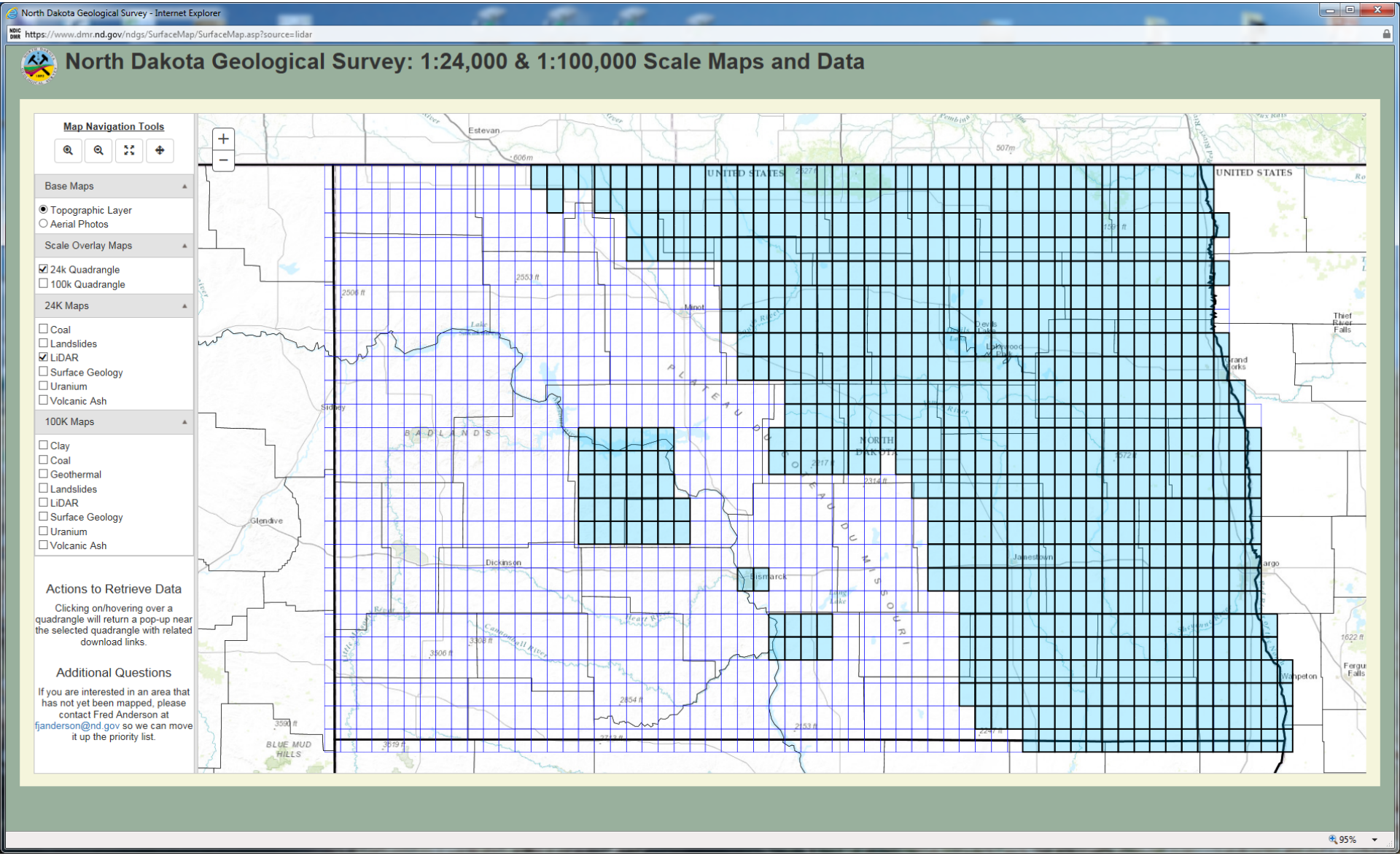

Areas Of Landslides
Buckskin Butte Quadrangle, North Dakota
Edward C. Murphy
2015
UNIT DESCRIPTIONS
Geology Undifferentiated
QUATERNARY SYSTEM
RECENT/PLEISTOCENE
Landslide Deposits
Other Features
Paved Road
Unpaved Road
MISSOURI
NATIONAL
GRASSLAND
Scale 1:24,000
Miles

How LiDAR is Collected



https://historicmappingcongress.files.wordpress.com/2012/06/lidar.jpg

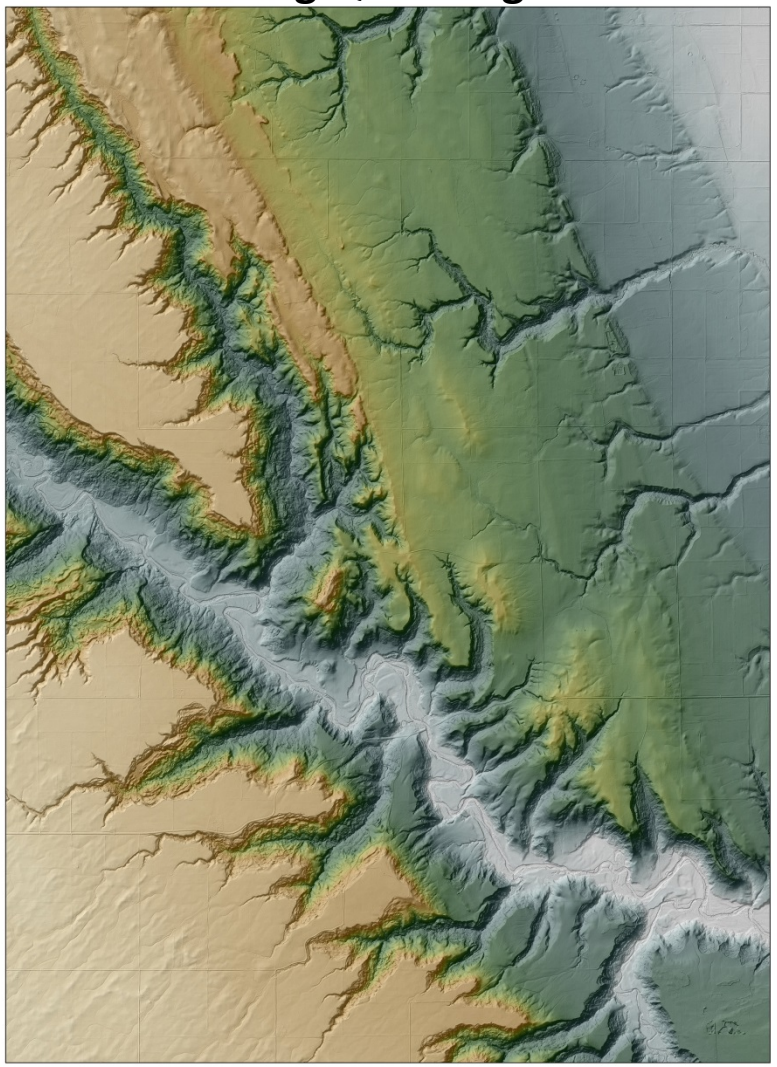
LIDAR 24K QUADRANGLES



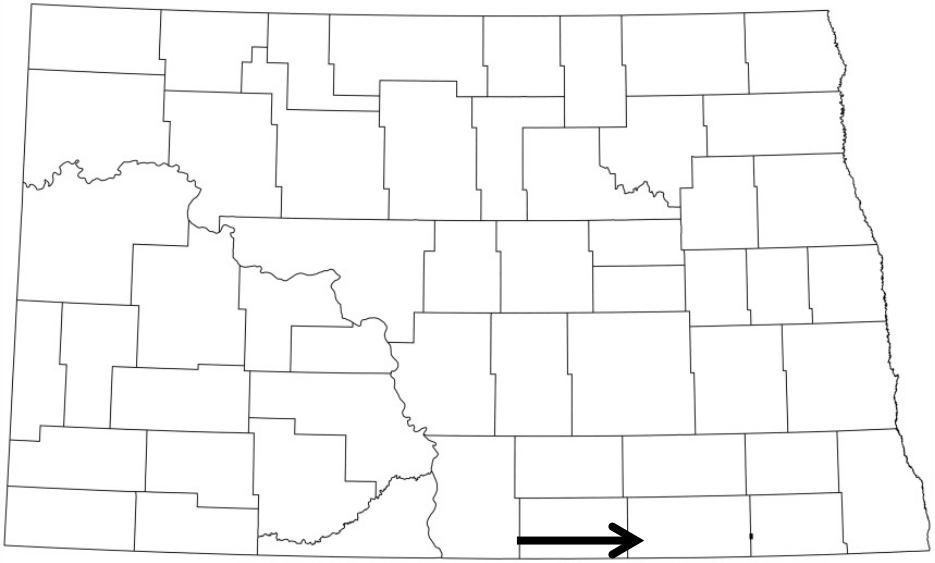
Maps compiled from data on NDSWC site.

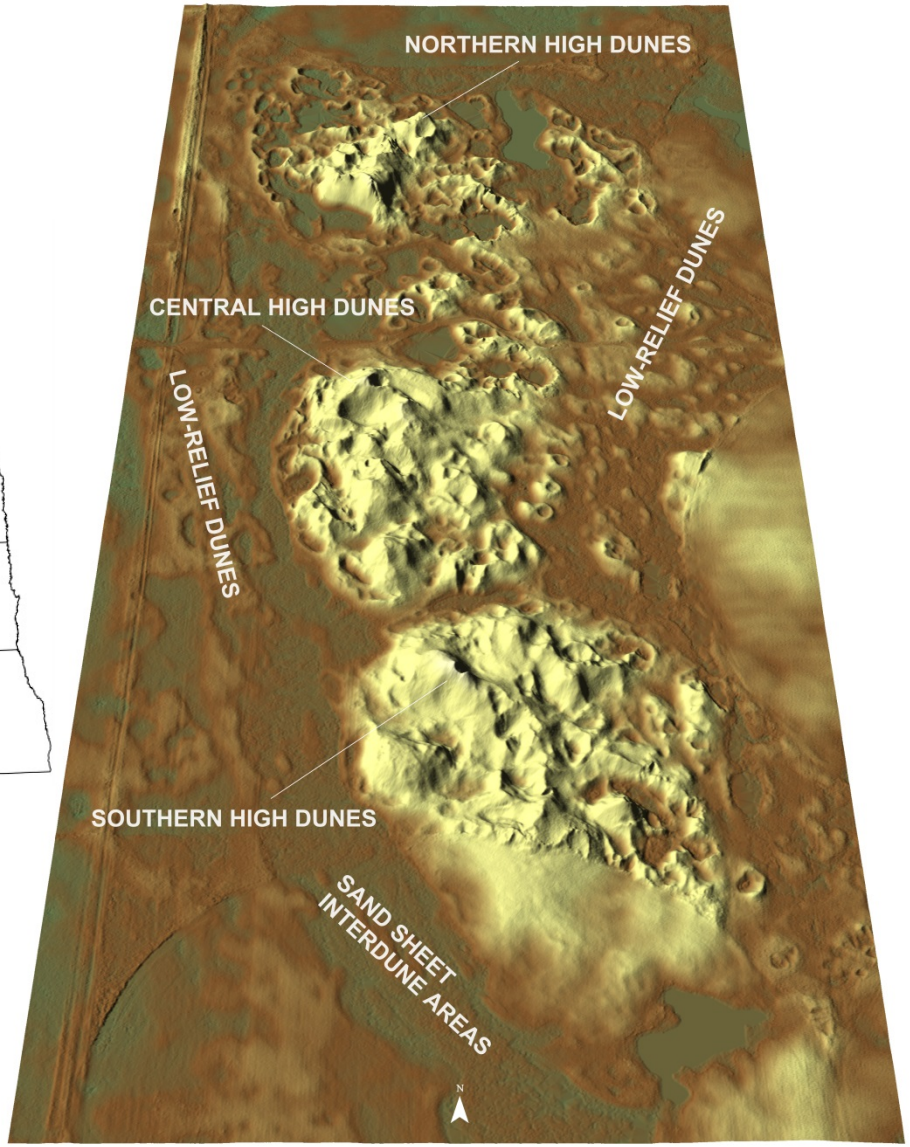
LIDAR 24K QUADRANGLE

Vang Quadrangle

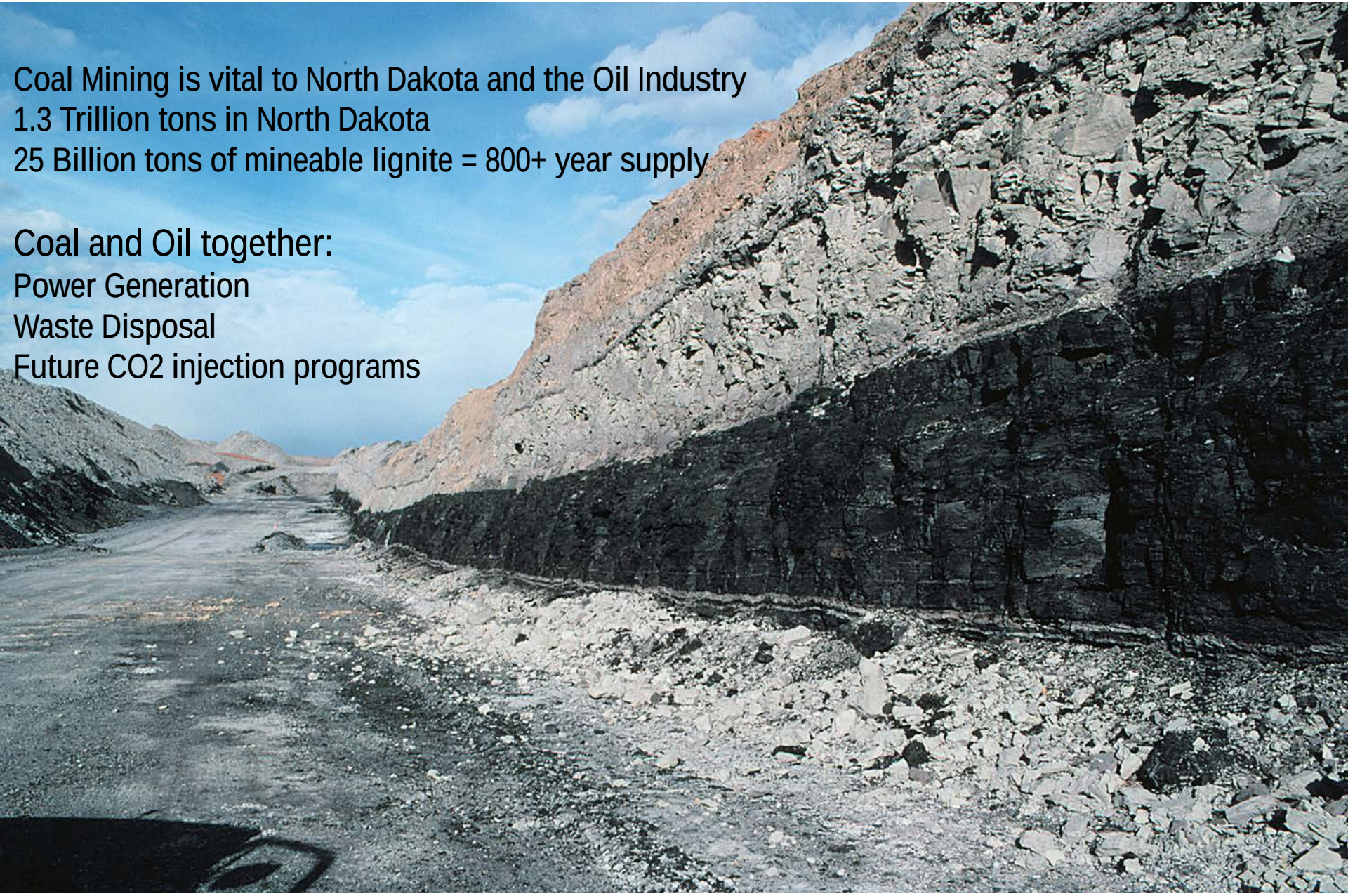


UTILIZING LIDAR

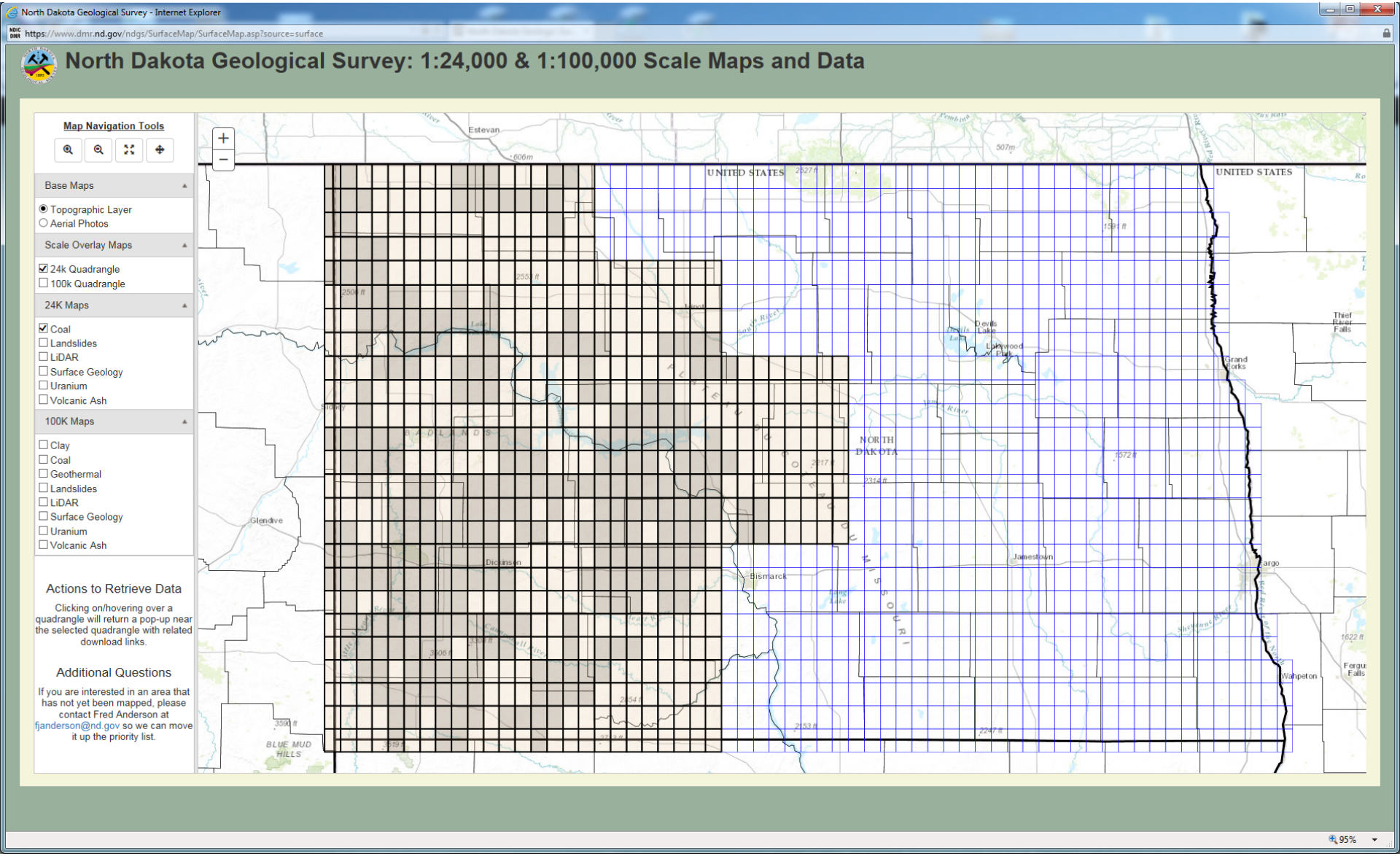




ENGINEERING & ENVIRONMENTAL INFRASTUCTURE REVIEWS

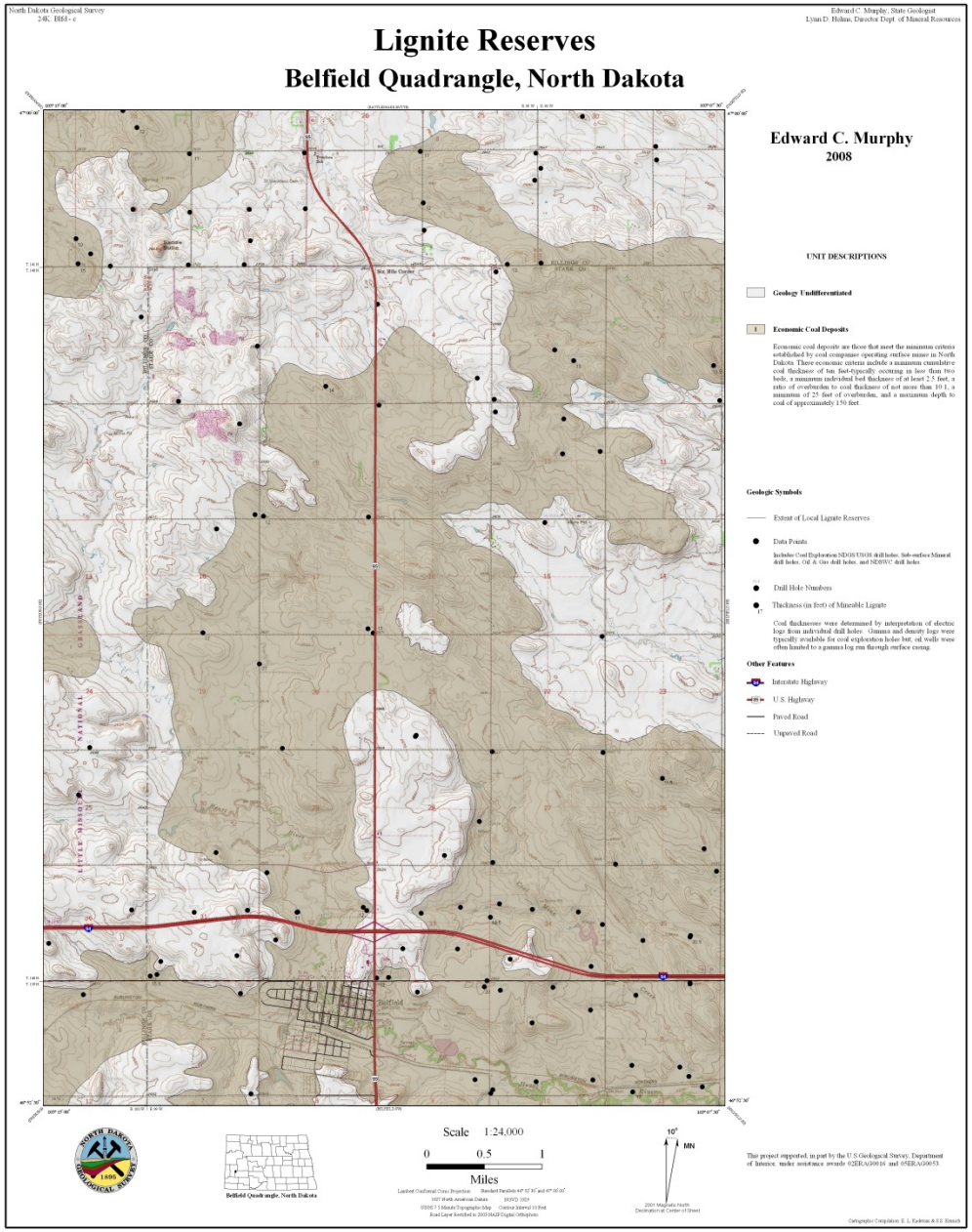

Coal Mining is vital to North Dakota and the Oil Industry
1.3 Trillion tons in North Dakota
25 Billion tons of mineable lignite = 800+ year supply
Coal and Oil together:
Power Generation
Waste Disposal
Future CO2 injection programs

ECONOMICALLY MINEABLE COAL DEPOSITS



ND was first state to complete mapping economic coal deposits at 24K.

