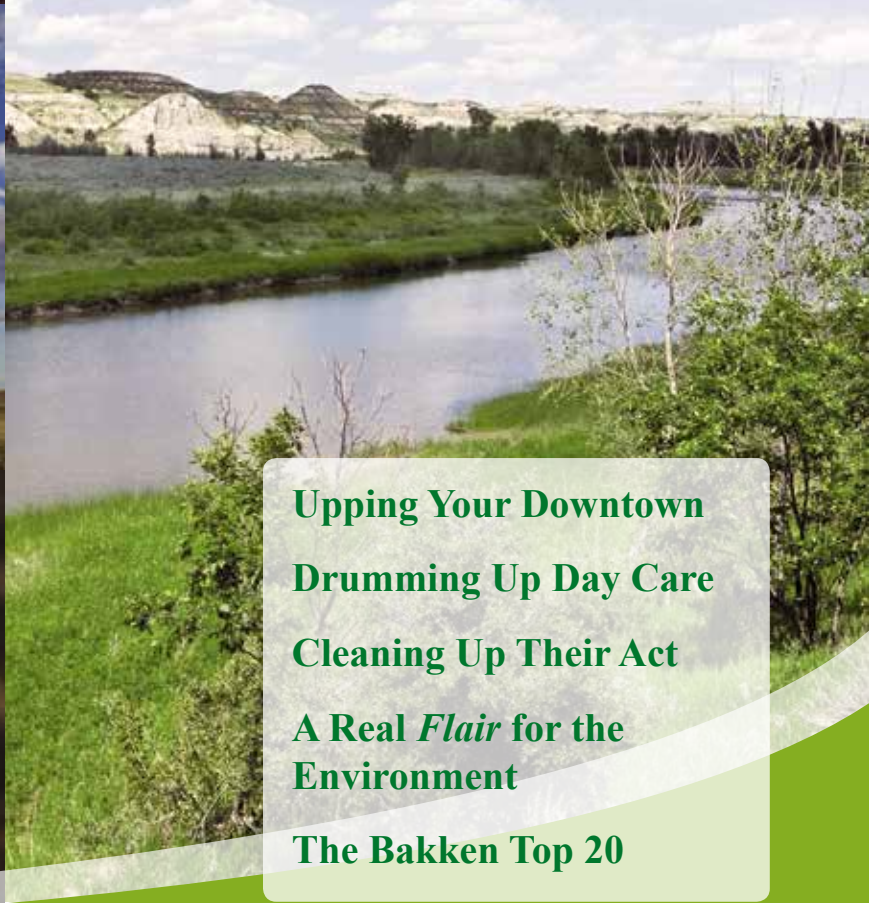
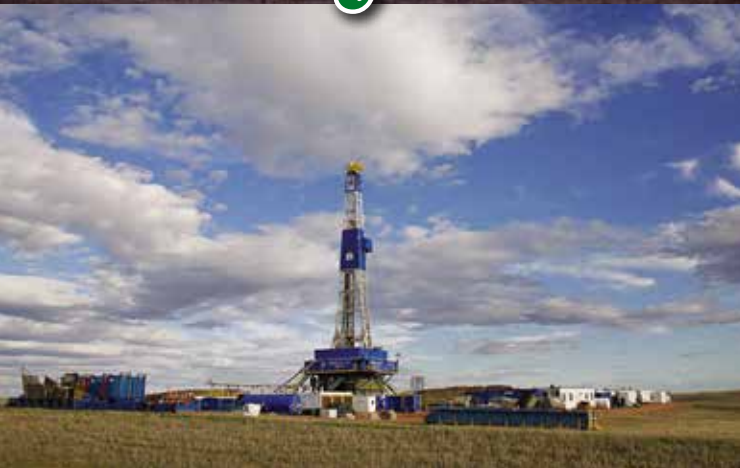


Spring 2013

BASIN BITS

The Official Publication of the North Dakota Association of Oil & Gas Producing Counties