ECONOMICALLY MINEABLE COAL DEPOSITS



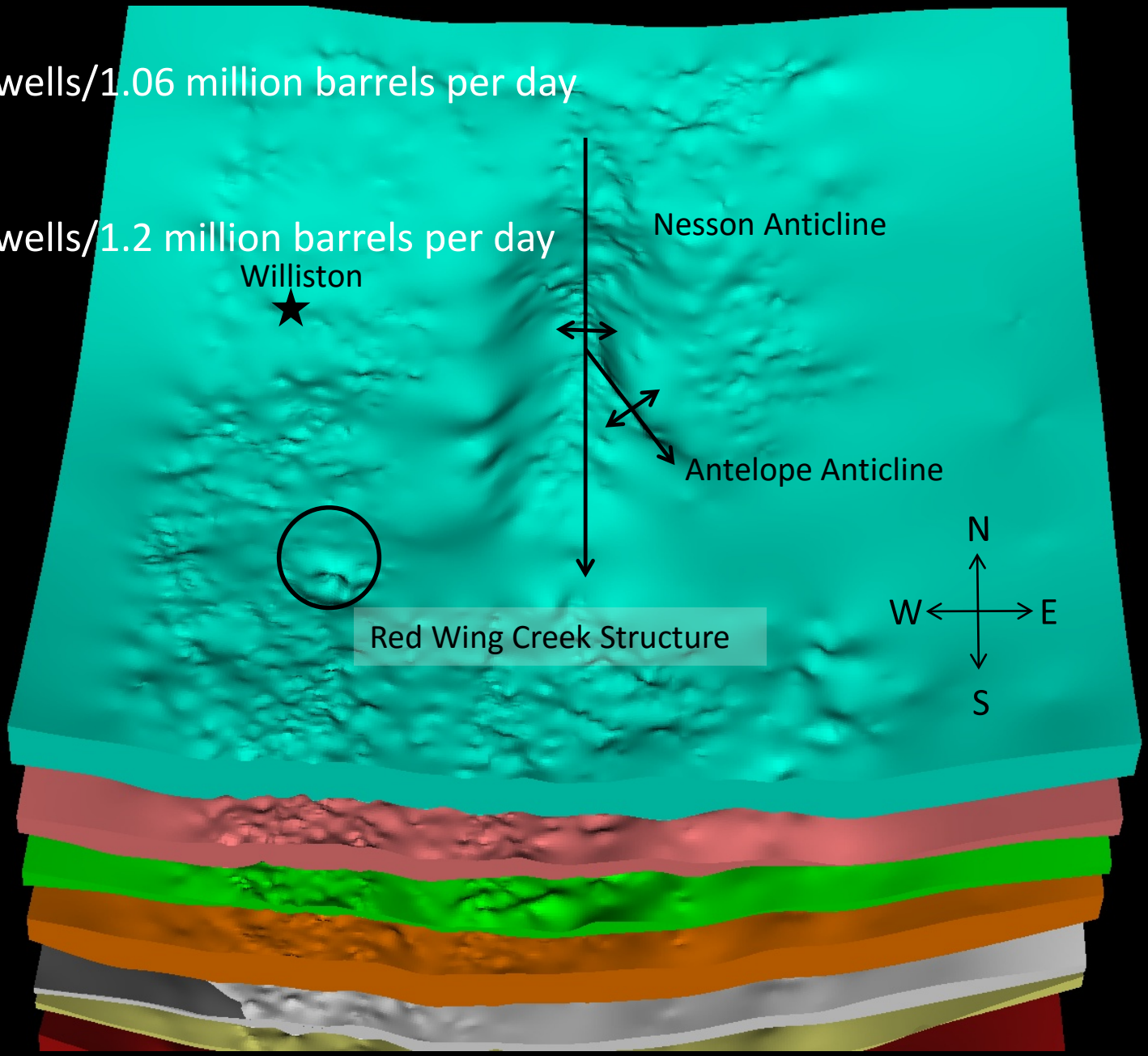
GEOTHERMAL SYSTEMS

Minnkota Power Cooperative Site in Grand Forks
646 Closed Loops: spaced 25 feet apart and 220 feet deep
February 2016

Dakota Group -Newcastle Fm. - Skull Creek Fm. - Inyan Kara Fm.

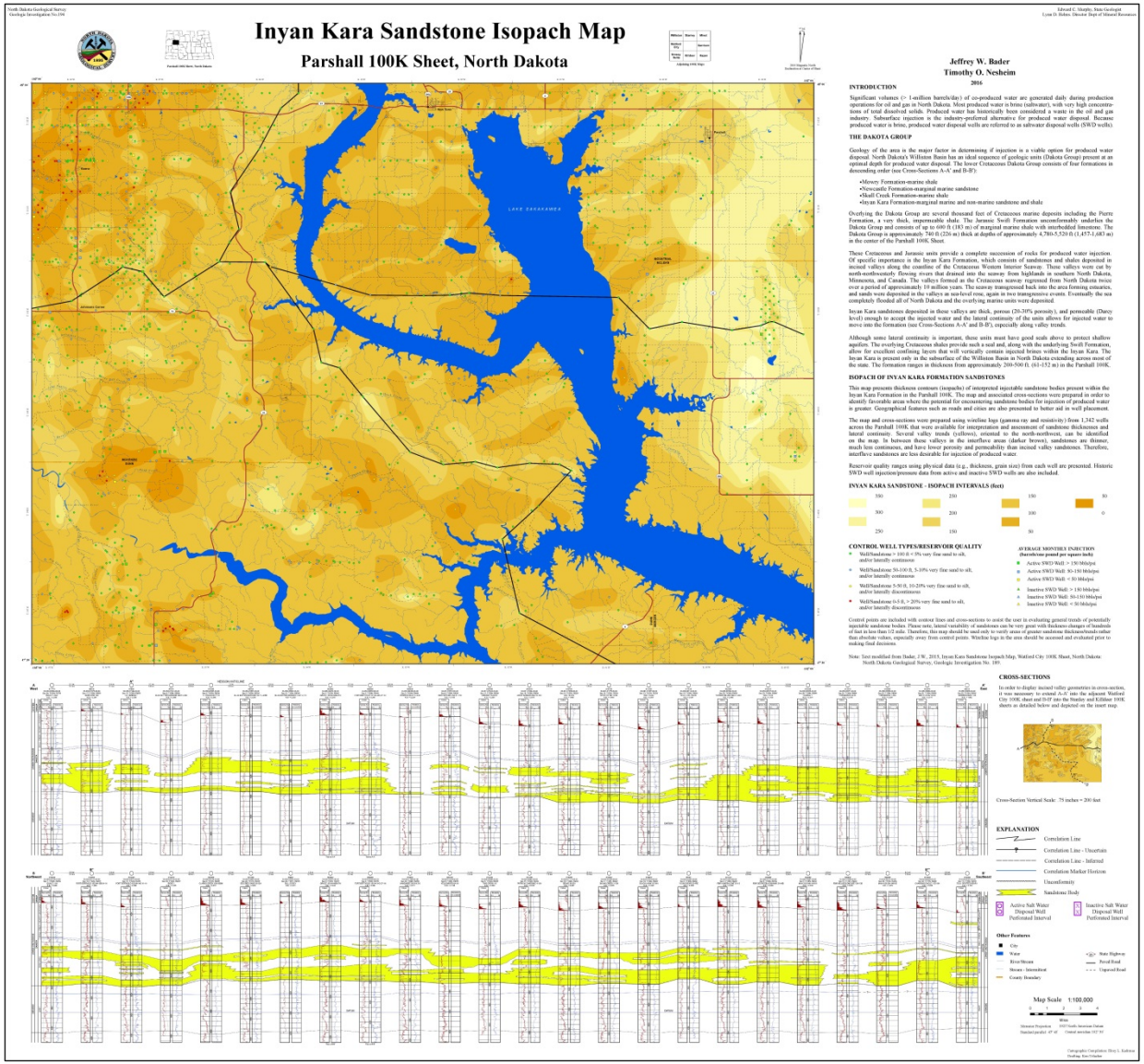
2014:
491 SWD wells/1.06 million barrels per day

2015:
501 SWD wells/1.2 million barrels per day

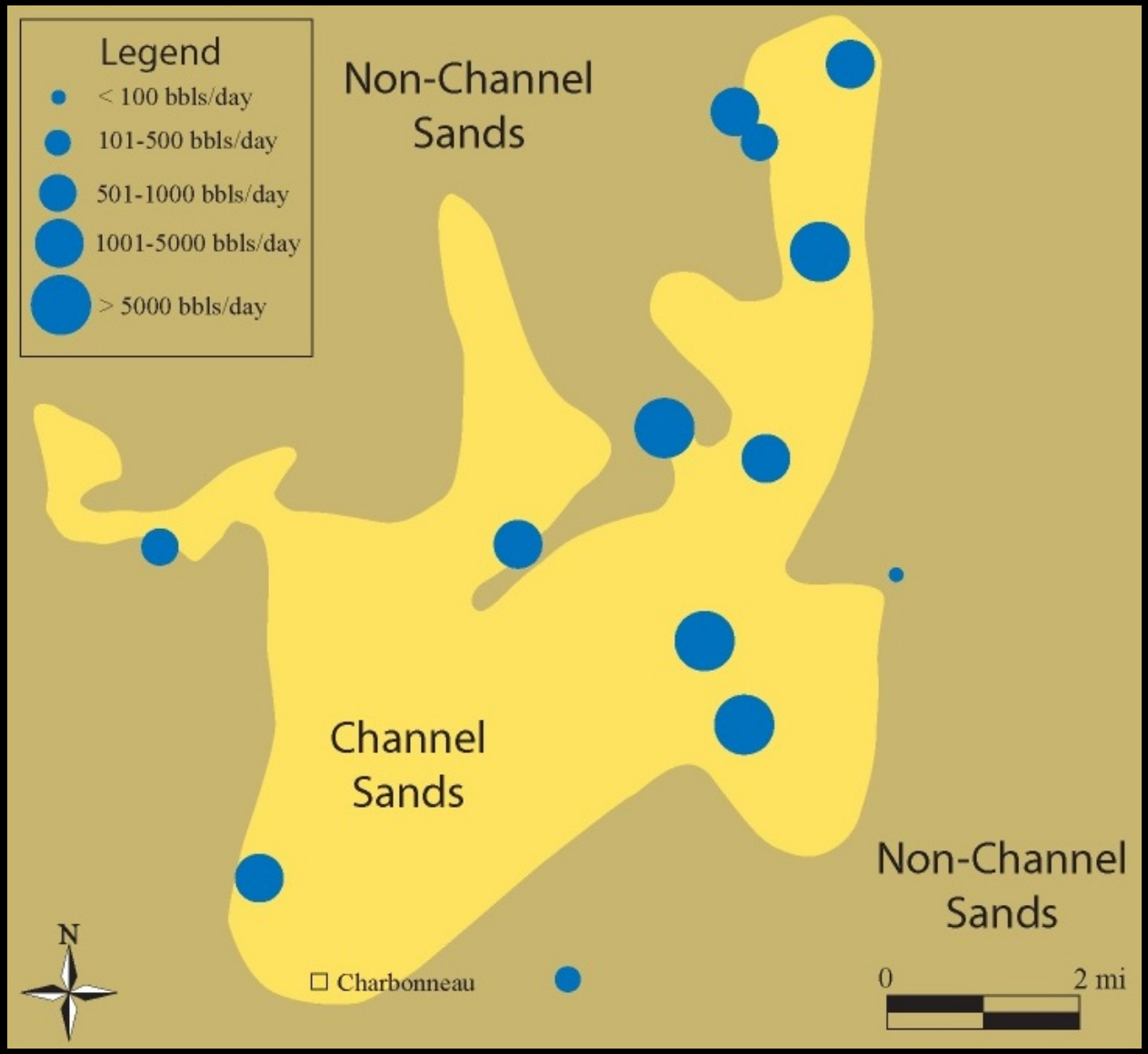


INYAN KARA FORMATION

Saltwater Disposal

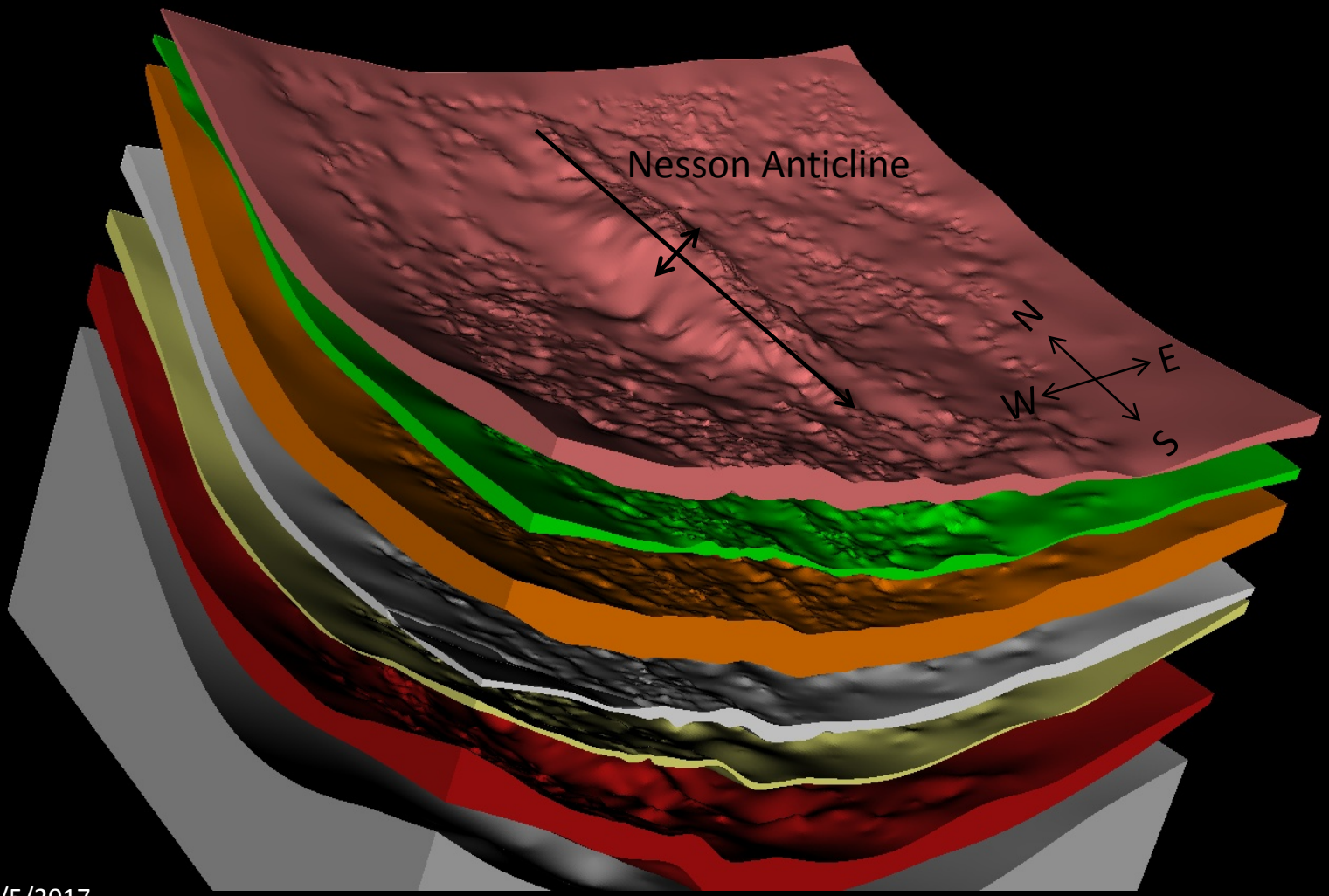


DISPOSAL WELLS



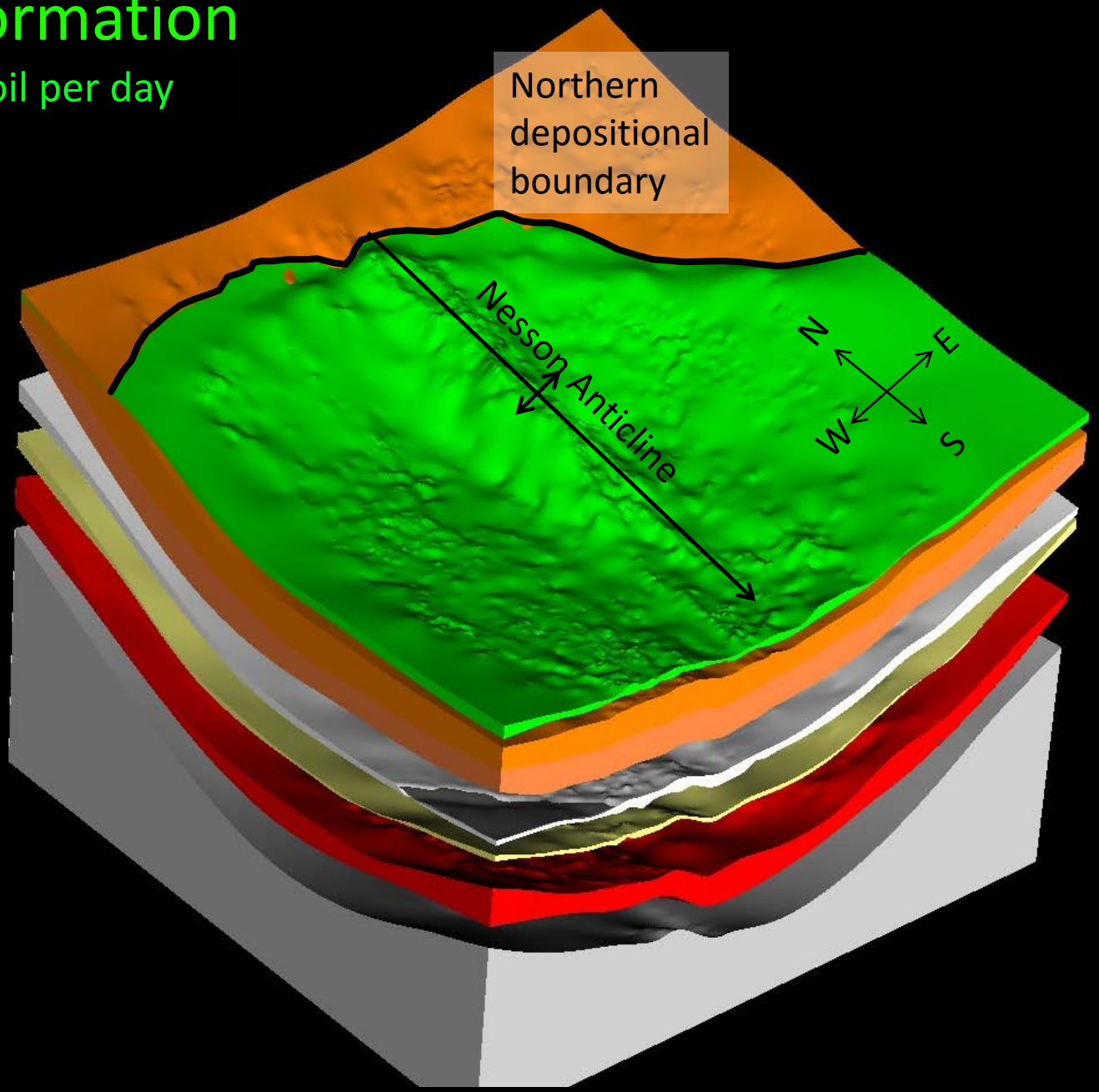
Spearfish Formation

2,200 Barrels oil per day



Tyler Formation

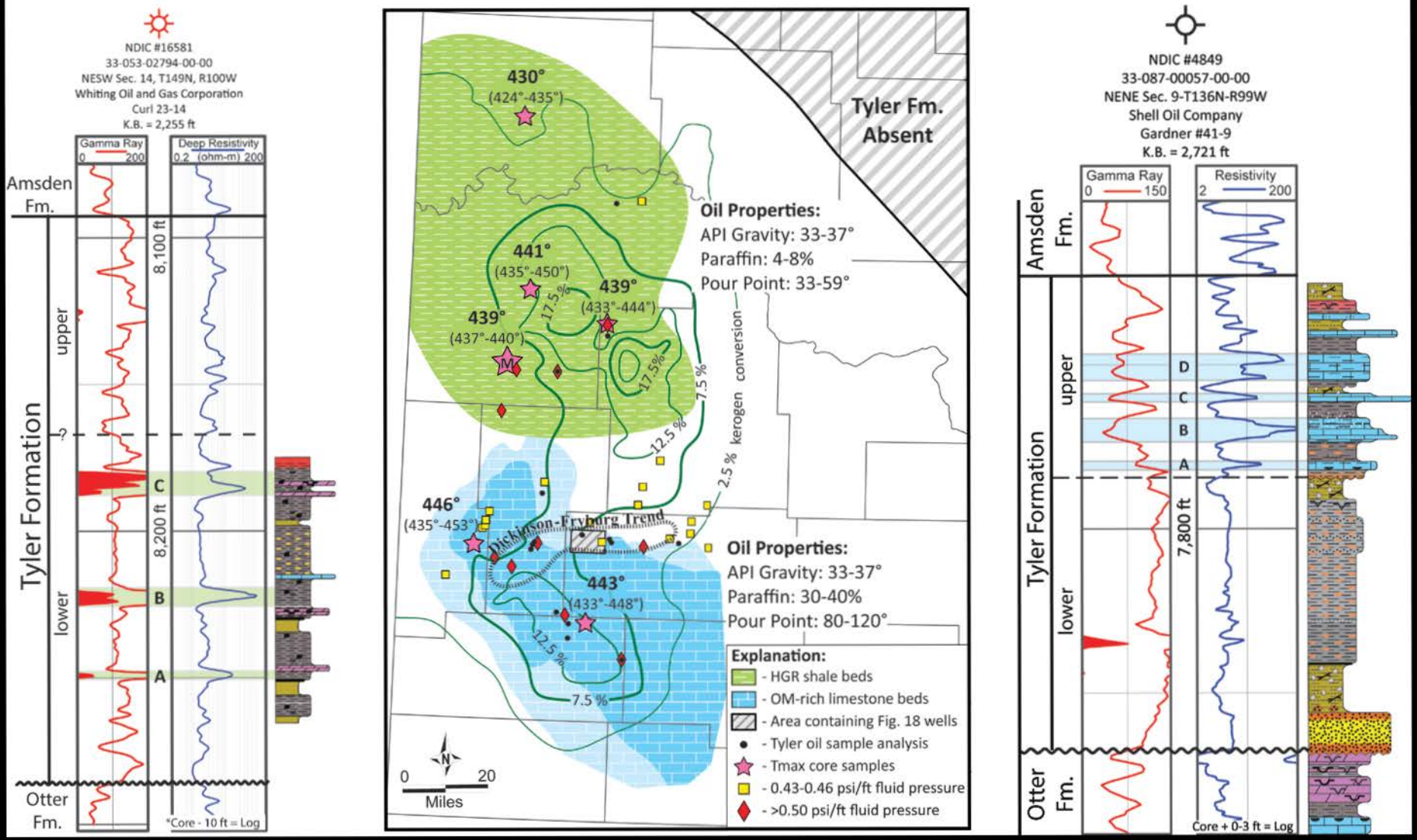
760 Barrels oil per day



Stratigraphy and Depositional Origin of Tyler Formation (Pennsylvanian) Source Beds in the Williston Basin, Western North Dakota

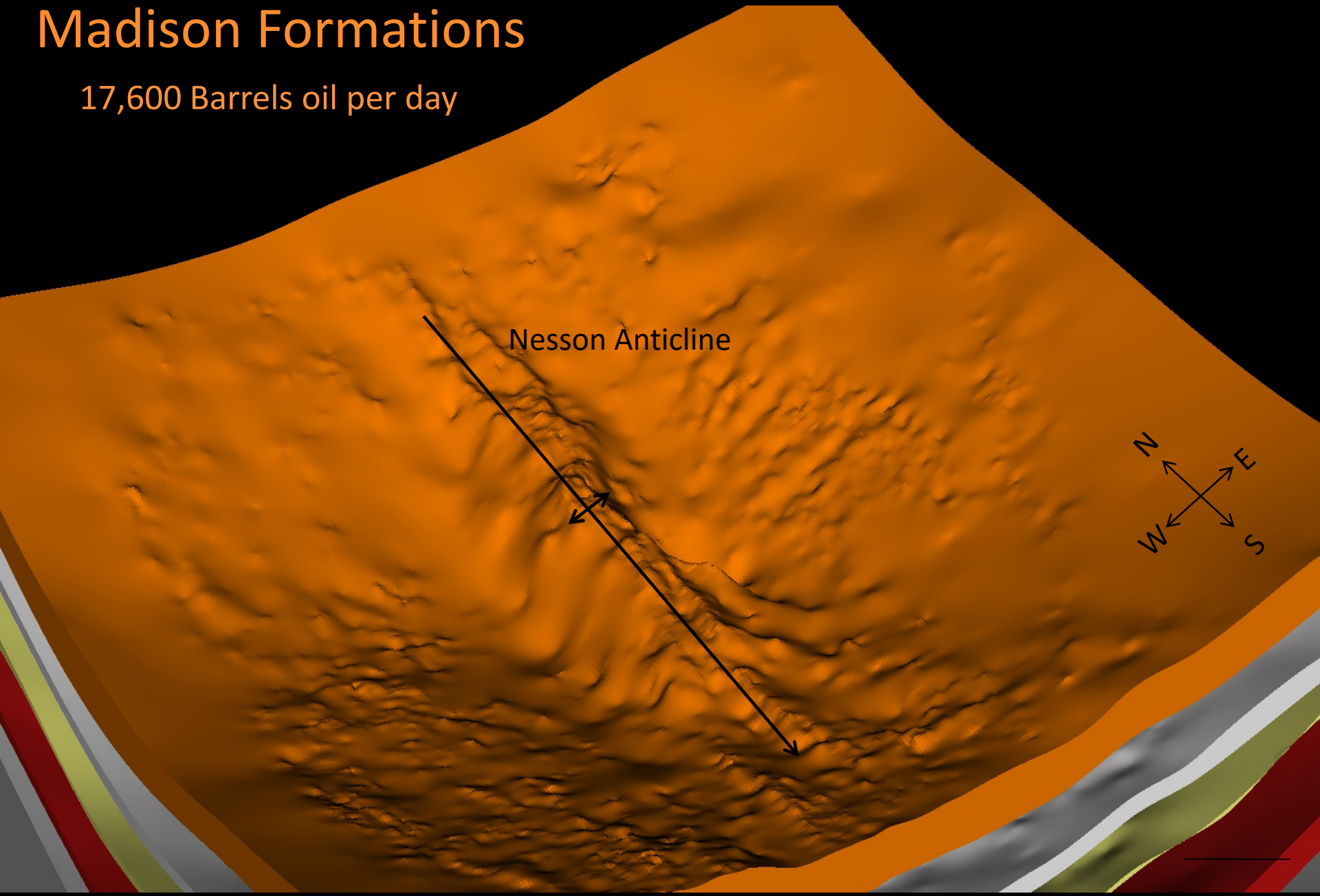
by Timothy O. Nesheim and Stephen H. Nordgeng

*Invited paper to a special volume publication put together by the Rocky Mountain Association of Geologists (RMAG)



Madison Formations

17,600 Barrels oil per day

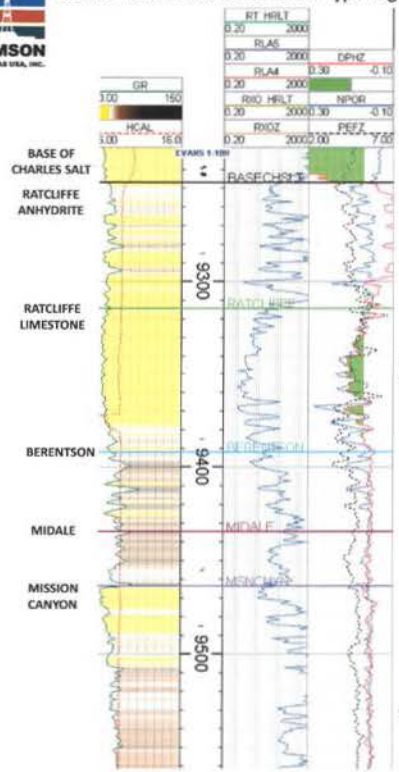


Samson Oil & Gas USA, Inc.
Requested 1920-acre Spacing Unit Plat – Madison Pool
Township 150N Range 102W
All of Sections 10-15-14
McKenzie County, North Dakota

T150N-R102W
Sections 10-15-14
Samson Oil & Gas W.I. = 93%
McKenzie County, ND

Samson Oil & Gas USA, Inc.
Exhibit: L-2
Docket Case No. 25291

Samson Oil & Gas Evans 1-10H Type Log (33-053-02623)



Samson Oil & Gas USA, Inc.
Exhibit: G-2
Docket Case No. 25291

Samson Oil & Gas USA, Inc.
Reserves & Economics Summary
Evans 1-10-15-14H Infill Well
Madison Pool
T150N R102W Sec. 10-15-14
McKenzie County, ND

Foreman Butte

RESERVES BASIS

Reservoir	Madison (Ratcliffe)	
True Vertical Depth	9,350' +/-	feet
Gross Thickness	67' (52.5' net > 4% porosity)	feet
Porosity	4-12%	%
Water Saturation	60-80%	%
Initial Rate	420	BOPD
Decline Rate	6.7	%
Exponent	1.3	b factor
Original GOR	708	SCF/BBL

Well Data INFILL WELL

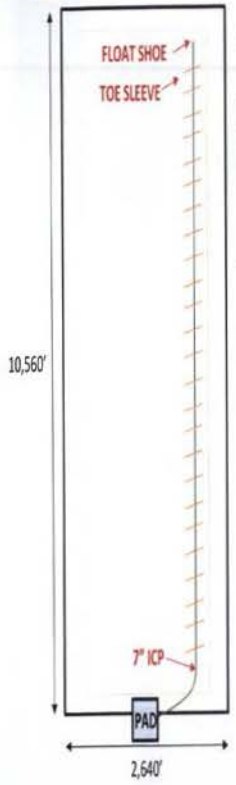
Lateral Length	11,500'	
Stimulation	none	

GROSS ECONOMICS INFILL WELL

Oil Price	42	$/bbl
Oil Differential	6.00	$/bbl
Gas Price	3.0	$/mcf
Drilling Costs	2,800	M$
Operating Costs	3416	$/month
Workovers	.20	M$
Working Interest	100	%
Revenue Interest	78	%
EUR Oil	350	MBO
EUR Gas	247	MMCF
PV@10%	2,937	M$
IRR	55	%
Payout	1.78	Years

Samson Oil & Gas USA, Inc.
Exhibit: E-2
Docket Case No. 25291

Completion Configuration – Stand-Up 640 Acre Unit



STANDARD DOWNHOLE CONFIGURATION

- Set 7" intermediate casing 50' within DSU (250' from section line)
- Terminate well 50' within DSU (250' from section line)
- 150' from float shoe (toe of well) to toe sliding sleeve (1st frac port)
- Last frac (heel) no closer than 100' from intermediate casing shoe

FRAC HALF LENGTH AND ORIENTATION

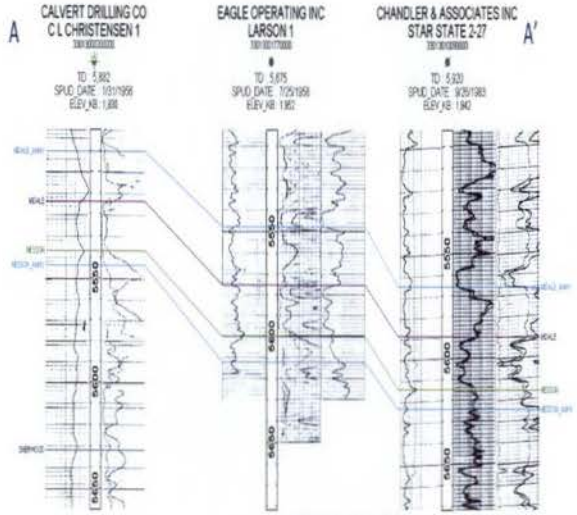
- Surface microsesimic conducted during hydraulic fracture operations on the Swenson 04H – Columbus Field
- Average maximum distance of microseismic events: 362'
- Reservoir simulation history matching indicates only 103' of propped half length
- Average Orientation of Microseismic Events: 79° NE-SW

INDUSTRIAL COMMISSION
STATE OF NORTH DAKOTA
DATE 10-18-16 CASE NO. 25307
Introduced By Petro-Harvester
Exhibit 7
Identified By Radovanovic

Exhibit 7

8

Cross Section – Midale/Nesson – Case No. 25307
Sec. 15 & 22 [T163N – 90W]



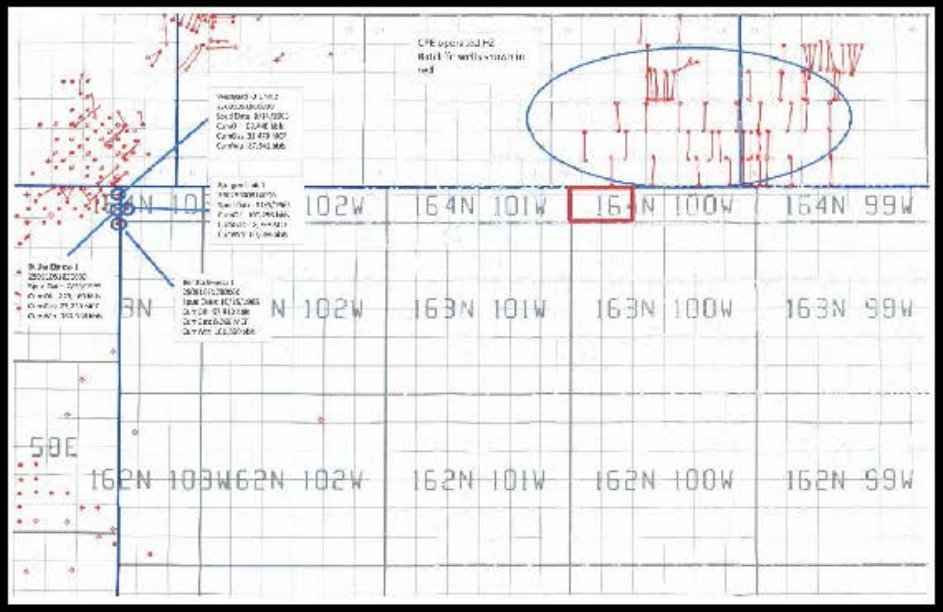
INDUSTRIAL COMMISSION
STATE OF NORTH DAKOTA
DATE 10-18-16 CASE NO. 25307
Introduced By Petro-Harvester
Exhibit 5
Identified By Radovanovic

Exhibit 5

6

Madison Pooling Hearing
North Dakota Industrial Commission
Stony Run Madison Field Spacing
Madison Reservoir Data Sheet

Location	Section 15 & 22 T163N 90W Burke County, ND	
Drilling Unit	640	acres
TVD	5,550	ft
Net Thickness	24	feet
Porosity	0.13	fraction
Oil Saturation	0.45	fraction
Oil Gravity	39	° API
Bottom Hole Temperature	165	° F
Gas-Oil Ratio	1,000	scf/bbl
Gas Properties	0.9	specific gravity
Reservoir Pressure	2382	psia
Oil Formation Volume Factor	1.4	b/b
Oil-In-Place Spacing Unit	4,979	mbo
Single well EUR Model	480	mbo
Wells Required for Spacing Unit	2	well count
Unit Recoverable Reserves	960	mbo
Recovery Factor	0.19	fraction
Well Cost (Single Well D&C)	3.8	$MM
Well Economics	44%	ROR
	2.5	Years Payout



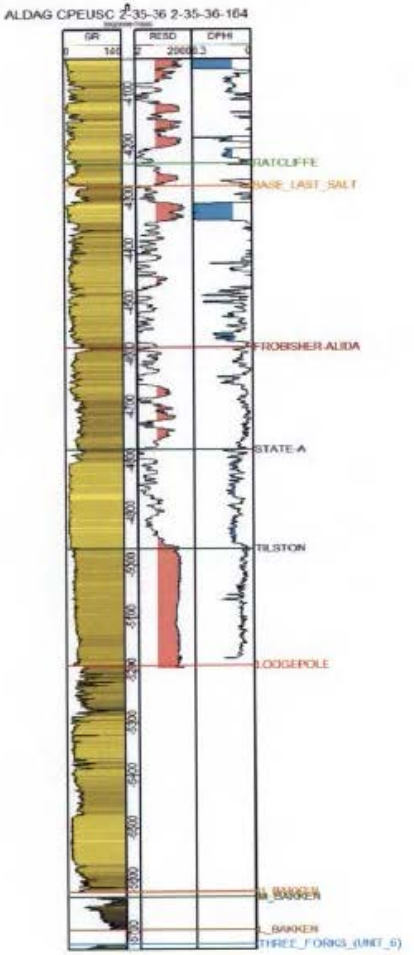
Case No. 25500

Ratcliffe Economics

Economics	Ratcliffe	
OOIP	4,207,841	mstb/1,562 acre drilling unit
Primary Recovery Factor (5x well/1562 acre DSU)	17.8	% of OOIP
Estimated Ultimate Recovery - Oil (gross)	150,000	stb
Royalty and Overrides	18.75	%
WTI Oil Price (2016) - Flat 2016+	$ 50.00	/bbl
Gas Price (2016) - Flat 2016+	$ 2.50	/mcf
Net Present Value (Discounted 10% - BT)	$ 872,200	
Production and Extraction Taxes	$ 334,000	
Operating Cost	$ 1,056,000	
Net Income	$ 2,574,600	
Investment	$ 1,400,000	
Rate of Return	83%	
Payout (years)	1.1	

Case No. 25500

Reference Log



Crescent Point ENERGY U.S. CORP

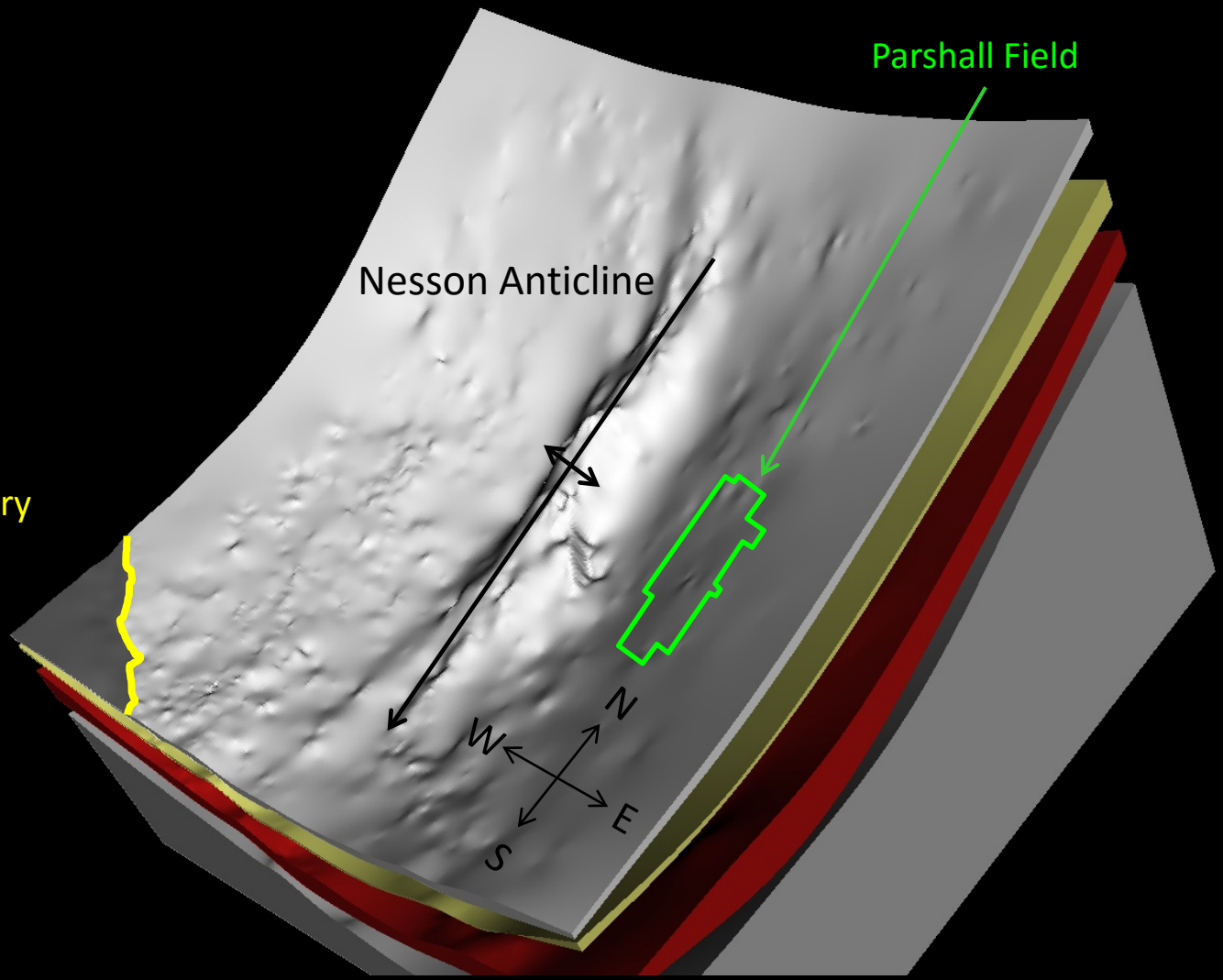
INDUSTRIAL COMMISSION
STATE OF NORTH DAKOTA
DATE 12-15-16 CASE NO. 25500
Introduced By Crescent Point
Exhibit G-2
Identified By Johnson

Bakken-Three Forks

-Bakken Fm. (light grey)

-Three Forks Fm. (dark grey)

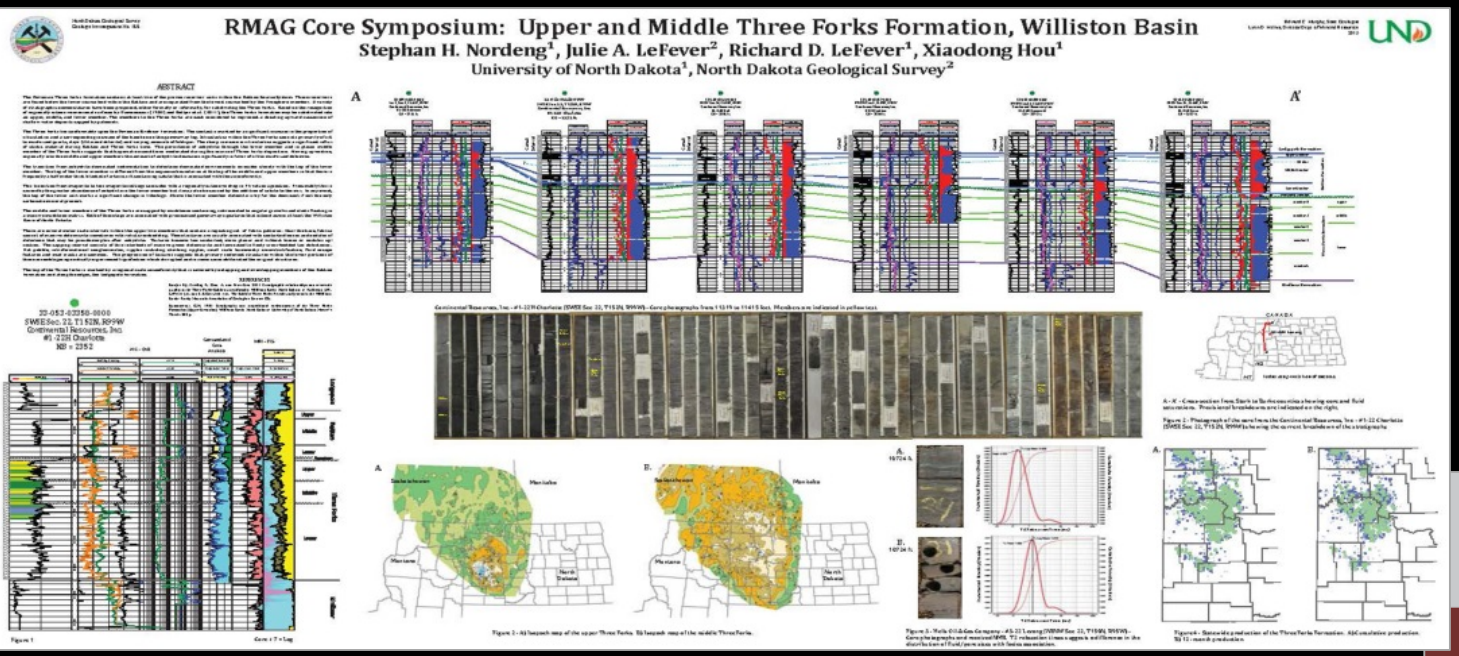
1.04 million barrels oil per day



Bakken Limit

-Depositional Boundary

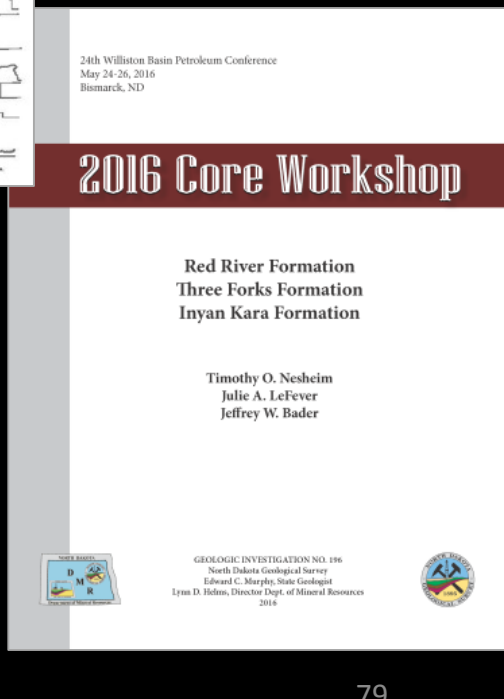
BAKKEN AND THREE FORKS CORE WORKSHOPS



RMAG Core Symposium: Upper and Middle Three Forks Formation, Williston Basin

Stephan H. Nordeng[1], Julie A. LeFever[2], Richard D. LeFever[1], Xiaodong Hou[1]
University of North Dakota[1], North Dakota Geological Survey[2]