Bakken Bucks Beyond the Border



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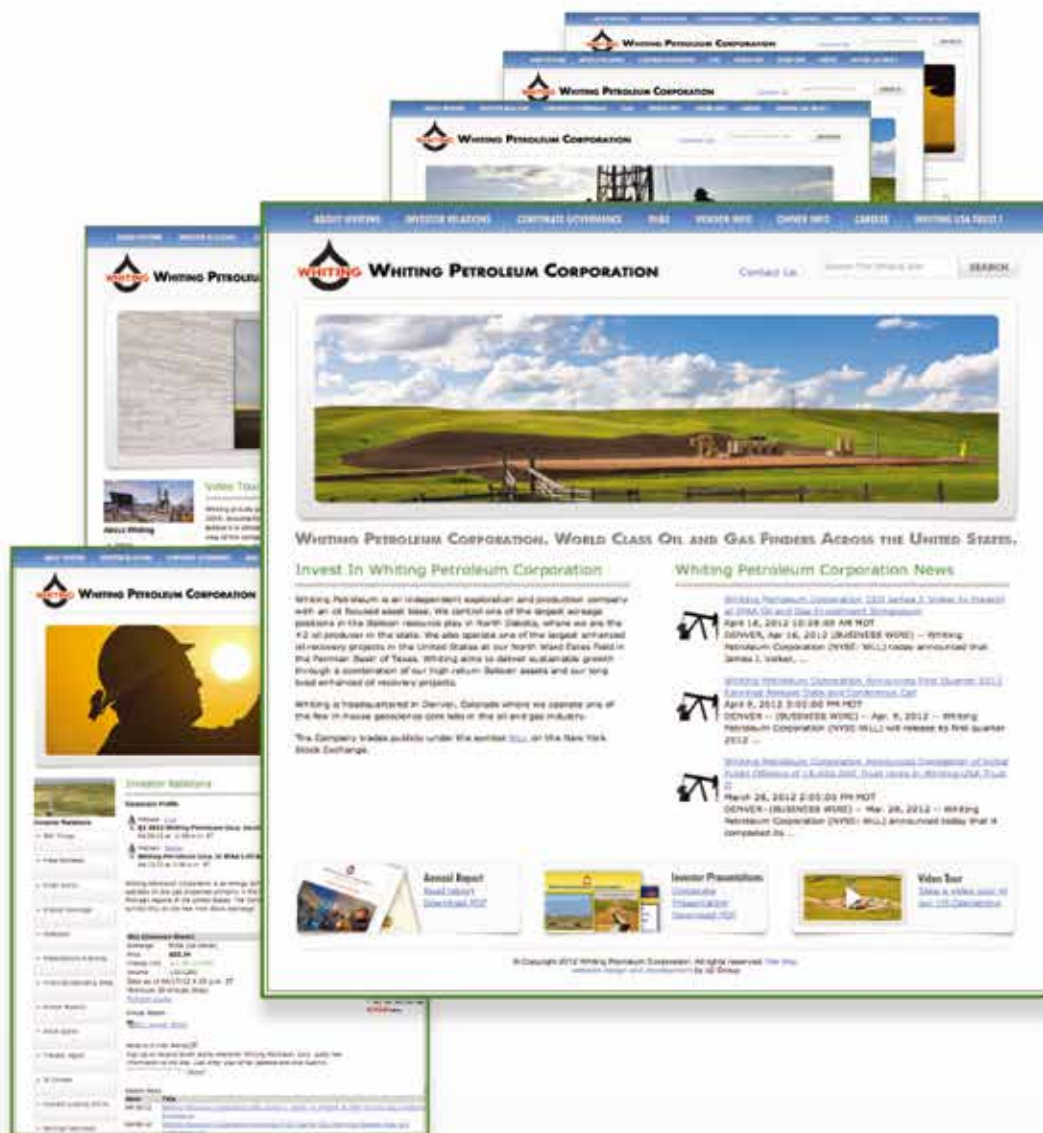
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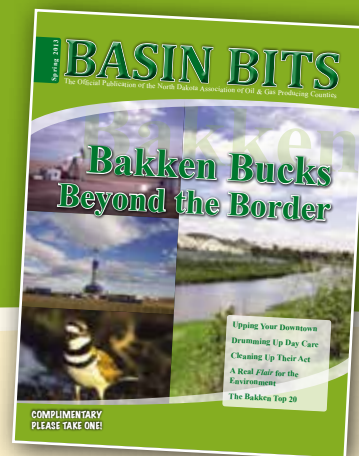
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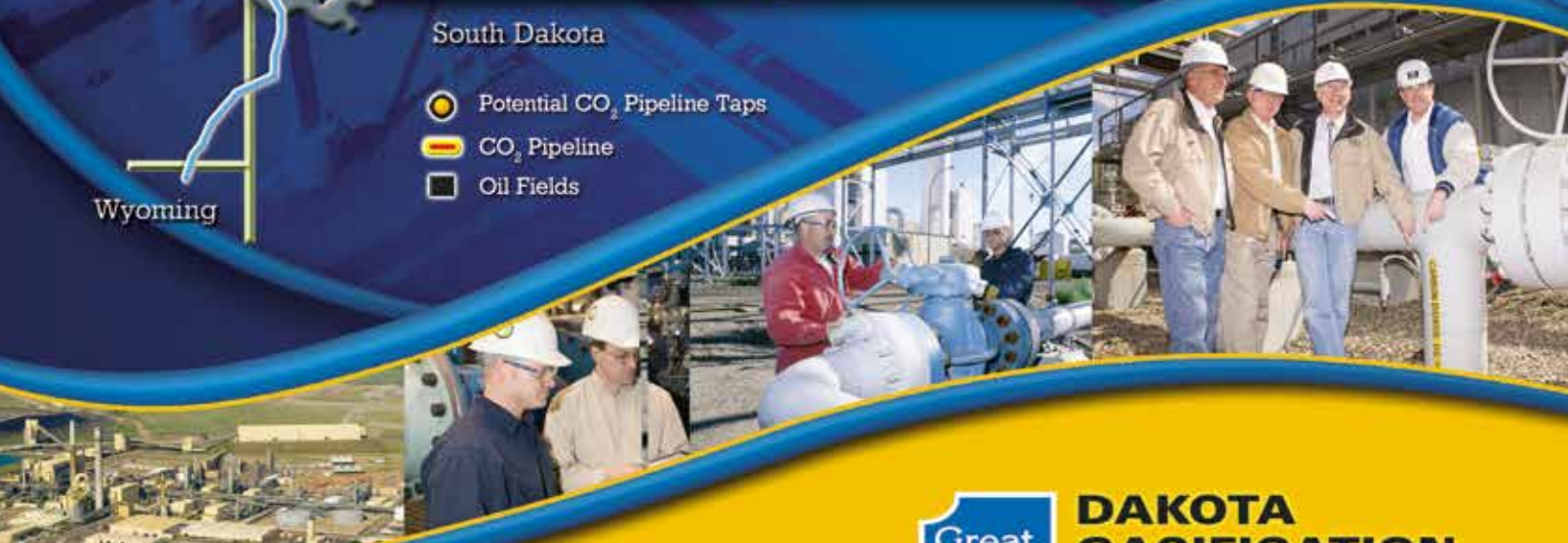
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From the Desk of the North Dakota Association of Oil & Gas Producing Counties' President