ABSTRACT



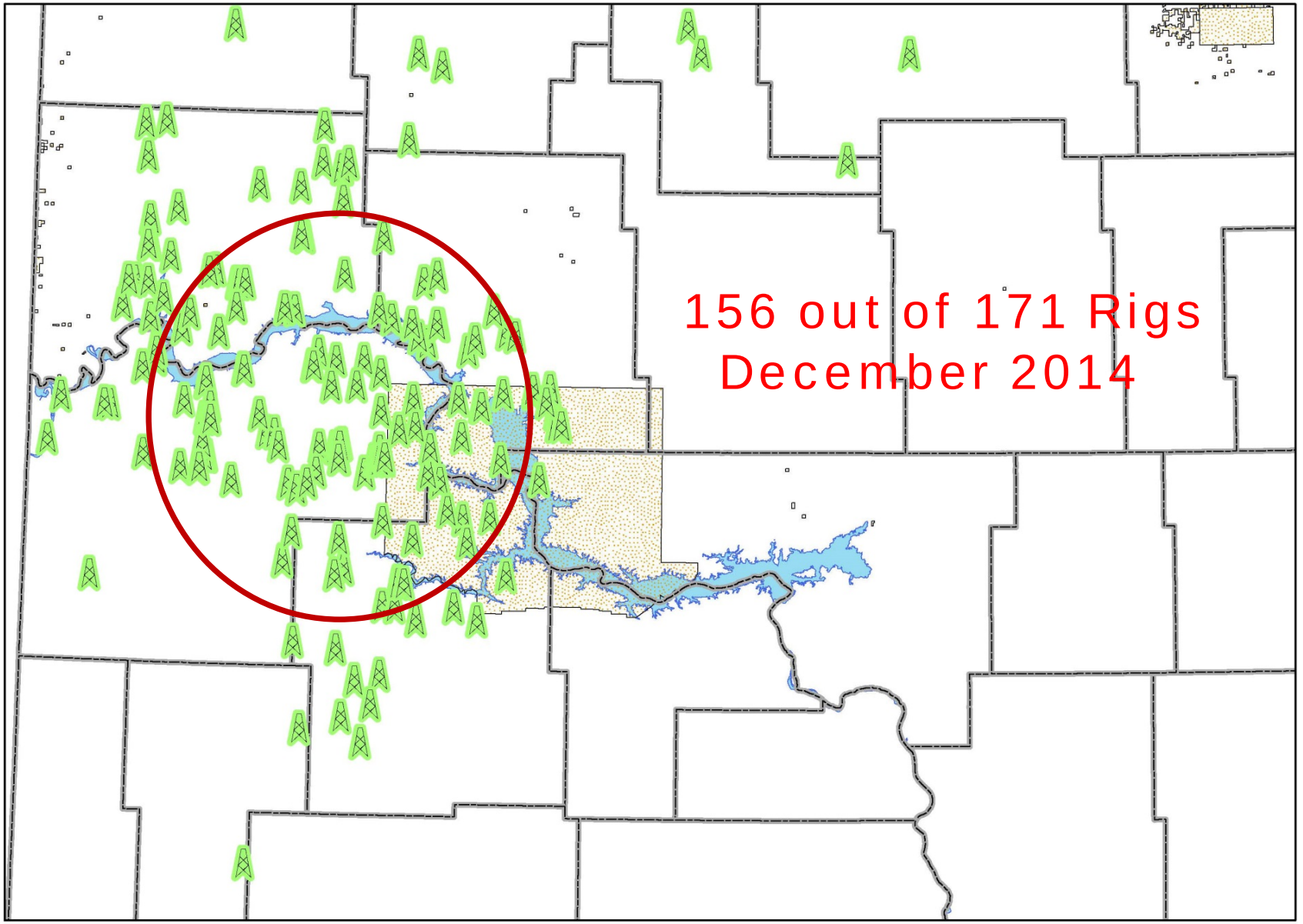
24th Williston Basin Petroleum Conference
May 24-26, 2016
Bismarck, ND

2016 Core Workshop

Red River Formation
Three Forks Formation
Inyan Kara Formation

Timothy O. Nesheim
Julie A. LeFever
Jeffrey W. Bader

GEOLOGIC INVESTIGATION NO. 196
North Dakota Geological Survey
Edward C. Murphy, State Geologist
Lynn D. Helms, Director Dept. of Mineral Resources
2016



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Prepared by N.D.I.C.
Oil and Gas Division
12/23/2014
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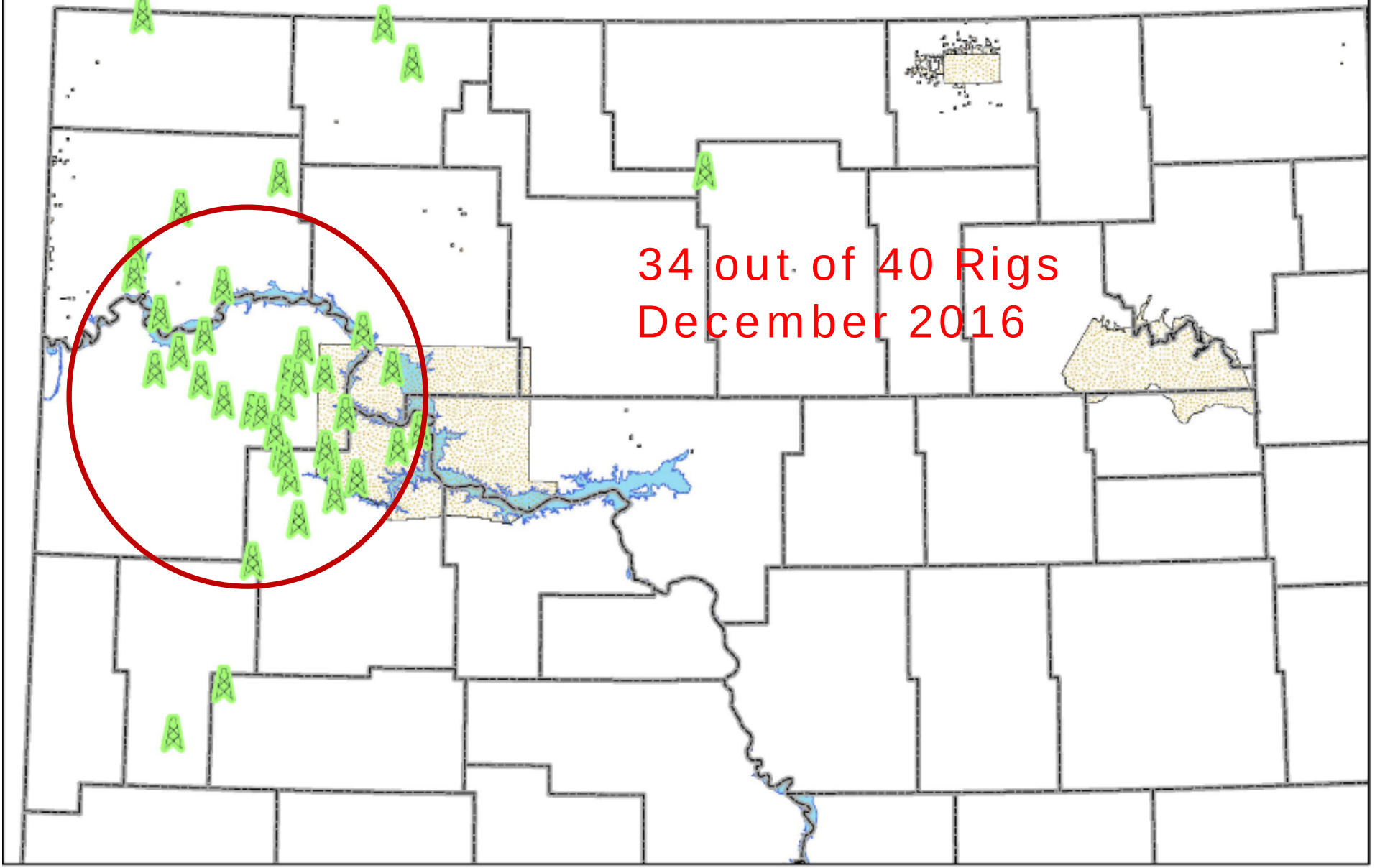

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0 20 40 80 Miles

Prepared by N.D.I.C. Oil and Gas Division
12/29/2016
10:14:22 AM

	3Q 2016					
Current	Breakeven			Wells		
$54	WTI $/BO	Rigs	Sep-16	NC	P90	P50
Billings	$47*	0	627	5	1,900	2,500
Bottineau-Renville	+$100*	0	1,033	2	3,000	4,000
Bowman-Slope	+$100*	0	540	0	900	1,200
Burke	$78	1	628	2	1,300	3,000
Divide	$84	1	802	48	3,000	5,000
Dunn	$17	10	1,933	128	4,800	9,000
Golden Valley	$78*	1	102	1	250	300
McKenzie	$20	12	4,028	360	7,100	15,000
McLean	$18	1	59	4	800	1,200
Mountrail	$33	4	2,635	187	4,800	9,000
Stark	$29	0	277	4	2,900	3,500
Williams	$28	4	2,427	146	5,500	10,000
Statewide	$24	34	15,130	887	36,250	63,700
* Information from previous quarter, too little data to calculate new value						

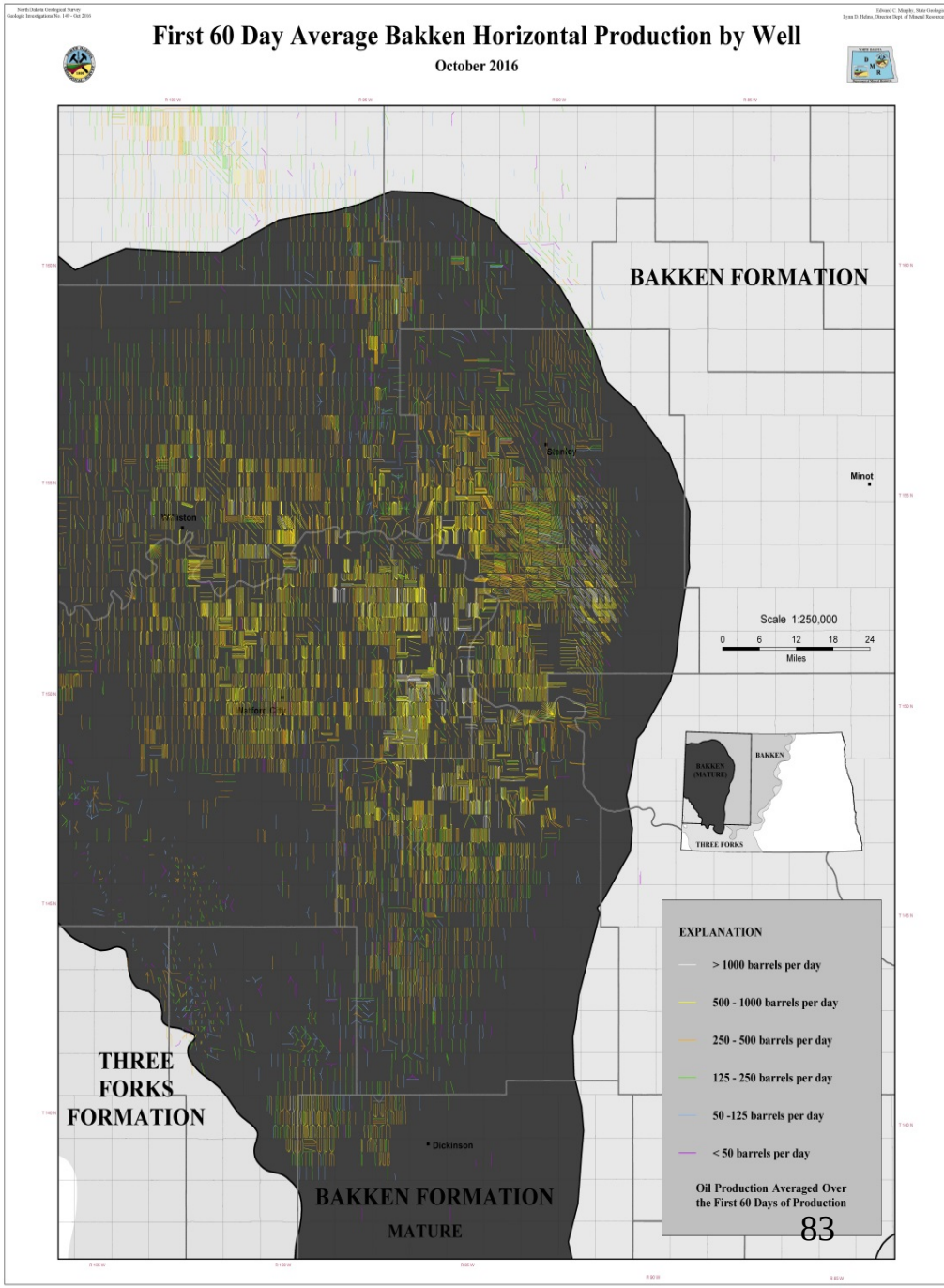
Wells
13,457 active
2,133 conventional
11,324 Bakken/Three Forks
1,503 inactive
+$40 for 90 days
860 waiting on completion
+$50 for 90 days

1,912 permitted
+$60 for 90 days

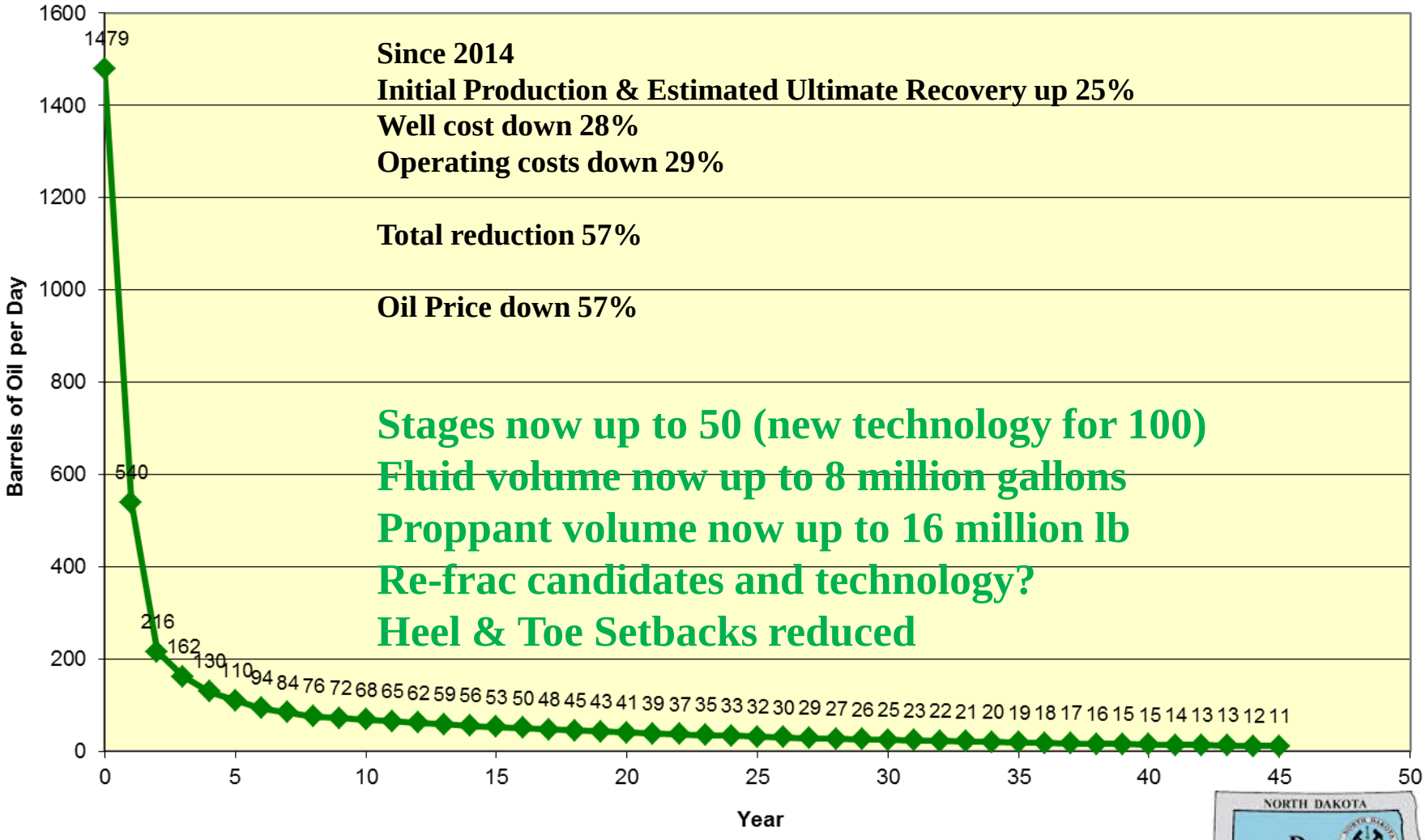
13,711 increased density approved
31,443 total

55,000-65,000 estimated final

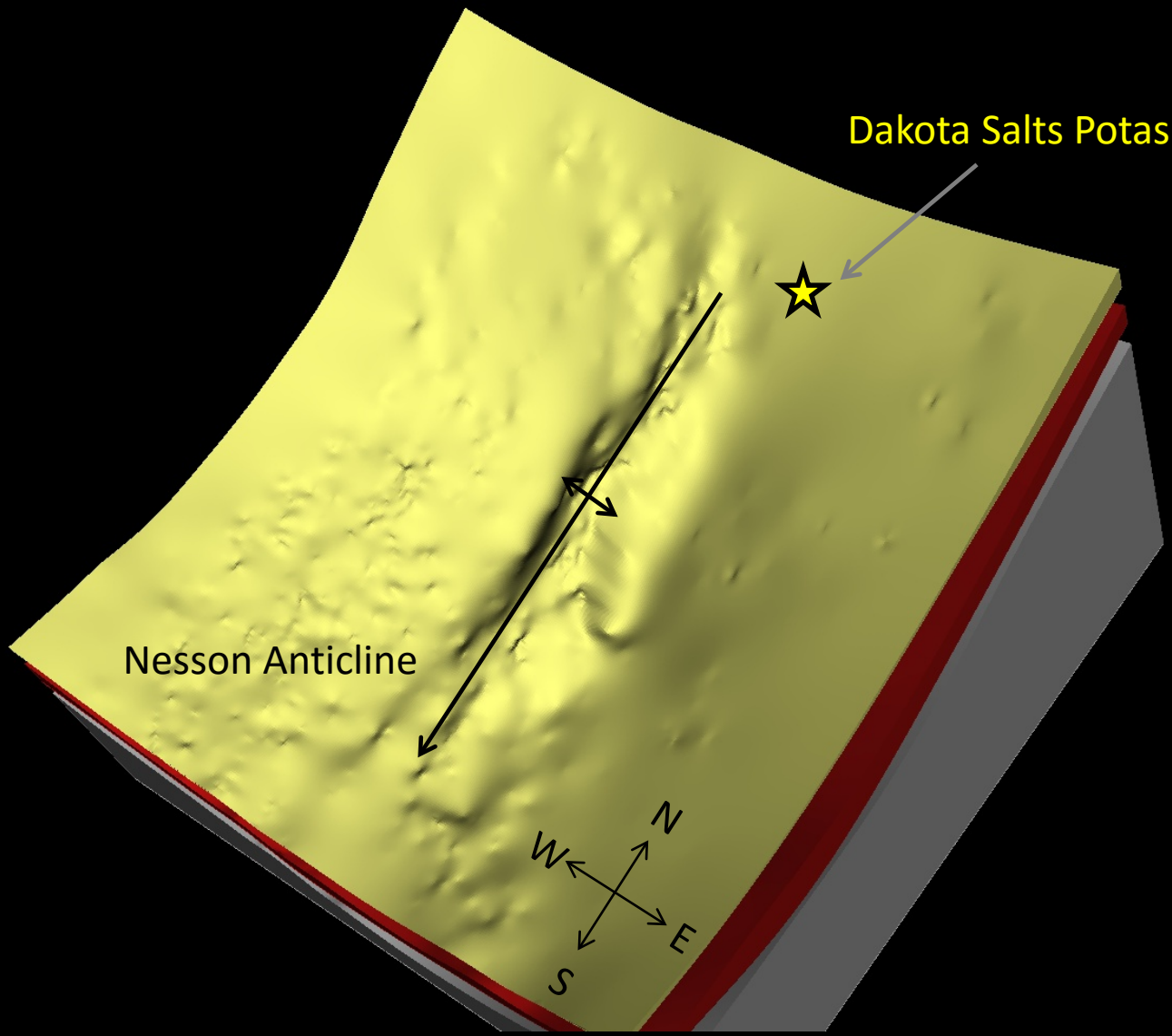
10,281 reclaimed and bond released
1,327 reclamation in progress



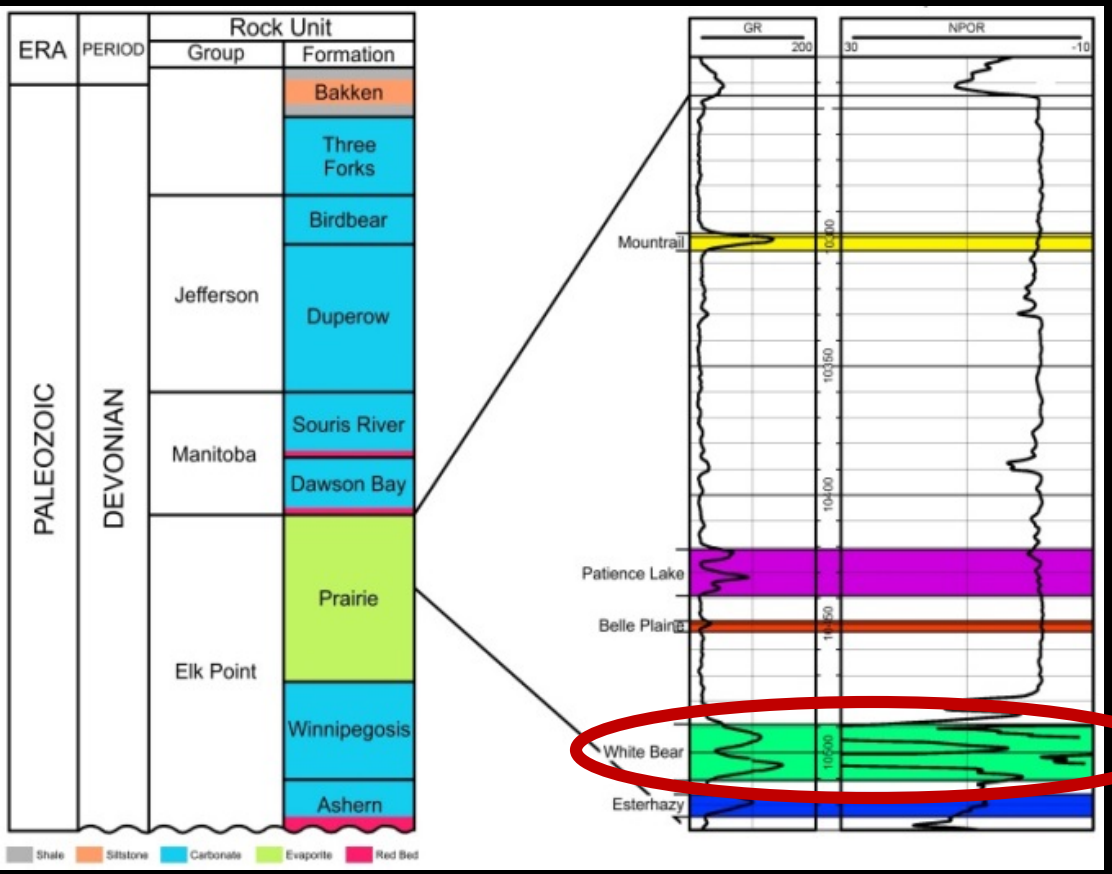
Typical Bakken Well Production

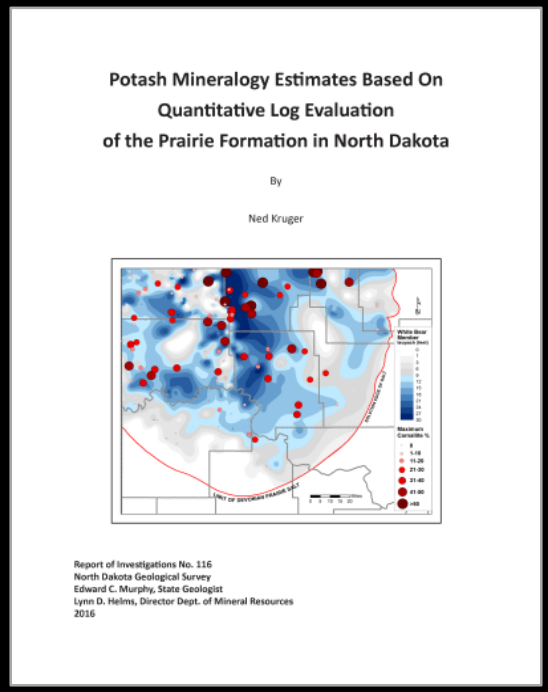


Prairie Formation



POTASH



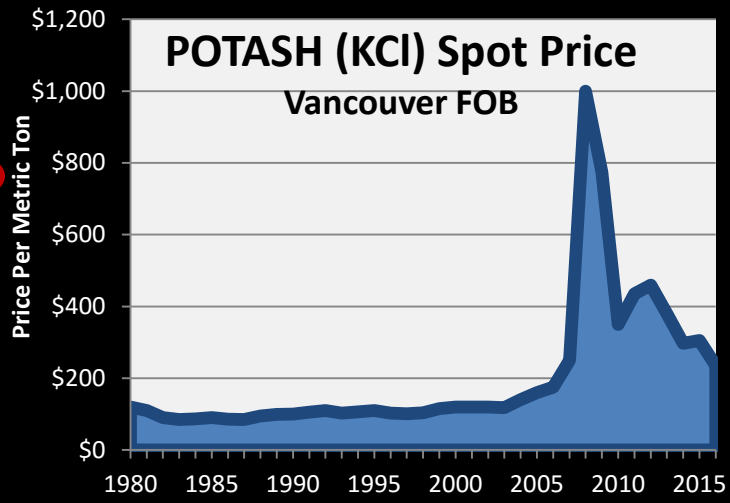


Potash Mineralogy Estimates Based On
Quantitative Log Evaluation
of the Prairie Formation in North Dakota

By

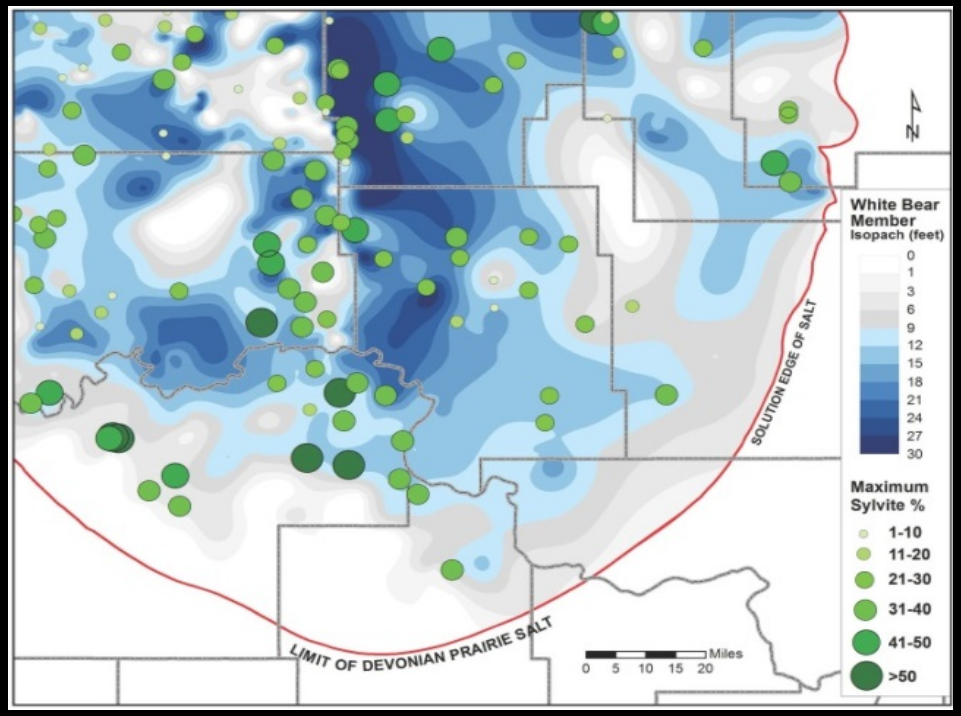
Ned Kruger

Report of Investigations No. 116
North Dakota Geological Survey
Edward C. Murphy, State Geologist
Lynn D. Helms, Director Dept. of Mineral Resources
2016

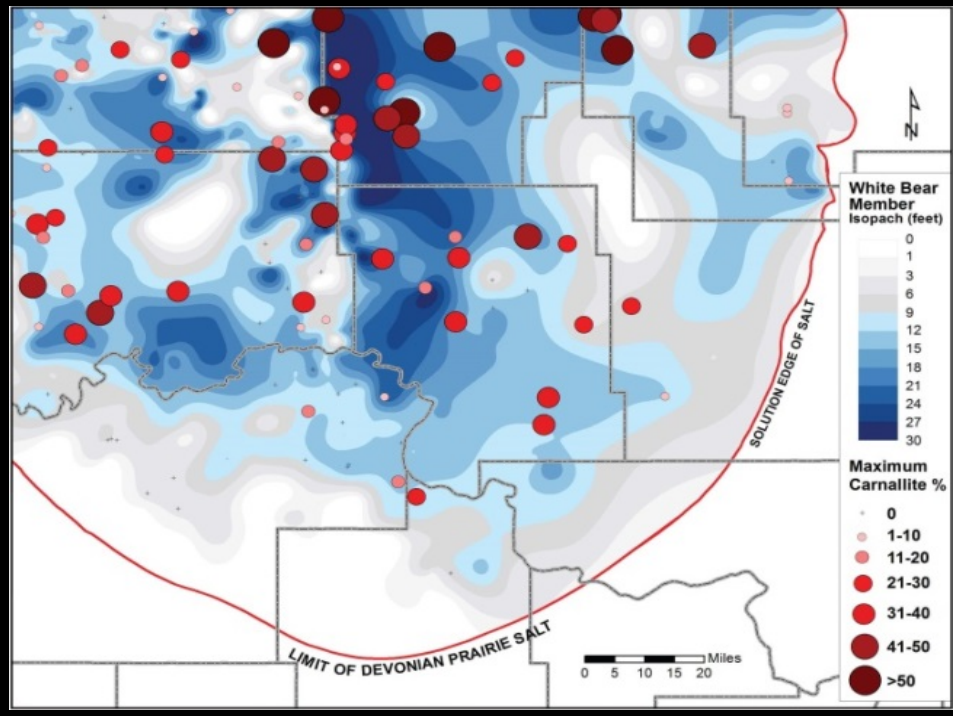


POTASH

WHITE BEAR MEMBER



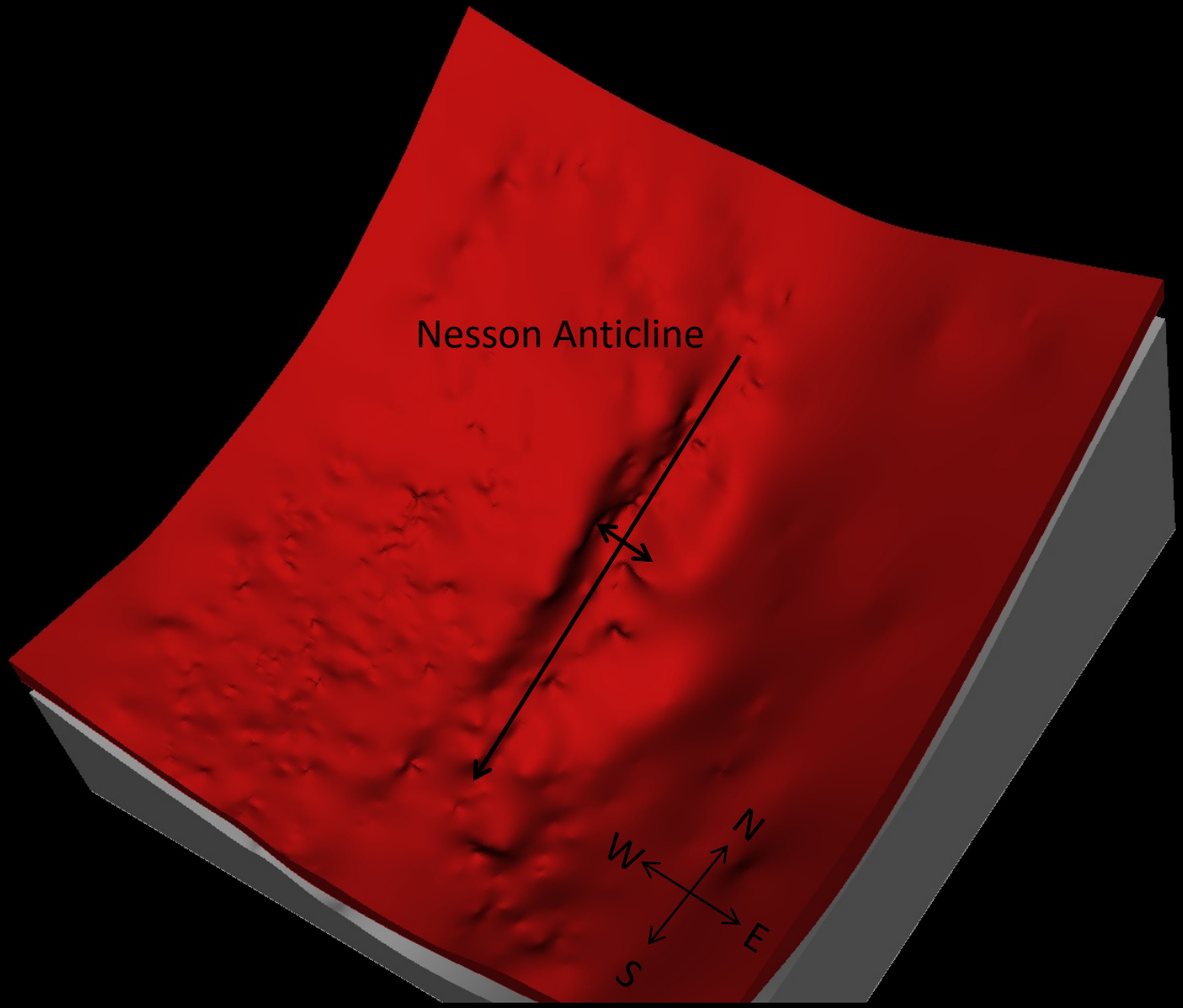
SYLVITE (KCl)



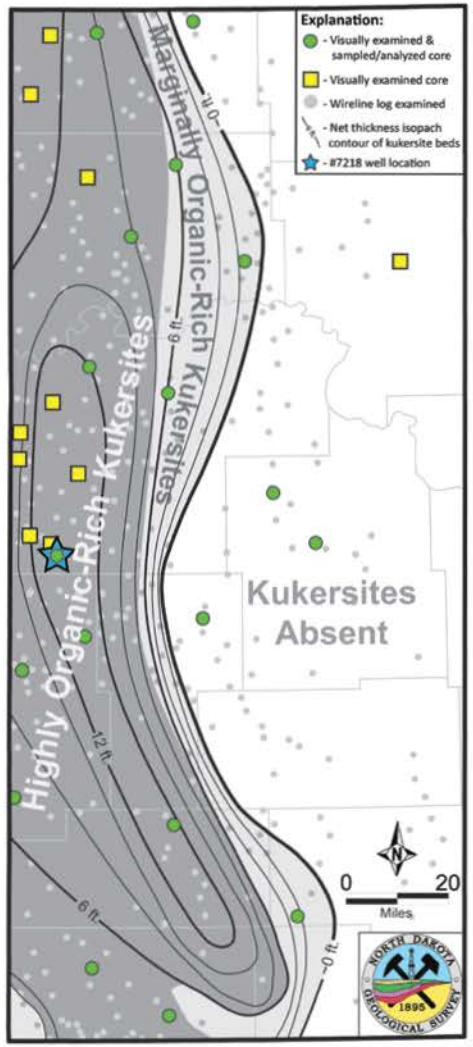
CARNALLITE ($KMgCl_3$-$6H_2O$)

Red River Formation

20,300 Barrels oil per day



Red River Formation Source Beds and Thermal Maturity



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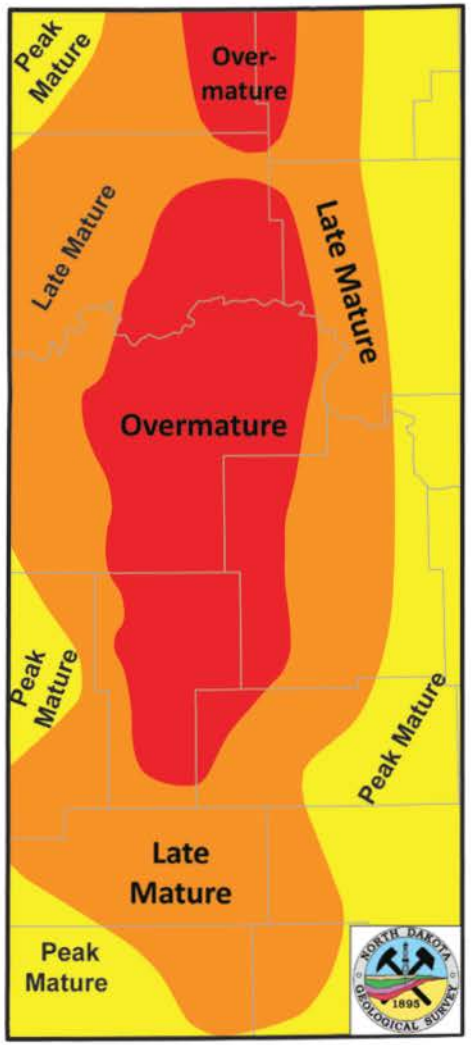

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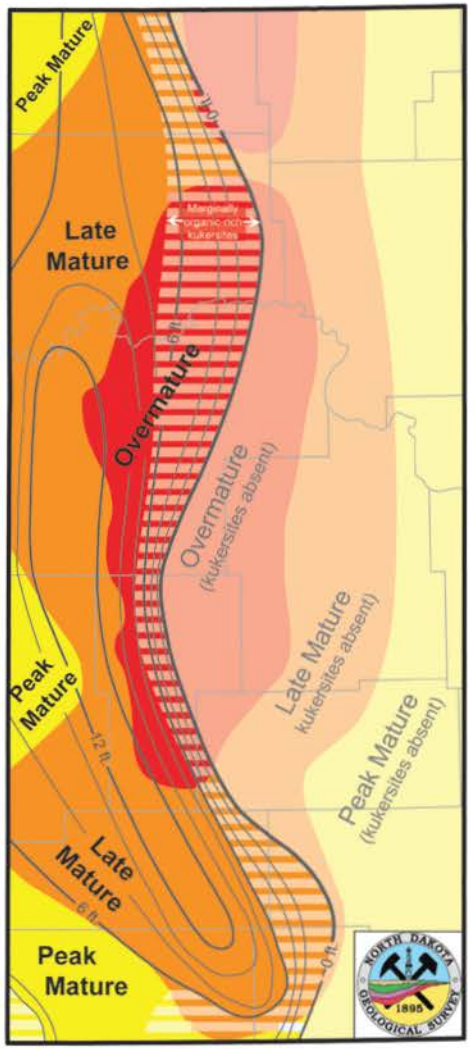


Red River Formation Source Beds and Thermal Maturity

Equation (modified from Schmoker, 1994)

mass of original organic carbon (grams of TOC) | HC generated per gram TOC | conversion to bbls oil

$$\frac{TOC_o}{100} \times \rho \times A \times T \times \left[HI_o - HI_{pd}\right] \times \frac{1}{C}$$

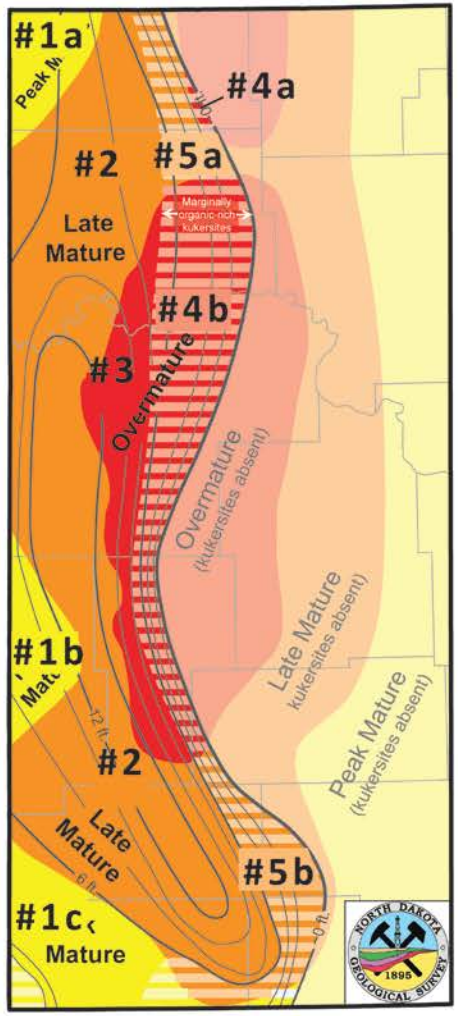
(wt. %) g/cm^3 cm^3 mg HC/g TOC

TOC_o = original total organic carbon
ρ = formation density
A = area of source rock unit
T = average source rock net thickness
HI_o = original hydrogen index
HI_{pd} = present day hydrogen index
*C = 1.3514×10^8 mg/barrel of 35° API oil
HC = hydrocarbons

*C was calculated assuming 850 kg/m^3 = 35° API oil density, and 1 barrel oil = 6.2898 m^3

Fig. X Area	A (cm2 x 10E-	T	TOCo	HIo	HIpd	ρ (g/cm3	Generated HC	
							10E-9	BBOE
#1a-c	3,842	213	10	956	544	2.46	829.41	6.138
#2	12,383	290	10	956	190	2.46	6,766.87	50.075
#3	2,260	290	6	956	60	2.46	866.76	6.414
#4a-b	457	76	2	750	520	2.73	4.36	0.032
#5a-b	2,395	107	2	750	166	2.73	81.71	0.605
#6a-b	3,695	122	2	750	45	2.73	173.52	1.284
								64.548

Red River Kukersites with HIo = 956 would have **generated ~65 billion barrels of oil equivalent**



Enhanced Oil Recovery

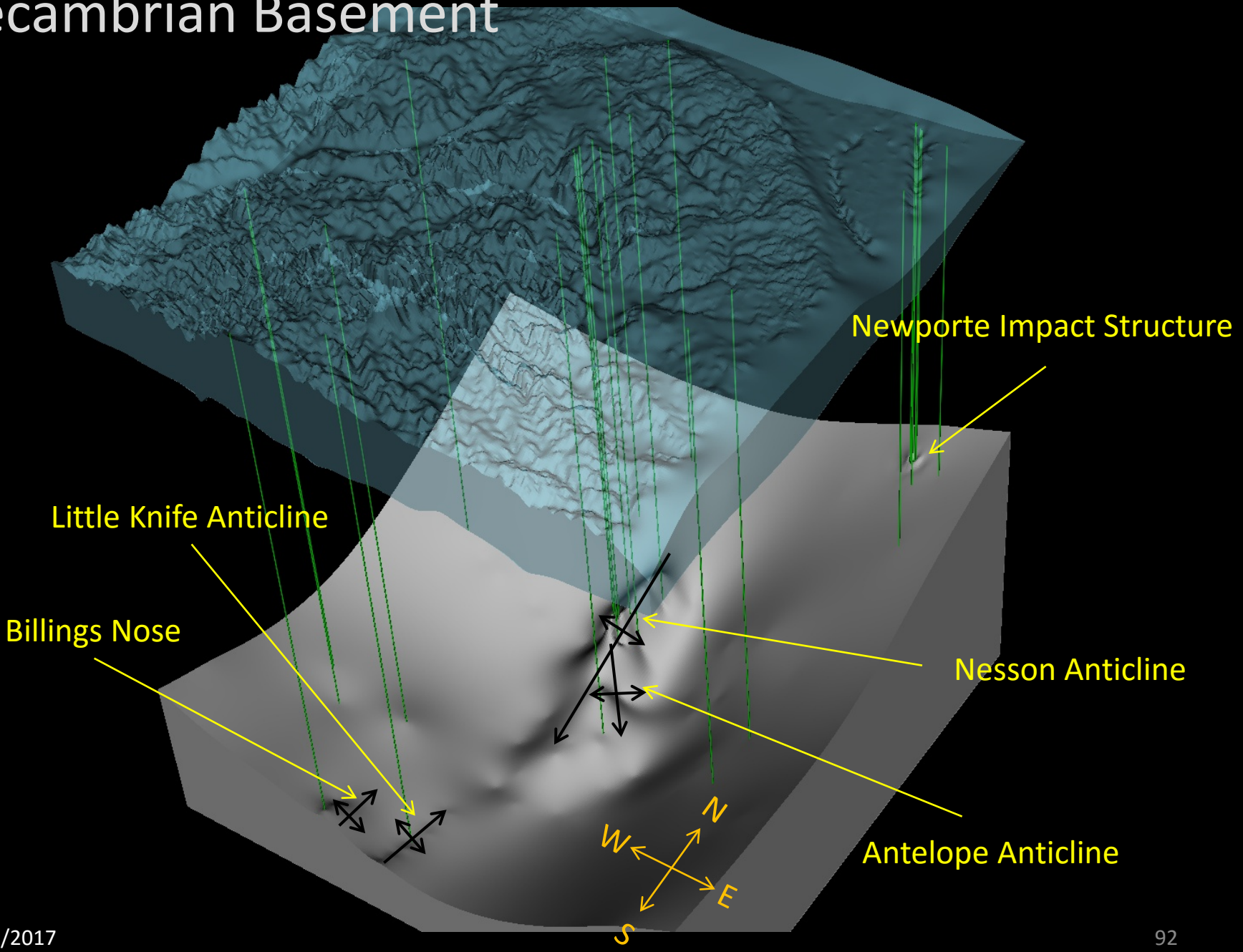
2015

- 665 wells
- 28,151 MCF of air injected per day
- 332,588 bbls of water injected per day

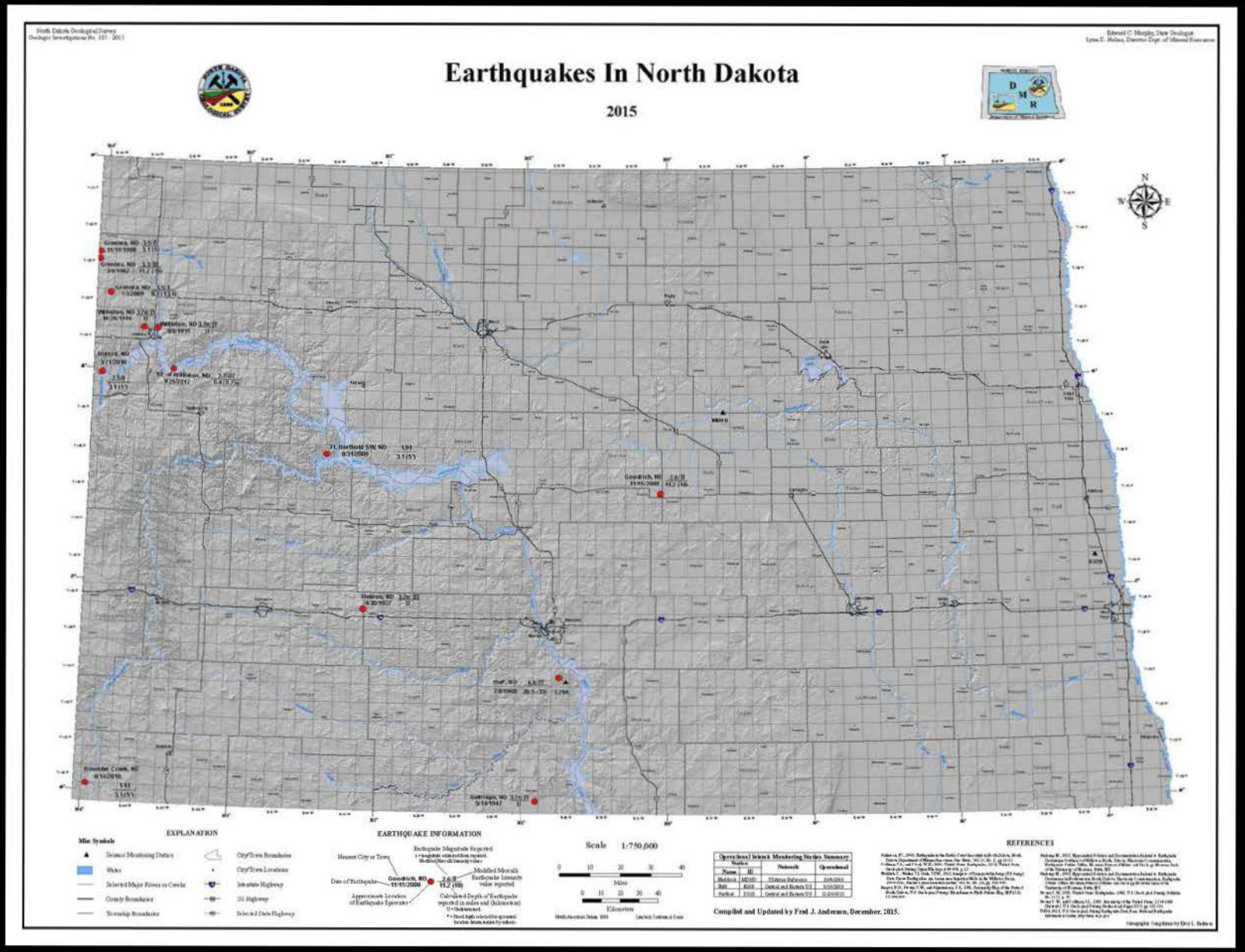
2016 (as of Oct.)