Dan Brosz
President
North Dakota Association of
Oil & Gas Producing Counties

*These hub cities
need tens of millions
of dollars to address
the needs to develop
the Bakken.*

By the time you read this message, the 63rd session of the North Dakota Legislature will have come to an end. This session is critical if the infrastructure and services needed to develop the Bakken are to be met. Several items before the Legislature will have a large impact on our members; the largest of these items is a formula change to the Gross Production Tax (GPT), which distributes oil and gas tax dollars back to the local political subdivisions in the oil producing counties.

The association has been participating in studies and hosting the governor and his staff and legislative members on tours of western North Dakota to educate them as to the impacts we are facing. The outcome of this effort has brought us to the conclusion that we need an increase in funding—one that is predictable and steady to meet our impacts.

The last legislative session increased funding though grants distributed by the Energy Impact Office and Department of Transportation. These monies were greatly appreciated and were put to great use building roads, sewer and water expansions, and emergency service needs. We now are waiting for the Legislature to decide the amount of funding we will receive over the next two years. This process makes for difficulties in planning and proceeding with the construction of much-needed infrastructure.

A formula change giving more of the money collected in the GPT back to the local political subdivisions will help in the planning process as well as the implementation of that planning. By receiving a larger portion, local political subdivisions will know from year to year what money will come from the formula; they will not have to wait for a decision from a board for a grant. Counties can plan roads a year in advance and bid the project in the winter to get the best price possible. The needs are many, and getting the most for the dollar spent will help get more projects completed.

Cities can also plan in advance and bid projects early, and they can also use some of these funds to leverage bond sales. Some of the cities do not have a large enough tax base to bond for the improvements and expansions needed to serve the growing population. A predictable long-term funding source can help in this process.

The larger cities of Williston, Dickinson, Minot, and possibly Mandan and Bismarck, are at the hub of the oil development. The amount of funding these cities need cannot be met with the current GPT formula. We are asking the Legislature to change the formula to fund them separately from the GPT share which goes to the general fund. These hub cities need tens of millions of dollars to address the needs

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ABOUT THE NORTH DAKOTA ASSOCIATION OF OIL & GAS PRODUCING COUNTIES

The North Dakota Association of Oil & Gas Producing Counties (NDAOGPC) is the trusted and unified voice for the betterment of the citizens of North Dakota and the membership of the North Dakota Association of Oil & Gas Producing Counties.