- 615 wells
- 15,339 MCF of air injected per day
- 327,286 bbls of water injected per day

Precambrian Basement



PRECAMBRIAN



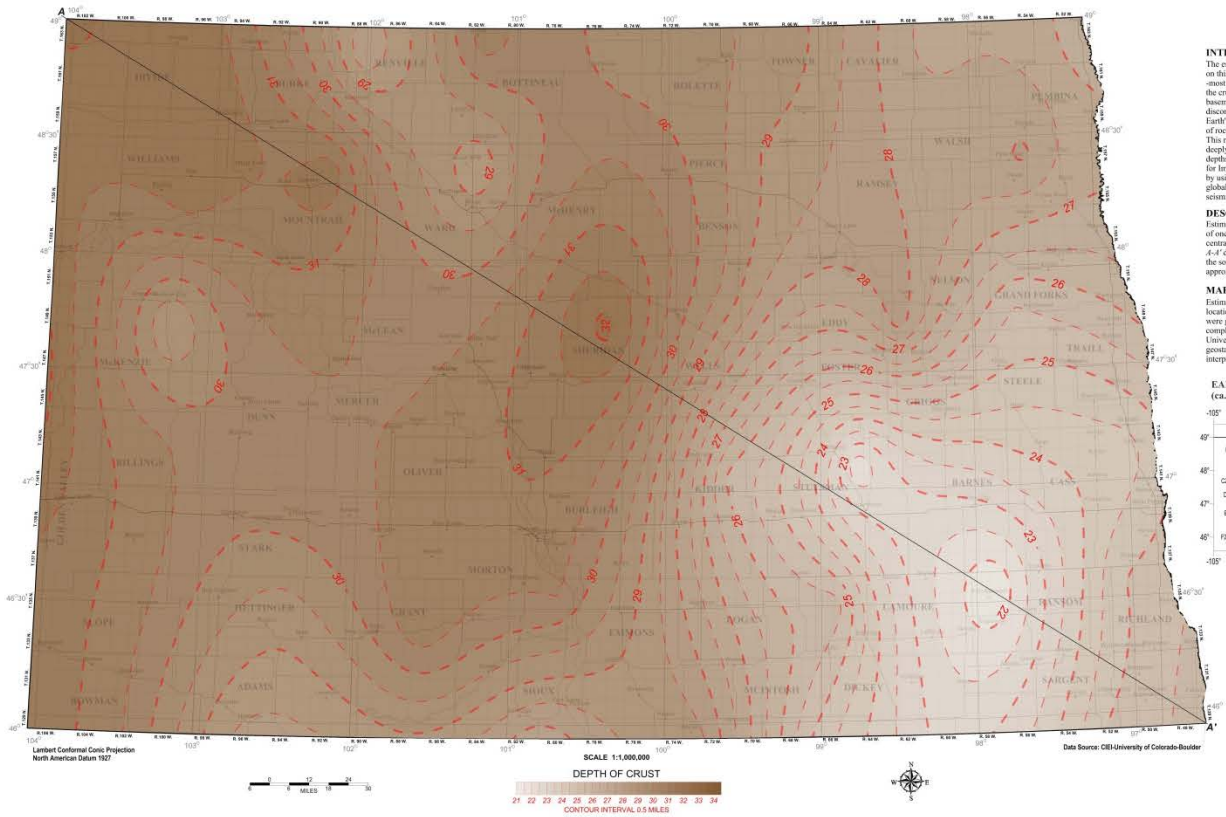
North Dakota Geological Survey
Miscellaneous Map No. 42

Edward C. Murphy, State Geologist
Lynn D. Helms, Director Dep. of Mineral Resources

Depth of the Earth's Crust in North Dakota

Fred J. Anderson

2016



INTRODUCTION

The estimated thickness of the Earth's crust in North Dakota is depicted on this map at a scale of 1:1,000,000. The crust of the Earth is the outer –most layer of rock and sediments covering the planet. In North Dakota, the crust includes the rocks of the Williston Basin and Precambrian basement on down to the depth of the Mohorovicic (Moho) seismic discontinuity, which commonly delineates the boundary between the Earth's crust and mantle. The Moho is the layer where a marked increase of rock density, and subsequent increase in seismic wave velocity, is found. This relative rapid change in density versus depth creates a boundary where deeply penetrating seismic waves can reflect and refract off of. The estimated depths to the Moho were determined by geophysical modeling at the Center for Imaging the Earth's Interior (CIEI) at the University of Colorado Boulder by using methods that incorporate ambient noise tomography and the record of global seismologic data collected from the EarthScope project's transportable seismic array that was in operation across North Dakota from 2008 to 2012.

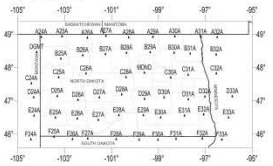
DESCRIPTION OF CRUSTAL THICKNESS

Estimated crustal thickness contours are mapped with a contour interval of one-half mile. Crustal thickness is highest in the northwestern and central portions of the state and thinnest in the southeast. Cross section *A-A'* depicts the estimated thickness of the crust from the northwest to the southeast corners of the state. An apparent thinning of the crust, of approximately ten miles, is found in the southeastern part of the state.

MAP ANALYSIS METHODOLOGY

Estimated crustal thickness values or Moho depths, were determined at the locations of transportable array seismic stations in the upper-Midwest, which were gathered from geophysical modeling studies of crustal thickness recently completed by the Center for Imaging of the Earth's Interior (CIEI) at the University of Colorado Boulder. Moho depths provided by the CIEI were geostatistically interpolated using an ordinary kriging algorithm coupled with interpretive smoothing during grid construction by the author.

EARTHSCOPE SEISMIC STATION LOCATIONS (ca., 2008-2012)



EXPLANATION

Depth contour (approximate) of the Earth's crust.

28

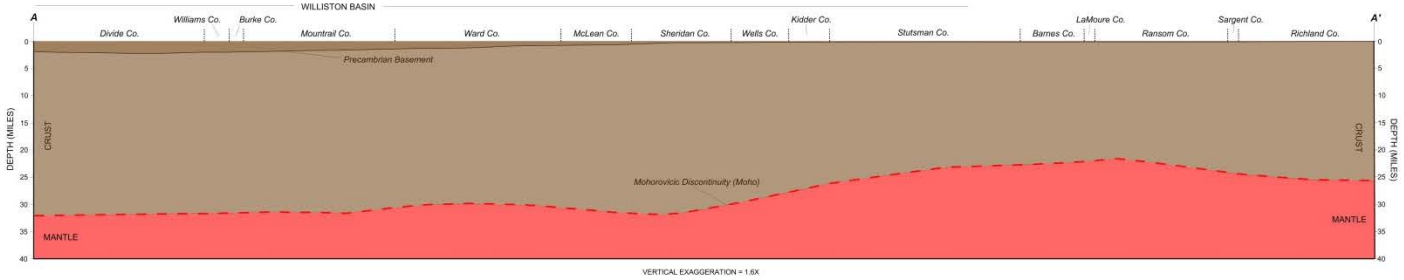
Depth (miles)

REFERENCES

Fowler, C.M.R., 2005, The Solid Earth, An Introduction to Global Geophysics, 2nd Ed., Cambridge University Press, 685 p.

Lowrie, W., 2007, Fundamentals of Geophysics, 2nd Edition, Cambridge University Press, 374 p.

Shen, W., M.H. Ritzwoller, and V. Schulte-Pelkum, 2013, A 3-D model of the crust and uppermost mantle beneath the central and western US by joint inversion of receiver functions and surface wave dispersion, J. Geophys. Res., doi:10.1029/2012JB009602, 118, 1-15, 2013.



#10
1-12-17
HB 1151

Testimony
House Bill 1151
Energy and Natural Resources Committee
January 12, 2017, 2:00 p.m.
North Dakota Department of Health

Good morning Chairman Porter and members of the Energy and Natural Resources Committee. My name is Karl Rockeman, and I am the director of the Division of Water Quality within the North Dakota Department of Health's Environmental Health Section. The Division of Water Quality protects and monitors our water resources to ensure the quality of surface and ground water for the public's use.

The division's spill investigation program oversees the reporting, response and cleanup of spills off of the well pad. The Department does not object to the bill as proposed. I am here to provide some clarifying comments related to HB 1151.

- The Department recognizes environmental risk is reduced from spills within containment that are properly cleaned up. The Department encourages operators to clean up all spills regardless of quantity.

- The Department understands that this bill will not impact reporting responsibilities or threshold requirements for spills that are off the well pad.

- Some fluids used on a well pad such as acids, biocides, corrosion/scale inhibitors and pH adjusters may present greater environmental or public health hazards than oil or saltwater. Does the proposed 10-barrel reportable quantity apply to all fluids, or just to oil and saltwater brine?

- In some cases the volume of a spill can be difficult to determine. Field inspections help to verify the accuracy of the reported information.

This concludes my testimony. I am happy to answer any questions you may have.

HB 1151
3-9-17
Att #1
pg 1

Testimony HB 1151

Rep. Roscoe Streyle, District 3

March 9, 2017

Chair Unruh and Senate Energy and Natural Resources Committee Members:

HB 1151 was amended heavily from bill introduction by the House Energy and Natural Resources Committee to address many of the concerns brought forward by landowner groups and other interest groups. The bill carrier, Rep. Anderson will offer an amendment to further address some concerns related to legacy wells after my testimony.

This bill relates to required reporting of spills (produced water, oil and gas fluids) in the oil and gas industry, adding a new section to NDCC 38-08-04. There is no statutory requirement to report currently, but rather in agency policy. This should be a legislative decision not an agency decision. This bill clarifies and simplifies the reporting requirements and will make Government more efficient and provide more accurate data. The bill also includes language adding spill data into the well or facilities file for review by the surface owner.

Currently, the industry is required to report ALL spills no matter the volume, type of fluid or location of the spill. The Federal Government requires reporting if the incident is 10 barrels or more, this applies to both On and Off pad incidents. ND is the most restrictive in the nation. By doing so state agencies are spending valuable time and money for no real benefit or purpose. This bill ONLY applies to spills ON pad or facility and if passed would still result in ND being more restrictive than the Federal Government.

The state needs staff to process all the unnecessary reports, staff to travel to and from location, staff to monitor the spill and staff to draft press releases. Let's instead focus our finite resources more wisely and tactfully, focusing only on spills that are off pad or facility, greater than 10 barrels that may have an impact to the environment. Spills ON pad have ZERO impact to the environment.

Gov. Burgum has spoken many times about the need to transform government, make it more efficient and responsive, this bill fits those missions. This bill will reduce the cost of government, removes burdensome requirement, clarifies the reporting requirements and will improve the quality of data used by policymakers when making public policy decisions.

The typical oil and gas well pad/site size in the Bakken field is between 5-9 Acres and a spill <=10 barrels is unnoticeable and these pads/facilities are designed to capture and retain spills.

Federal Government - 10 barrels On or Offsite

Oklahoma - 10 barrels On or Offsite

Texas - 5 barrels On or Offsite

North Dakota - 1 barrel On or Offsite - Propose changing to 10 barrels ON site ONLY.

HB 1151
3-9-17
Att #2
Pg 1

Health Department Data

2016: 1,248 spills reported in Oilfield Database:

	Stayed on Pad	Off Pad	Tribal Lands	Total
Total Spills	737	357	154	1248
10 Barrels or Less	517	257	133	907
No Quantity	112	97	50	249

"Of the 112 spills that stayed on pad and had no quantity I have been able to determine that 54 of them were 10 barrels or less and 29 were due to fire with no fluids hitting the ground. 44 of those were greater than 10 barrels. I have not been able to determine a volume on the remaining 2.

So for the purpose of the proposed bill (HB 1151) a total of 571 spill were 10 barrels or less and remained on the well pad.

Since the NDDoH does not have jurisdiction on tribal lands I do not have accurate data on the number that stayed on pad. Of the 154 tribal spills 118 were reported as being on pad. I do not have how many on pad spills were 10 barrels or less. But 100 would be a good, though rough estimate."

Spill Summary – 571 + 100 = 671 on pad spills 10 barrels or less.

671/1248 = 53.76% of all spills occurred on pad and were 10 barrels or less.

Summary

1. Makes government more efficient.
2. Match State Law with Federal Law for ON pad reporting, ND still more restrictive OFF pad.
3. Cost saving measure for the state. Focus resources on spills that pose risk to health, safety and environment.
4. Clarify the law. Federal vs. State reporting requirements cause confusion.
5. Well Pads and facilities are designed to handle spills.
6. Bill requires impermeable base and containment before new requirements apply.
7. Bill includes language to include spills data in well or facilities file.
8. Bill includes 15-day period if multiple spills under 10 barrels occur, but cumulatively over 10 must be reported.
9. 53.76% of "spills" were on Pad and under 10 barrels in 2016. 671/1248
10. This bill ONLY applies to spills on location, does NOT change reporting of Off pad incidents.
11. This bill has nothing to do with cleaning up spills, all must be cleaned up with or without this bill.
12. The Health Department has 5-Full-time and 2-Part-time staff in the spill program and some volunteers.
13. The NDIC has staff that must respond to this events as well.

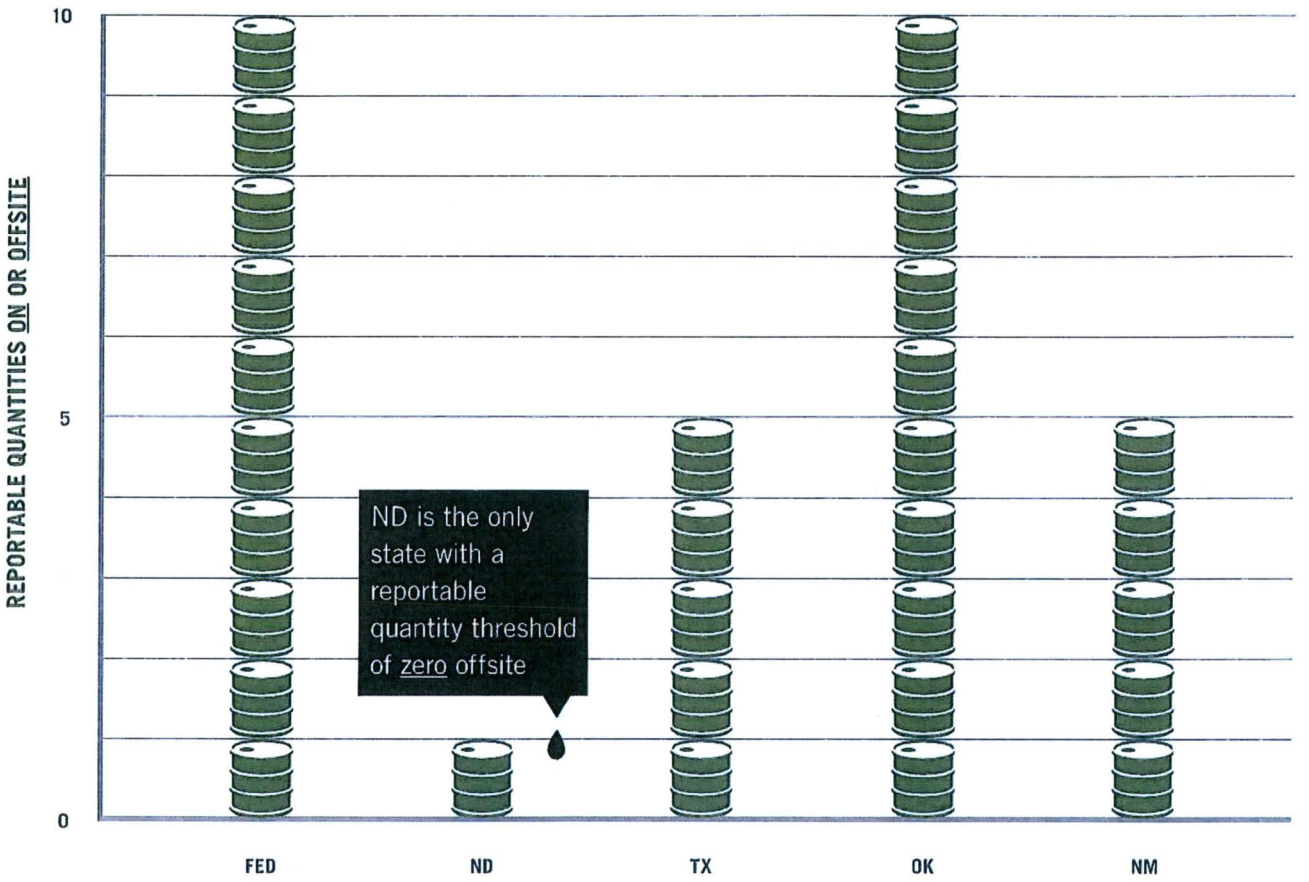
2. A person controlling or operating a well, pipeline, receiving tank, storage tank, treating plant, or other receptacle or production facility associated with oil and gas, or with water production, injection, processing, or well servicing, shall report to the commission any leak, spill, or release of fluid. A report to the commission is not required if the leak, spill, or release is crude oil, produced water, or natural gas liquids in a quantity of less than ten barrels cumulative over a fifteen-day time period and remains on the facility or site and the facility or site has impermeable base material and containment.

3. Any written violation notice issued by the commission regarding the notification of a fire, leak, spill, blowout, or leak and spill cleanup must be placed in the well file or facility file and the files must be available for review by the surface owner.

HB 1151
3/9/17
Att #3
Pg 1

COMPARATIVE STATE-BY-STATE ANALYSIS OF REPORTABLE QUANTITIES (BBL) TO LAND

Top US Oil Producing States (Lower 48)



Federal reportable quantities should set the standard

1. The federal threshold for reporting is 10 barrels, while North Dakota is 1 barrel. North Dakota is wasting tax dollars by inappropriately focusing resources on smaller reportable quantities.
2. Approximately 70% of all releases in North Dakota's database were less than or equal to 10 barrels.
3. North Dakota requires agency reporting for an offsite release of any volume, whereas other states only require reporting when reportable quantities are exceeded.
4. North Dakota's low reportable quantities threshold creates an unnecessary administrative burden.
5. Actual North Dakota volumes are being distorted because of the low threshold for reportable quantities.
6. Regardless of volumes released, all releases are cleaned up.

Fr. Rep Anderson HB 1151 3-9-17 Att # 4 Pg 1

HB 1151 Amendment for the Engrossed Bill

Page 5 line 20 after the word "period" overstrike "~~and~~"

Page 5 line 21 after the word "the" insert "site or" and after the word "facility" overstrike "or site and the facility or site has impermeable base material and containment." And replace with "and is on a well site wher the well was spud after September 1, 2000 or on a facility other than a well site which was constructed after September 1, 2000.

Fr Rep Anderson

HB 1151
3-9-17
Att #4

A Report to the commission is not required if the leak, spill, or release is crude oil, produced water, or natural gas liquids in a quantity of less than 10 barrels cumulative over a 15 day time period remains on the site or facility and is on a well site where the well was spud after September 1, 2000 or on a facility other than a well site which was constructed after September 1, 2000.

pg 2

NORTH DAKOTA
PETROLEUM
COUNCIL
100 West Broadway, Ste. 200 | P.O. Box 1395 | Bismarck, ND 58501-1395
701.223.6380 | ndpc@ndoil.org | www.NDOil.org

HB 1151
3-9-17
AH #5
pg 1

House Bill 1151
Testimony of Ron Ness
Senate Energy and Natural Resources Committee
March 9, 2017

Chairman Unruh and members of the Senate Natural Resources Committee, my name is Ron Ness, president of the North Dakota Petroleum Council. Last year the North Dakota Petroleum Council represented more than 500 companies in all aspects of the oil and gas industry, including oil and gas production, refining, pipeline, transportation, mineral leasing, consulting, legal work, and oilfield service activities in North Dakota. I appear before you today in support of House Bill 1151 and the amendment offered which provides a clear delineation of which well pads and facilities meet the requirement. That is a primary concern for industry, since the fine is up to $12,500 per day for violations. The amendments made by the House addressed many of the concerns relating to multiple spills and the obligation of the operator to clean-up all spills which is required regardless of any reporting requirement. It also provided a place for landowners to get the information from the monthly ND Industrial Commission well-site inspections including written violation notices. These were good changes and addressed the reasonable concerns presented at the hearing.