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to develop the Bakken. The smaller cities and towns in the counties in which these hub cities are located will also benefit if we change the method of funding for the hub cities. Distribution is based on population, and the large disparity in populations causes large disparity in funding.

Schools need the caps removed from their funding in order to receive a more reliable and steady funding source. Our association has funded a study through North Dakota State University to help plan for increased enrollment as this oilfield develops. The short-term needs are books, desks and

teachers. The long-term needs will be buildings to house all of these new students. Presently, the schools are enrolling new students almost daily; there are also students leaving on a daily basis as the workforce is transient. The trend will change when the permanent workforce grows to maintain the wells and operate the gas plants, pumping stations and other assets necessary to produce, process and deliver the oil and gas from the Bakken.

The association is working hard with the Legislature, the governor and his staff, as well as with the industry, to build the infrastructure and provide the services needed to develop the Bakken. 

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ENERGY ON THE MOVE

From the Desk of the North Dakota Association of Oil & Gas Producing Counties' Executive Director



Vicky Steiner
Executive Director
North Dakota Association of
Oil & Gas Producing Counties
North Dakota House Representative
for District 37, Dickinson, ND

“North Dakota saw unprecedented growth as the state’s oil well country outpaced Alaska . . . oil tax revenues filled trust funds and put the state on the national map.”

“If we had no winter, the spring would not be so pleasant; if we did not sometimes taste adversity, prosperity would not be so welcome.” —Anne Bradstreet

Spring in North Dakota announces the end of the bitter cold. Not the cold as we may see a spring storm in May, but in spring, the snow retreats quickly in defeat. Our state takes a collective sigh knowing that the face numbing winds are just a memory.

Spring is my New Year’s Eve. I start making all kinds of resolutions. The birds are building nests with an enthusiastic optimism that is quite contagious.

My first resolution is always that I will start walking early in the morning. I see myself out walking at 5:00 a.m. every morning with the neighbor’s dog, Dixie. That’s actually never happened, but like the robins, I’m optimistic.

It must be the warmth of the sun or the bright blue skies. This year, my new resolution will be to take my new hand-painted minnow that I bought in January and see if I can catch the same fish I’ve seen only in my daydreams. I caught four fish last fall just before freeze up—a small walleye, a fat catfish, a northern and a smallmouth bass. I’m dreaming that the big walleye will not break the line when he

dives under the boat and my minnow will be successful.

This spring and summer bring not only fishing adventures, but for those of us who live and work in the Bakken oil field region, we will hear the sound of commerce—hammers, trucks, trains and new voices. New hotels will be built. North Dakota’s state oil and gas director, Lynn Helms, projected another 200,000+ population will be coming in and around the production fields of the Bakken. Helms also predicted that the rig count could swing from 150 to 225; but when it dropped to 181, people did take notice. There was a slowdown in December 2012 but the pace picked up in the first quarter of 2013.

When the legislature adjourned in 2011, the state had forecast an ending fund balance of \$55M. The actual ending fund balance was over \$1.5B. North Dakota saw unprecedented growth as the state’s oil well country outpaced Alaska during that time. The oil tax revenues filled trust funds and put the state on the national map. Our state finally had its time in the sun and for good reason.

There are at least three factors that contributed to that success:

- 1. Resource.** The oil and gas industry pumped \$2B per month into the state’s economy last summer. Fortunately, North Dakota was blessed with the Bakken resource and blessed to have an industry with the talents to retrieve it.
- 2. Opportunity.** Opportunity comes in several forms. Lawmakers here are quite careful to build tax structures that are fair so that the industry remains interested, not discouraged. It is a challenge for non-oil company businesses to compete for the labor market here, so some of those businesses have built their own apartments to meet that issue.
- 3. Luck.** The rest of the country took a bad bounce and people were looking to survive. North Dakota could not compete with fair weather states if jobs were readily available, so we got lucky. We had 30,000 strangers to North Dakota make their way here and they found work. So what will spring bring to the Bakken? One million barrels of production per day, another 200,000 people, bringing our population closer to one million; is that what spring will bring?

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I think those opportunities are both known and unknown. Sometimes they unfold right before your eyes, just like volunteer purple pansies on my neighbor's boulevard.