The State of North Dakota has an extremely stringent spill reporting requirement regardless of whether the fluid is contained on the pad or production facility or the fluid is off the pad or production facility. House Bill 1151, if passed, would bring North Dakota in line with what other states and the federal government require.

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The Energy and Environmental Research Center (EERC) has conducted extensive research and analysis of spill data in the state. In a report that they released in 2015, they recommended that the State of North Dakota recognize the impact the minimum reporting threshold has on spill statistics and evaluate how to interpret and report these data accordingly. The report observes that North Dakota has among the lowest minimum reporting thresholds of the top seven oil-producing states. This creates the potential to skew the comparison of spills between states with higher reporting thresholds, making it appear that North Dakota has more spills than other oil-producing states.[1] In fact, when comparing states that have had recent oil booms, North Dakota has performed at par or better than its peer states with regard to spill volumes per unit of production.[2]

Currently, state law requires that the release of any fluid in quantities equaling one barrel (42 gallons) or greater if the spill occurs on the well pad be verbally reported to the North Dakota Department of Mineral Resources (DMR) immediately and that an initial written spill report be submitted within 24 hours with ten-day follow-up. If a spill of any fluid, *including fresh water*, migrates or occurs off the well pad, any and all quantities (there is no minimum threshold) must be reported to the North Dakota Department of Health (NDDoH) immediately.

This threshold is even more stringent than the federal government's. The Bureau of Land Management, which is the regulatory agency in charge of federal surface and federal minerals, has established major event and minor event thresholds. The immediate reporting (within 24 hours) threshold is not triggered until a spill is greater than 100 barrels. A written report within 15 days is required for "minor events," which are those with quantities of greater than 10 barrels, but less than 100 barrels. If a spill of less than 10 barrels occurs in a non-sensitive area, no report is required.

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[1] Liquid Gathering Pipelines: *A comprehensive analysis,* Energy and Environmental Research Center, University of North Dakota, December 2015.
[2] IBID

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Bureau of Land Management (BLM) reporting requirements:

1. **Major events >100-barrels:** reporting within 24 hours;
2. **Minor events >10 barrels but <100 barrels:** written report within 15 days;
3. **<10 barrels in non-sensitive areas:** no report required

Comparatively, other states have similar thresholds. In California's San Jochim Valley, five barrels or more must be reported if the spill is not contained, and 10 barrels or more must be reported if the spill is contained and not a threat to state waters. One barrel must be reported if it is off of the well pad.

Texas' requirement states that if loss is less than five barrels, reporting is not required unless the spill has created a sheen on water. In New Mexico, a release of five barrels but not more than 25 barrels must be reported within 15 days of discovery. Spills in excess of 25 barrels must be reported verbally within 24 hours. Colorado regulations require reporting within 24 hours of spills of one barrel outside of the berm and five barrels or more inside of a berm, followed up with a detailed report within 10 calendar days. Wyoming has a spill reporting threshold of 10 barrels.

Only Alaska's North Slope has as strict of regulations as North Dakota with three levels of reporting:

1. >55 gallons: report immediately;
2. >10 gallons but <50 gallons: report within 48 hours;
3. >1 gallon but <10 gallons: submitted on monthly report.

One of the reasons these states and the federal government have these higher thresholds for releases that occur on a facility is because they recognize that engineered containment pads provide the necessary protection to make reports of these minor spills unnecessary.

Engineer designed for fluid containment:

Two-thirds of the spills or releases in 2016 occurred on specially designed and constructed facility pads and were completely contained within the pad boundaries. These facilities are designed to provide containment for fluids generated and stored on location. A spill on a pad is similar to spilling juice on a coffee tray or cookie pan. The lip around the perimeter of the tray is similar to a perimeter berm or containment dike on the location: the milk spilled is contained on the tray in an area designed for containment, which makes it easy to clean up. Just as a tray eliminates any potential damage to your carpet or furniture if juice is spilled, a production or processing pad containment eliminates potential damage to health, safety, or the environment.

To further illustrate, the average well pad in North Dakota has seven wells and a tank battery. The average well produces 500 to 1,000 barrels of oil per day. The quantity of fluid produced on the pad is taken into the design considerations in containment design. Every new well pad is now required by the NDIC to install and maintain a 6-inch perimeter berm. For an 8.5 acre well pad, this equates to 30,000 barrels or more of fluid general site containment. In addition to this requirement, specific site containment around tanks is dictated by the NDIC and the EPA. Saltwater disposal well pads and processing facilities follow the same or similar design specifications for spill containment, taking into account the quantity of fluids produced on location that may need to be contained for ease of cleanup. With facility pads engineered to manage thousands of barrels of produced fluids, containment of a 10-barrel spill is well within its design parameters. As was illustrated earlier, a 10-barrel spill on the average seven- to eight-acre well pad would be similar to a few drops of juice spilled on your tray. If a release does occur on the facility's pad, the vast majority are contained within the designed containment areas. The spill is vacuumed and any recovered crude oil is put back into battery tanks or gathering pipelines and sold. Any waste, as well

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as the impacted surface material is removed and properly disposed of as authorized by the NDIC. The impacted surface material is then replaced.

How pads protect the environment:

During oil and gas facility construction, the topsoil and subsoil are stripped from the area and stored separately for future use or future reclamation of the well site. The area is compacted to design specification and clay liners and/or synthetic liners are applied to create an impermeable fluid barrier and prevent the spill from penetrating below the pad surface. The development area for an oil and gas facility (including well pads) is then contoured to design and landscaped to provide a surface that will only allow fluids to flow in the desired direction(s), allowing proper management and containment of spills and storm water or meltwater. This may require sloping the pad away from any surface water, rivers or creeks. Dikes and berms around storage tanks and heater treaters, as are secondary containment dikes as required by EPA. Six-inch perimeter berms are considered tertiary containment for all newly constructed pads or may be required to be added retroactively by the DMR.

Storm water and snow melt water are contained within the well pad dike system and can only be discharged from the well pad once it has been determined that it does not contain any potential contamination of saltwater or hydrocarbons.

The oil and gas industry is required by federal and state agencies to provide several layers of containment. These include:

- Specific Site Containment;
- EPA – Tanks are required to have an impervious berm/dike that is 110% of the largest tank OR largest tank volume plus freeboard;

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- NDIC – Tanks are required to have a berm/dike that is largest tanks plus one day's fluid production;
- NDIC – Tank Batteries are required to have a 6-inch perimeter berm;
- General Site Containment;
- EPA – Must have containment for most likely spill event around all oil handling equipment. This many include retention areas, open berms, retaining walls, curbing, designed drainage systems, drip pans, etc.

Industry takes containment to another level:

In many cases, oil and gas operators design secondary and tertiary containment for storage tanks that are above and beyond regulation (specific berm directly around tanks and perimeter berm). The tanks may also be provided another level of containment depending on pad design if there are retention areas on pad. There may even be multiple containment structures provided for other equipment on pads if the operator chooses to berm around treaters or LACTs.

North Dakota's current reporting requirement does not acknowledge the extensive planning and protections that are inherent in these specially engineered and designed facility pads. As noted, releases that occur on these pads are similar to spilling juice or coffee on a coffee tray: the spill is contained and quickly and easily cleaned up.

Rather than having state agencies use valuable resources on responding to these contained pads that have no impact to the environment, it would be more prudent for agencies to focus their time and resources on the 33% of the spills that occur off the tray or containment pad. These have a potential to impact the environment and require the full attention of regulators. It should be noted that the reporting threshold for these spills will NOT change under this bill. The North Dakota

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Industrial Commission did not change the reporting threshold in their rule-making, but instead left that decision to the North Dakota Legislature, and as a result, HB 1151 is before you.

House Bill 1151 will focus the state resources on spills that have the potential to directly impact health, safety, and the environment. The bill will not change the fact that the responsible party is still liable for spill clean-up and remediation, which can be as simple as vacuuming or scooping the spill and replacing pad surface material if the release occurs on a pad.

The spills we are discussing today are minor spills that occur on an engineered pad with containment, pose no environmental risk and are easily cleaned up. They are not a major catastrophe and this is evidenced by the federal government, several other states, and the EERC study which have all determined this reporting requirement as good practice.

We urge a Do Pass on House Bill 1151. I would be happy to answer any questions.

2017 HB 1151 – DO PASS TESTIMONY **Kathleen M Spilman, P.E.**

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Chairman; Committee Members. My name is Kathleen Spilman. I am a registered professional engineer in this state with a BS degree in chemical engineering from UND-Grand Forks. And a proud native of North Dakota and work for Keitu Engineers & Consultants, Inc., a North Dakota based regulatory affairs/environmental technical service firm located in Mandan. I have over 35 years of experience in the oil and gas industry with the vast majority here in North Dakota, long before the Bakken got Rock'n. Among our many assignments, we assist clients with developing emergency response and spill response plans as well their implementation. I have prepared or reviewed hundreds of plans and procedures involving well pads, terminals, pipelines and gathering systems as well as commercial and industrial sites with refined oil products. I served as a private industry representative on the ND State Emergency Response Committee since 2007. I welcome the opportunity to testify in favor of a "DO PASS "recommendation on House Bill 1151 today.

There is a common misconception that there is one notification necessary when an unintended release occurs. Each agency, Federal, State and frequently local, as deemed necessary to protect their specific area of responsibility, develop and implement a rule suitable to their purpose. And we are here today to discuss only one of the many complex and overlapping the spill reporting requirements, specifically the ND Department of Mineral Resources rule applicable to oil production well sites. Our actions today do not impact the existing Federal Clean Water Act rules, typically referred to as the oil spill prevention, control and countermeasure rules or EPA's "SPCC" rules which require reporting of any oil which reaches or could threaten to reach surface water. It will not change the North Dakota reporting rule which requires the County Emergency Manager to be contacted should ANY RELEASED AMOUNT endanger or threaten to endanger people or property off the lease pad. Nor will it change EPA's new "SPCC rules for chemicals" currently under development and expected to be announced later this year. Or change existing CERCLA rules which already establish reporting requirements for chemicals and mixtures.

Nothing we do today will relieve a responsible party of its duty under law to clean up a spill. But we live in an age of information overload. While we have computer systems that will "rack and pack" data, the key becomes dealing with data which requires action on our part. Now that through our legislative process we have moved to common ground on which production sites are low risk and are deserving of regulatory relief, the key point of dissention is apparently the volume threshold for a report. As we ask our state agencies to do more with less, we will need to forgo some data collection in order to focus available resources on events that demand their attention.

Under US EPA CERCLA rules, or what most of us refer to as "Community Right To Know" regulations, the reporting threshold, if released unintentionally and regardless or not it could actually leave the spill site, crude oil reporting is traditionally triggered based on its benzene content. Benzene has a reportable quanity or RQ of 10 pounds. At approximately 0.25 wt% benzene, our 42°API Bakken shale crude oils CERCLA establishes a reporting threshold of 14 barrels. Traditional or "legacy" crude oils will trigger CERCLA reporting at lower but still order of magnitude consistent levels.

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This bill will also not change separate and additional potential reporting under other existing Federal laws and policies where applicable such as the BLM, US Forest Service and the US Fish and Wildlife Service.

I reviewed spill data from the State's reporting system for 12 months from mid January 2016 to mid January 2017 prior to my testimony for the original version of this bill. 1500+ TOTAL incidents reported. 80% oil patch related. Of the oil field incidents, 76% were contained on-site.

Consider that legislative changes in 2013 and 2015 establishing a centralized spill communication system funnels spill reports to over 80 individuals and agencies are contacted via email. For every event. Over 4 each and every day.

Somehow the story about the child crying "WOLF" comes to mind.

So rest assured your support of this regulatory relief will NOT intrude on the required regulatory notices when PEOPLE or the ENVIRONMENT are at RISK. As state agencies are being asked to cut back, we are all going to have to give up something. There is a real cost to keeping everyone in the information loop for events that do not require action on their part. Some data gathering effort can and should be sacrificed to devote time to deal with real spill issues.

I ask for "DO PASS" vote on this bill.

I would be happy to answer any questions you may have.

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TESTIMONY FOR HB1151
March 9, 2017

Chairman Unruh, members of the committee. Thank you for the opportunity to comment on this bill.

My name is Wayde Schafer and I am the Conservation Organizer for Dacotah Chapter of Sierra Club based here in Bismarck.

HB1151 would amend and reenact section 38-08-04 of the North Dakota Century Code, relating to the reporting of well pad or oil and gas production facility fluid spills by eliminating the current requirement for reporting a spill of oil, salt water, or natural gas liquids that is less than 10 barrels.

A barrel contains 42 gallons. That means that 420 gallons of toxic or hazardous material can be spilled onto the ground and, since it does not have to be reported, no one but the oil company will know. This is not an insignificant amount of oil. As I'm sure you're aware, one single gallon of oil can pollute a million gallons of water. Produced water from fracking can render any soil it touches completely useless for agriculture or wildlife.

Oil and salt water spills in "Oil Country" that do get reported are always "guesstimates." And, often the amount is under estimated. At the height of the oil boom in 2014 there were 2,596 oil related spills reported. That's just in one year! (I've attached a chart from a ND Department of Health 2016 report to your copy of my comments). The point I'm trying to make is that HB1151, if passed, is going to result in a lot of unreported oil and toxins on the ground.

What is the pressing need driving this proposed change to the oil spill reporting requirements? Is the public demanding that less oil and salt water spills be reported? What is the benefit to North Dakotans from not reporting oil spills that are less than 10 barrels?

I know what the benefit is for the oil companies. They're obviously embarrassed by the number of spills. By allowing the oil industry to take some spills "off-the-books" this bill makes it look like there are fewer spills. But, the number of actual spills remains the same. If the oil industry is truly worried about their image they should work harder to eliminate dangerous and wasteful spills, not hide the true number of spills with what I would call "creative accounting" practices.

The public expressed their outrage loud and clear after a major spill went unreported for 11 days, causing extensive damage to a farmer's field. As a direct result of that public outcry, The ND Department of Health created a publicly accessible website for all reported oil related spills.

The Health Department's website is working. HB1151 takes away the transparency related to oil spills that the public has demanded. Codifying the withholding of information that North Dakotans have said they want is never good public policy.

Dacotah Chapter of Sierra Club respectfully requests that this committee recommend a DO NOT PASS for HB1151.

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Fr. Wayde Schafer

Oilfield Impacts and the North Dakota Department of Health Environmental Health Section

October 2016

Environmental Health Section
North Dakota Department of Health
918 East Divide Avenue
Bismarck, North Dakota

number of spills is expected to increase as well. Figures 20 and 21 illustrate the change in number of spills reported and the response by staff for each calendar year.

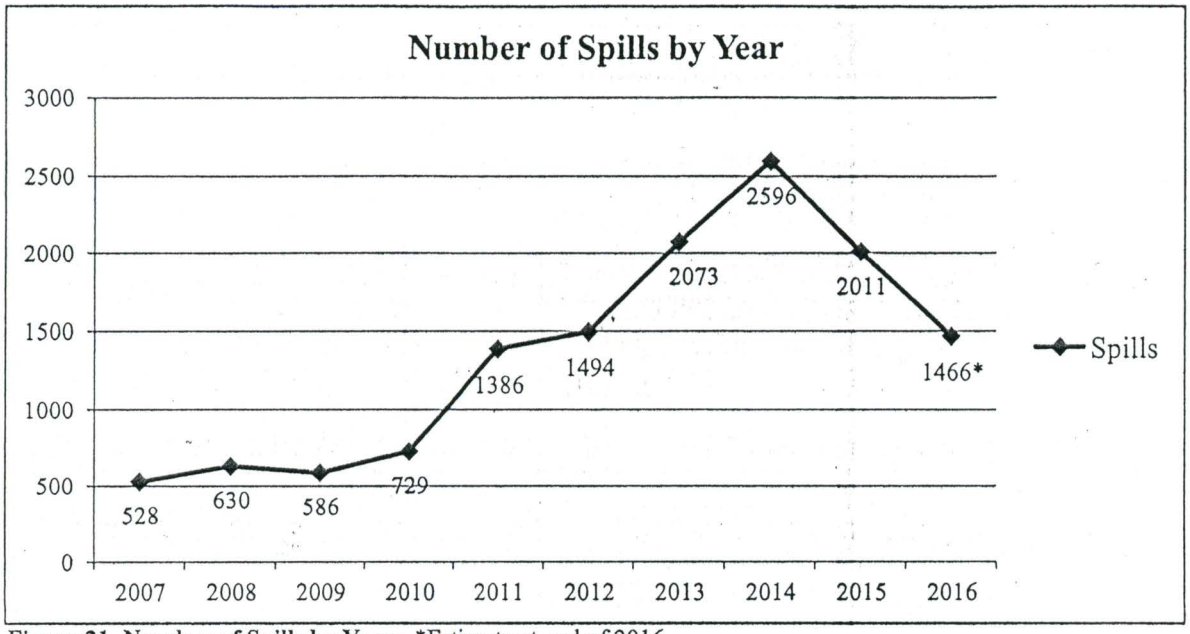

Figure 21. Number of Spills by Year *Estimate at end of 2016

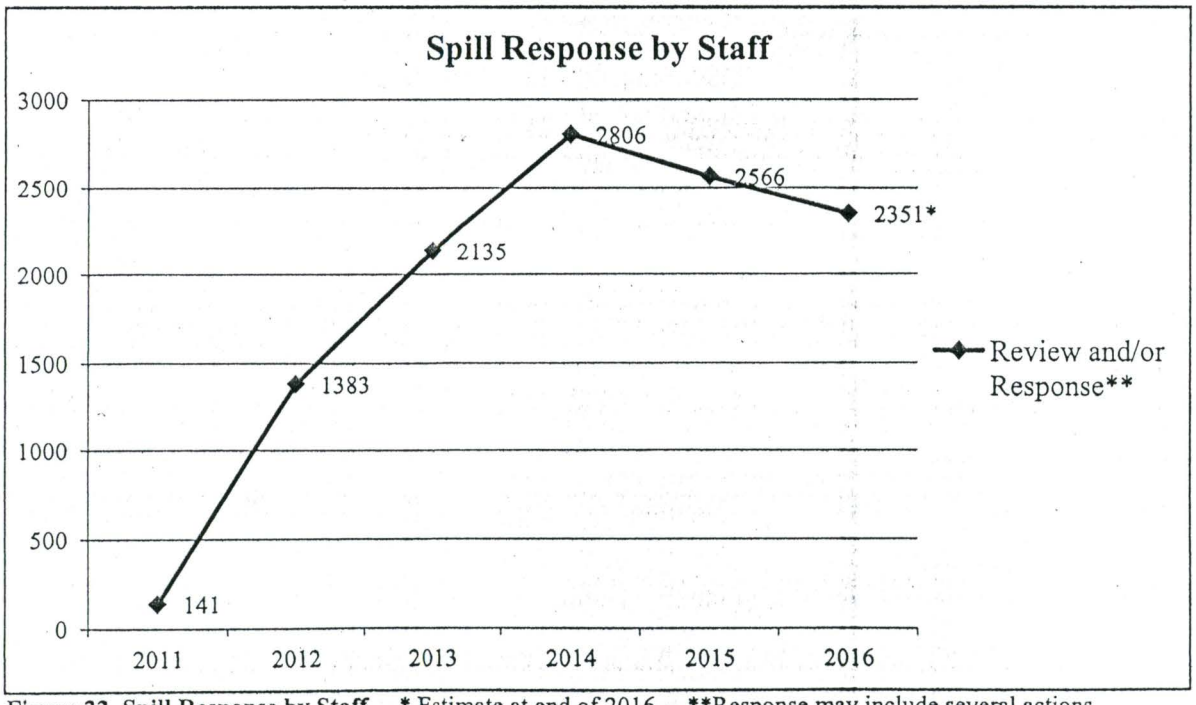

Figure 22. Spill Response by Staff * Estimate at end of 2016 **Response may include several actions (e.g., review to determine if follow-up is necessary, phone conversations and inspections).

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left in comm.

Senate Energy and Natural Resources Committee
HB 1151 Testimony
March 9, 2017

opposed

Madam Chairwoman Unruh and Senate Energy and Natural Resources committee members.

For the record my name is Kevin Herrmann, 300 Fair St. SW, Beulah, ND. I could not be at the scheduled committee hearing for House Bill 1151 but I am able to provide written testimony. I stand opposed to Engrossed House Bill 1151. I am a landowner with pasture, cropland and hay land.

As a landowner, I have a big concern on Page 5, line 18, stating "A report to the commission is not required if the leak, spill or release is crude oil, produced water or natural gas liquids in a quantity of less than ten gallons cumulative over a fifteen-day time period and remains on the facility or site and the facility or site has impermeable base material and containment".

It is my understanding this statement was a compromise amendment to House Bill 1151 from the House Energy and Natural Resources committee to the concerns of landowners. It is not a compromise to any landowner as long as "less than 10 gallons" is stated in this bill. The report of any leak, spill or release of any liquid is very important for the landowner.

Before House Bill 1151 was amended out of House Energy and Natural Resources committee, Lynn Helms, Director of Department of Mineral Resources, gave an answer to a question that House Bill 1151 as originally written would have seen up to 69% less reporting of any leak, spill or release of any liquid. With this amended version of House Bill 1151, how much less reporting would there be?

Isn't the soil in the ground very important for producing hay, crops and grass for cattle when the well pad or oil-gas production facility goes back to the landowner? When the area of well pad or oil-gas production facility is being reclaimed back to farming or ranching condition, all reporting is very important in case that a certain part of land will not be able to grow crops or grass.

It is my understanding there will be soil sampling in the well pad or oil-gas production area but the soil sampling is not every inch of the affected area. There is a chance a part of contaminated soil could be missed in the soil sampling.

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Which brings up another concern, Page 5, lines 23-25, the wording does not provide a landowner direction on how or where to acquire the written violation of fire, leak, spill, blowout or leak and spill cleanup in the well file or facility file that pertains to their property.

As a landowner, Engrossed House Bill 1151 is not workable. I am asking for a Do Not Pass on Engrossed House Bill 1151.

Thank you,
Kevin Herrmann

delivered after comm. hearing

Patty Jensen

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pg 1

SB 1151

Madam Chairman and members of the committee, my name is Patty Jensen from Tioga. I am not in favor of this bill. I live in an area that has a lot of old oil field. I believe that we are starting to see the result of the oilfield impacting our water.

I have with me test results from 3 water wells. Two of the water wells are located on an oil spill site that is on our land. I copied a page out of their semi-annual report. It shows that "the bacteria located in a regional aquifer and a perched groundwater zone is dormant and stressed". They conclude it is likely an issue of sodium and chloride concentrations. It states that "the bacteria are not expressing the gene functions that promote degradation of the target compounds", the target compound is benzene. This is not a result of their oil spill, nor do I believe they are naturally occurring.

The third water well that I have information on is an observation well that the State Water Commission put in, in 1966. There are only 2 logs for this well, one in 1966 and one in 2007. When you compare them there is a significant increase in the chloride, sodium, calcium and the TDS. The TDS "total dissolved solids" went from 477 to 3230. Per a publication put out by NDSU calves could be affected by drinking this water. This well is on a school section that is pasture. I don't understand how this happened, but I believe it happened following state guidelines, and now you are considering making those guidelines more lenient.

Do you know that when water and oil come in contact that the benzene dissolves in the water? Benzene is a carcinogenic. Imagine a heavy rain after a spill. These three wells show that the bacteria in the water doesn't work like it should to eat benzene because of excess salt. Does this concern any of you?

I believe that the aquifer that our house well pulls from is very close to if not under a location ¼ mile from our house. We drink that water. That location does have plastic down. Another location is about 200 feet from our stock pond used by our cattle. I believe the water that feeds the stock pond is again under the location. That location did not put plastic down. these wells are new wells.

You say the location has to have an impermeable base. I don't believe there is such a thing as an impermeable base and I have had a Professor from NDSU say the same thing to me. What qualifies as impermeable? Who determines if a location is impermeable? Do you set up a database for the permeable vs. impermeable? How much does that cost? If they happen to cut the plastic does it switch to the permeable database? Do they still have it straight 15 years from now, 30 years? That third well shows impact over a 41 year span. With today's technology it is not a hardship for the oil industry to report their spills over 1 BBL, they can do it from their phone on location, not a big deal. I also don't think they can accurately guess how much was spilled. Is this about stats? Are we being sacrificed for better stats?

original

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It was suggested at the beginning of our oil spill that they lay out a big sheet of heavy plastic and put the oil impacted dirt on this to keep from impacting more land until the soil could be run through the TDU. They determined this was not a good idea and one of the reasons was because if oil sits on plastic it will weaken the plastic over time, almost melting it. That does not sound impermeable to me. We also know from our oil spill that clay may slow things down but it is not impermeable. Are they classifying a clay location as impermeable?

Shortly after the price of crude dropped someone taking care of locations stated that he had been told to only take care of the big issues to let the small issues slide. This is why I feel it is important that all spills be reported over 1 BBL. I know that there are a lot of good companies out there, and I know there are companies that care more about their bottom line than the environment. I think someone needs to be looking over their shoulder. Are my neighbors, myself and our cows going to be drinking those spills someday?

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7.0 CONCLUSIONS

- Both the shallow, perched groundwater and regional groundwater gradients are consistent with historical flow directions.
- Second and Third Quarter 2016 analytical data indicate benzene concentrations in wells MW-12 and VP-1 were above the NDDoH action levels. Concentrations decreased in both wells from Second to Third Quarter. TPH detected in well VP-1 exceeded the NDDoH action levels.
- Second and Third Quarter 2016 groundwater analytical data indicate the presence of DRO and MOR compounds above historic background detections in well VP-1.
- Historic groundwater analytical and forensic data collected from on-site monitoring wells and three off-site residential supply wells indicated that TPH-DRO-like compounds previously observed were naturally occurring and were not from the site or from other petroleum production or pipeline conveyance-related sources.
- Microbial analysis for regional aquifer well RMW-3 was consistent with results from MW-12 completed in the perched groundwater zone. The detected aerobic gene function was low, and no anaerobic gene function was observed.
- Microbial analysis for MW-12 and RMW-3 indicated a population of bacteria present that is likely dormant and stressed. The bacteria are not expressing the gene functions that promote degradation of the target compounds. Typically, this only occurs when an adverse condition is present that disrupts microbial function, likely an issue of sodium and chloride concentrations.
- Pump test data indicate there is no observed connection between the regional aquifer and the perched groundwater zone.
- Pump test data from TDU-1 indicate confined conditions are present within the regional aquifer. Confined conditions, by definition, have an impermeable layer existing above the water bearing unit which prevent surface water from "seeping" into the aquifer.
- **No pipeline release-related impacts have been observed in the regional groundwater aquifer to date.**

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158-094-16 BBB

Data Source	ND State Water Commission	**Well Index**	9276
County	Mountrail	**Date Drilled**	1966-08-11
Aquifer	Gravel Sediments	**Purpose**	Observation Well
Basin	Lake Sakakawea	**Casing Type**	PVC
MP Elevation (ft)	2309.45	**Diameter (in.)**	1.25
Surface Elev. (ft)	2307.45	**Screened Interval (ft)**	50 - 60
Elevation Source (Datum)	DEM - 30 meter (NVGD29)	**Coord (Long,Lat)**	-102.841311, 48.516552
Total Depth (ft)	100.00	**USGS ID**	
Bedrock Depth (ft)	76.00		

Lithologic Log

Interval (ft)	Unit	Description
0 - 2	TOPSOIL	Pebbly loam, black
2 - 18	CLAY	Silty to sandy with pebbles and occasional rocks, yellowish gray to moderate olive brown, soft, slightly to moderately cohesive, oxidized (till)
18 - 33	CLAY	Silty with sand grains, pebbles, and occasional rocks, olive gray, moderately soft, very cohesive (till)
33 - 36	CLAY	Olive gray to olive black, moderately soft, cohesive and plastic, tight
36 - 41	TILL	As above, sandy
41 - 47	SAND	Medium, gray, well sorted, subrounded, quartzose and lignitic
47 - 62	GRAVEL	Fine to coarse, sandy, poorly sorted, angular to subrounded, mostly limestone, granitic rock, shale and ironstone, limestone pebbles heavily stained,
62 - 76	CLAY	Silty with sand grains, pebbles, occasional gravel stringers and rocks, olive gray, moderately soft, very cohesive (till)
76 - 91	SAND	Very fine and fine, greenish gray to dark greenish gray, soft, moderately friable, calcareous, lignitic
91 - 100	SHALE	Light to medium gray to greenish gray, slightly hard, tight

[Hydrograph] [Water Levels] [Water Chemistry]
[Return to Site Selection]
* Recorder Data will not be plotted in the Hydrograph because of the volume of data involved!

North Dakota State Water Commission | 900 East Boulevard Avenue, Dept 770 | Bismarck, ND 58505-0850

Phone (701) 328-2750 | Fax: (701) 328-3696 | E-mail

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General Info			
Date Sampled	1966-08-12	**Downhole Temp**	
Time Sampled	00:00:00	**Dissolved O2**	
Pump Time	480	**Field Conductivity**	910
Yield	0.5	**Field pH**	
Water Level		**Field Temp**	8.3
Sampling Method		**Lab Conductivity**	784
Stage		**Lab pH**	8
Surface Depth	0	**Lab ID**	
General Characteristics			
Suspended Solids (mg/l)		**Alk. as CaCO3**	
TDS Determined (mg/l)	488	**SAR**	0.9
TDS Calculated (mg/l)	477	**RSC**	
Hardness	355	**Percent Sodium**	19
Non-Carbonate Hardness	18		
Major Cations and Anions			
Silica (mg/l)	23	**Flouride (mg/l)**	0.4
Calcium (mg/l)	56	**Bicarbonate (mg/l)**	412
Magnesium (mg/l)	52	**Carbonate (mg/l)**	0
Potassium (mg/l)	4	**Sulfate (mg/l)**	91
Sodium (mg/l)	38	**Chloride (mg/l)**	5.9
		Bromide (mg/l)	
		Nitrate (mg/l)	3.1
		Hydroxide (mg/l)	
		Phosphate (mg/l)	
		Boron (mg/l)	0.33
		Iron (mg/l)	0.03
		Manganese (mg/l)	
Trace Elements			
Selenium (ug/l)		**Lithium (ug/l)**	
Lead (ug/l)		**Molybdenum (ug/l)**	
Mercury (ug/l)		**Strontium (ug/l)**	
Arsenic (ug/l)		**Cadmium (ug/l)**	

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General Info			
Date Sampled	2007-05-22	**Downhole Temp**	
Time Sampled	21:30:00	**Dissolved O2**	
Pump Time	30	**Field Conductivity**	
Yield	2	**Field pH**	
Water Level	13.13	**Field Temp**	
Sampling Method	A	**Lab Conductivity**	5210
Stage		**Lab pH**	7.67
Surface Depth	0	**Lab ID**	07-G496
General Characteristics			
Suspended Solids (mg/l)		**Alk. as CaCO3**	289.
TDS Determined (mg/l)		**SAR**	2.44
TDS Calculated (mg/l)	3230	**RSC**	0.
Hardness	1890	**Percent Sodium**	21.9
Non-Carbonate Hardness	1600		
Major Cations and Anions			
Silica (mg/l)		**Flouride (mg/l)**	0.190
Calcium (mg/l)	401.	**Bicarbonate (mg/l)**	353.
Magnesium (mg/l)	215.	**Carbonate (mg/l)**	<1
Potassium (mg/l)	8.31	**Sulfate (mg/l)**	103.
Sodium (mg/l)	244.	**Chloride (mg/l)**	1600
		Bromide (mg/l)	
		Nitrate (mg/l)	0.13
		Hydroxide (mg/l)	<1
		Phosphate (mg/l)	
		Boron (mg/l)	
		Iron (mg/l)	0.456
		Manganese (mg/l)	6.17
Trace Elements			
Selenium (ug/l)		**Lithium (ug/l)**	
Lead (ug/l)		**Molybdenum (ug/l)**	
Mercury (ug/l)		**Strontium (ug/l)**	
Arsenic (ug/l)		**Cadmium (ug/l)**	

North Dakota State Water Commission | 900 East Boulevard Avenue, Dept 770 | Bismarck, ND 58505-0850

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Microbiological Contaminants

Cyanobacteria

Algae that builds up in large livestock tanks or ponds may be due to a specific species known as cyanobacteria (sometimes called blue-green algae). It responds to sunlight and appears in stagnant water during hot, dry weather.

Signs of cyanobacteria toxicity in livestock are diarrhea, lack of coordination, labored breathing and death.

For additional information on blue-green algae poisoning, refer to NDSU Extension publication V1136, "Cyanobacteria (Blue-Green Algae) Poisoning."

Other Microbiological Properties

Many water sources contain microorganisms. Most microorganisms are [illegible]e harmless, but some do cause [illegible]mal health problems.

Coliform counts below 50 per milliliter of water are safe for all cattle. Other possible contaminants include bacteria, parasites and viruses that will not be reflected in the coliform count.

Microorganisms can enter a well that has improper surface protection. A well is situated improperly if it receives drainage from livestock pens or a manure storage structure. Cracked well casings also may allow bacteria to enter the water supply. Contamination also may occur from a heavy spring rainfall. In addition, trotect the surface of wells from contamination by rodents.

Chemical Contaminants

Many other chemicals, some of which could be detrimental to livestock production, may be found in water. Safe levels of herbicides and pesticides in water for animals have not been determined. Fish are more sensitive to pesticides than other livestock.

Herbicides and pesticides can enter a ground water or surface water supply from runoff, drift and accidental spills. Provide adequate drainage around the water supply. Wells should be on elevated ground to prevent surface runoff in to the well.

Industrial Products

Livestock often coexist in the same environment with industrial development. Livestock producers need to be aware of sources of industrial contaminants, particularly petroleum related, that can be released to the environment, especially water sources.

Animals can be exposed to fresh and weathered crude oils, refined hydrocarbons (for example, gasoline, diesel fuel and other petroleum-based products), concentrated and diluted hydraulic fracturing ingredients, glycols (for example, ethylene and diethylene glycols), methanol, produced water (brine or formation water) and oil field wastes.

The sources of these exposures may occur from pipeline spills, broken equipment and offsite leaching, inadequate or broken fences and accidents. Livestock, particularly cattle, are curious and often will explore novel sites and ingest contaminated water, soil and forages. Cattle actually will seek out and ingest petroleum hydrocarbons and lead-containing batteries, and lick at greases and salty-tasting contaminants.

Acute and chronic clinical signs occur in livestock following significant petroleum ingestion. Signs may include diarrhea or constipation, bloat, poor rumen motility, nervous system signs (tremors and seizures or incoordination and depression), and poor appetite with chronic wasting and marked weight loss. Respiratory signs, including rapid, shallow breathing, coughing and pneumonia, often occur.

Following ingestion of moderate to large amounts of hydrocarbons, animals may vomit and aspirate contents into lungs and subsequently develop aspiration pneumonia. Reproductive effects have been reported with petroleum hydrocarbon toxicity, including abortions, dystocia, poor mothering and abnormal development.

In addition to reproductive and production losses, death can occur days after petroleum hydrocarbon exposures. Immune suppression and secondary infections also are associated with livestock losses due to petroleum hydrocarbon toxicoses.

If exposure to industrial contamination is suspected, immediately remove livestock from the contaminated area to stop further exposure. Provide the animals with uncontaminated fresh water and adequate feedstuffs. Contact a veterinarian. The local veterinarian, often in contact with specialists with experience with toxicants, can diagnose and initiate a treatment program.

With significant petroleum product releases to the environment, the state departments of oil and gas and environment, and the state veterinarian are notified and will begin assessment of the contaminated environment and may assist with assessment of the animal condition.

Do not allow livestock to return to contaminated areas until appropriate cleanup procedures are taken for protection of livestock. Long-term monitoring of contamination in the environment may be required to protect livestock.

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Livestock Water Quality

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Water is an important, but often overlooked, nutrient. Livestock water requirements are affected by many factors, including size, productivity, diet and environmental conditions. Good water quality and cleanliness can increase water intake and improve livestock production.

Composition of Water

Water quality and quantity may affect feed consumption and animal health. Low-quality water normally will result in reduced water and feed consumption. Substances that may reduce palatability of water include various salts.

Salts may be toxic at high levels. Substances that are toxic without much effect on palatability include nitrates and fluorine, as well as salts of various heavy metals. Other materials that may affect palatability or toxicity include pathogenic microorganisms.

pH

Water pH denotes alkalinity or acidity. High-saline water is not the same as alkaline water. A pH of 7 would be neutral; a number higher than 7 indicates alkalinity; below 7 designates acidity.

Most North Dakota waters are mildly alkaline, with a pH value between 7 and 8. Acidic water (pH below 7) is not common in most of North Dakota; however, some reports indicate acidic water in the western part of the state in proximity to lignite coal veins.

High alkalinity may cause digestive upsets, laxative action, poor feed conversion, and reduced water and/or feed intake.

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Total Dissolved Solids and Salinity

Salinity refers to salt dissolved in water and is expressed as parts per million (ppm) or as milligrams per liter (mg/L). The term "total dissolved solids" (TDS) often is used to denote the level of water salinity. TDS is a nonspecific indicator of water quality. TDS levels should not be used as the only measure of water quality.

Specific water components should be measured to determine suitability for specific applications. Salts commonly present include carbonate, bicarbonates, sulfates, nitrates, chlorides, phosphates and fluorides.

Highly mineralized waters (high solids) may not impact health parameters because cattle do seem to adapt. However, pipeline breaks and produced water or brine water spills are not uncommon in rural environments. These contaminants can include very high concentrations of salts, from several thousand to more than several hundred thousand ppm (milligrams/kilograms) of salt, especially sodium chloride.

Higher salt concentrations in water actually may increase water consumption; however, concentrations that lead to refusal to drink can lead to overconsumption when animals become too thirsty. Animals will have differing tolerance levels to salt content, depending on species, age, season of the year and physiological condition.

Generally, animals will tend to avoid high-saline water sources but will ingest poor water if it is the only water source available. Clinical signs of salt poisoning are weakness, dehydration, tremors, aimless wandering, ataxia, seizurelike activity, partial paralysis and death. The prognosis is guarded in animals with clinical signs from salt toxicity. Cattle can die within 24 hours after the appearance of severe clinical signs. Treatment is available for salt poisoning in animals, so contact your local veterinarian.

When animals have clinical signs from exposure to high concentrations of salt, avoid giving the animals access to all the fresh water that they will drink. Slowly return the animals to normal water hydration during a two- to three-day period. For large animals, water intake should be limited to 0.5 percent of body weight at hourly intervals until hydration is normal.

Table 1 shows the health effects associated with the consumption of different levels of total dissolved solids.

Sulfates

High levels of sulfates can impact livestock health. Ruminants are especially susceptible. Sulfate recommendations are less than 500 ppm for calves and less than 1,000 ppm for adult cattle. High levels of sulfate can reduce copper availability in the diet. If copper deficiency is suspected, water sources should be analyzed for sulfates.

Use caution in evaluating sulfate levels in water because of interactions with copper and molybdenum. Elevated levels of sulfates may cause loose stool, whereas very high levels of sulfate can induce central nervous system (CNS) symptoms. High levels of sulfates also may contribute to and increase incidence of polioencephalomalacia (PEM), a brain disorder found in cattle.

Other Minerals

Water hardness is caused by calcium and magnesium. Softening the water through an exchange of calcium and magnesium with sodium may cause problems if the water already is high in salinity.

When a significant amount of calcium is in water, it should be considered as a part of total mineral intake. However, many mineral salts are relatively insoluble and pass through the body without being absorbed. Even in hard water, the amount of mineral ingested from the water is not likely to be substantial.

Nitrates

Water may be a source of toxic levels of nitrate for livestock. Water may become contaminated by fertilizer, animal wastes or decaying organic matter. Shallow wells with poor casings are susceptible to contamination.

Marginally toxic levels of nitrate in water and feed together may cause nitrate toxicity in animals. Remember to consider both sources of nitrate.

For more information regarding nitrates and nitrate poisoning, refer to NDSU Extension publication "Nitrate Poisoning of Livestock" (V-839 Revised).

Table 1. Recommendations for livestock water used based on total dissolved solids (TDS).

TDS (ppm or mg/L)	Comments
< 3,000	Usually satisfactory for most livestock
3,000-5,000	May not cause adverse effects to adult livestock. Growing/young livestock could be affected by loose stool or poor feed conversion. Levels near 5,000 ppm are unacceptable for poultry.
5,000-7,000	Should not be consumed by pregnant or lactating females. Usually a laxative and may result in reduced water intake
7,000-10,000	Do not use for swine. Do not use for pregnant or lactating ruminants or horses.
> 10,000	May cause brain damage or death

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Livestock Water Quality Testing

Table 2 lists the safe levels of potentially toxic nutrients and contaminants in water for livestock. These should be analyzed only when you have good reason to suspect their presence at excessive levels.

Annual testing of livestock water sources is recommended, particularly: 1) if using shallow water sources (ponds, sloughs and shallow wells), 2) during drought and 3) if you suspect a problem with water quality. Depending on the type of testing, a private individual may be able to take a water sample for water testing or the sample could be taken by a qualified individual for a specific set of tests.

Sample bottles may be available from a laboratory for use in specific tests or, in some cases, empty distilled water or water bottles could be rinsed with water from the suspect source and used to collect a sample. The container should be sealed with tape. The best approach is to contact the testing laboratory to determine the sampling and handling procedures for the requested tests.

Often water testing needs to be performed within a specified time period, so keep in mind transportation to the laboratory when taking water samples.

Table 2. Safe levels of potentially toxic nutrients and contaminants in water for livestock.

Element	Safe Upper Limit of Concentration
	(ppm or mg/L)
Aluminum	5.0
Arsenic	0.2
Barium	10
Cadmium	0.05
Calcium	1,000
Chromium	1.0
Copper	0.5
Fluoride	2.0
Lead	0.1
Molybdenum	0.5
Nickel	1.0
Nitrate	100
Nitrite	33
pH	5.5 to 9.0
Selenium	0.05
Sodium	1,000
Sulfate	500 to 1,000
Vanadium	0.1
Zinc	25.0

Water analyses for livestock typically include:

- Total dissolved solids or salinity
- pH (acid or alkaline value)
- Nitrates
- Sulfates
- Additional factors associated with toxicity problems such as mineral or metal concentrations, pesticides, petroleum hydrocarbons or oil field chemicals, or perhaps harmful blue-green algae identification (or algal toxin determination)

No legal limits have been established for bacteria, or more specifically coliform bacteria, in livestock water except for dairy operations (Grade A dairies). For dairy operations, the water supply must be tested microbiologically safe for use by an approved laboratory.

Many commercial laboratories and the NDSU Veterinary Diagnostic Lab provide testing for livestock water quality and specialized testing.

Contact an NDSU Extension office for a list of commercial laboratories in the state.

If concerned about livestock disease caused by contaminated drinking water, contact your local veterinarian, the NDSU Extension veterinarian or the NDSU Veterinary Diagnostic Laboratory for a specialist.

NDSU Extension Veterinarian

(701) 231-7641

NDSU Veterinary Diagnostic Lab

(701) 231-8307

Cover photo by Miranda Meehan

For more information on this and other topics, see www.ag.ndsu.edu

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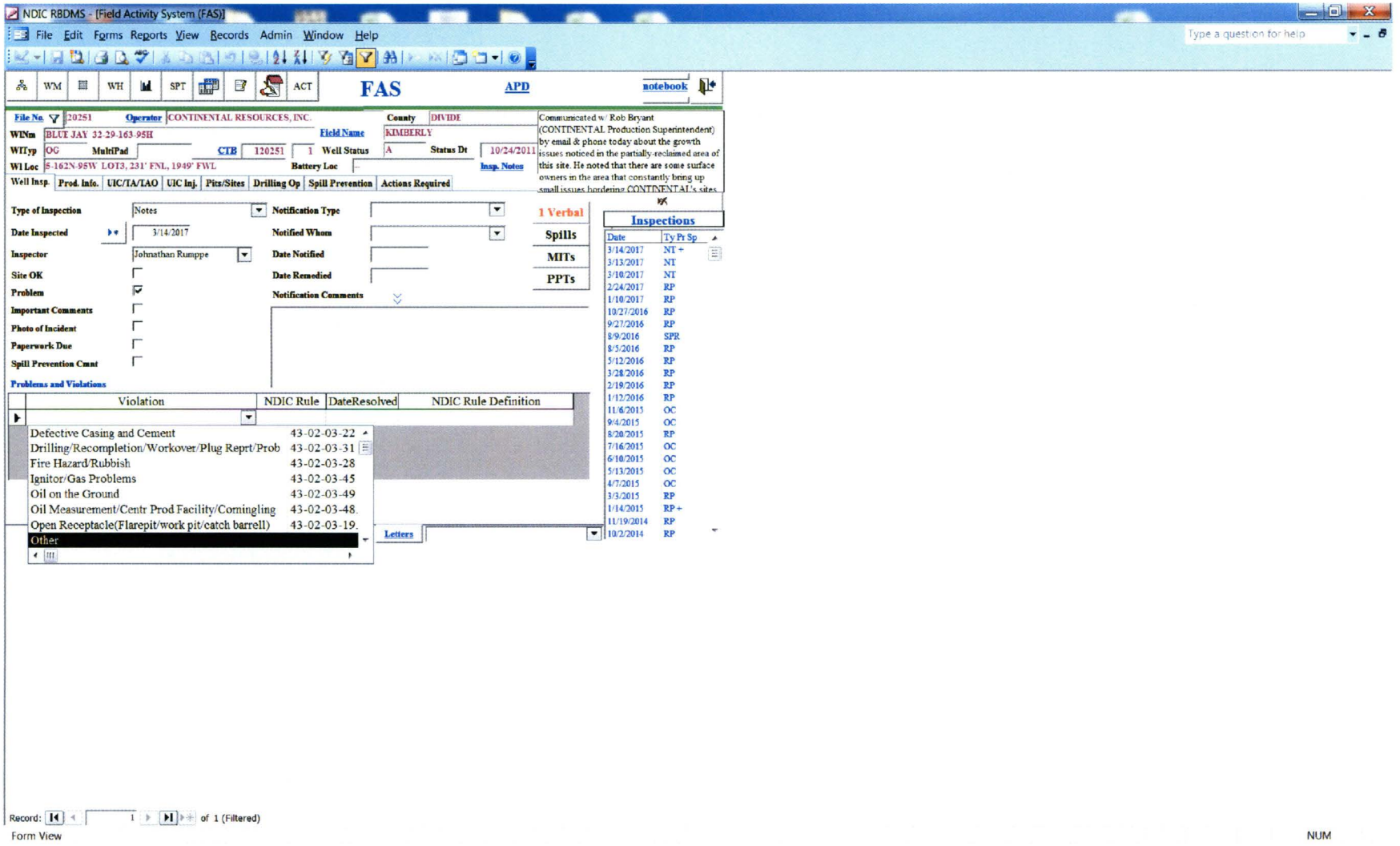

Fr: Lynn Helms

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