If you are an entrepreneur, North Dakota is a great place to be. The public has the perception that the oil industry spends and spends, throwing money here and there, willy nilly. After all, it does cost about \$9M to drill a Bakken oil well. I don't think they waste much money, at least not the successful ones.

They might lose a tool down an oil well hole, but that's part of the cost of their experiment. From my outside observation, they are efficient money machines. They worry about their return on investment every day. If you have a product that saves them time or money, they are interested.

Rep. George Keiser, Bismarck, ND told the House of Representatives in late February that he believes there are more entrepreneurs working in North Dakota than in the rest of the country. I believe he's right. Entrepreneurs solve problems and they are rewarded in North Dakota when the growth is so unprecedented.


The North Dakota House of Representatives passed legislation in February to give energy companies incentive to use the flared gas. It was hoped that this would spur new technologies and encourage new uses for the product—some of which, you can read about on page 102 of this magazine. Perhaps it could someday be used to fuel the trains that carry the oil to west and east coast markets.

In January, ONEOK Partners announced plans to invest an additional \$465M to capture and process natural gas liquids bringing their total investment to \$4.7-5.3M. MDU also announced its plans to build a diesel refinery west of Dickinson, ND.

On the pie chart of Williston Basin crude oil transportation, rail transportation takes first place at 58 per cent. When the Bakken first got its legs, people said the rail was too expensive and it would never work; it must be working. Pipeline takes away another 32 per cent. For this spring, it's predicted that truck traffic will begin to stabilize, and that work on pipelines of all types—oil and water—will soar compared to last year.

With local and state investments in infrastructure, planning and determination, I expect we'll get there from here.

It'll be a busy one again, so be sure to take time and see the glory of spring.

I hope to actually be at the lake for a spring weekend and see if that hungry walleye will make a run under the boat. I'm ready. 

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Technologies that work in the field

A Message from the North Dakota Department of Mineral Resources



Stephan Nordeng, Ph.D.,
North Dakota Geological Survey
North Dakota Department of
Mineral Resources

Finding the source beds in the Red River is one challenge; attempting to gauge whether or not the source beds have (or are) generating oil is another.

New Twists in the Exploration for Red River Oil

The extraordinary oil development in North Dakota has put the Bakken Formation in the national and international spotlight. However, a developing Red River play in North Dakota's Williston Basin may be the harbinger of significant new discoveries beyond the Bakken.

Historically, the Red River Formation has produced over 100 million barrels of oil, making it the third most prolific oil producer in North Dakota. Much of this oil was produced from fields that line up along the crest of the Cedar Creek anticline. The Cedar Creek anticline trends from the southeast to northwest and extends from northwestern South Dakota through Slope and Bowman counties in southwestern North Dakota and into southeastern Montana. Most of this production was from poorly permeable porosity zones found in the upper half of the Red River Formation. Because of the low permeability of these porosity zones, economic rates of oil production could only be established using horizontal drilling methods.

Aside from the application of an "unconventional" drilling technology,

production from the Cedar Creek anticline was, from the geologic standpoint, largely conventional. That is to say, the accumulation was the product of oil generation somewhere in the deeper parts of the basin followed by oil migrating to places where porous zones had been "bent" into folds that force oil to "pool" along the top of these structures.

Even though most Red River oil comes from the Cedar Creek anticline, additional Red River fields are scattered across the central part of the Williston Basin. Most of these fields are "conventional" in that the oil is found in small one or two well fields that are drilled vertically into local structural highs known as Red River "bumps." Even though these features are typically small, they can be detected using seismic methods.

Until fairly recently, the geologic model used to develop the Red River Formation has been largely conventional; however, new ideas concerning the role of oil migration and the necessity of structural traps appear to be changing. Taking the lead from the Bakken Formation, some explorationists are looking at porosity zones in the lower portion of the Red River that are interbedded with organic

rich-source rocks. In those parts of the basin where subsurface temperatures are great enough to generate oil, porous rock close to the source beds has retained some of the oil generated, resulting in accumulations that are not associated with structural highs.

If this is indeed prevalent, then a significant portion of the Williston Basin could contain accumulations beyond those contained within structural "highs." This new exploration model is similar to the one used to develop the Bakken Formation in that these accumulations exist because they are close to oil generating source beds. The two organic-rich source beds in the Bakken Formation are typically much thicker and continuous over a large part of the Williston Basin, whereas the organic-rich source beds in the Red River are thinner and probably discontinuous.

Even though individual Red River source beds are thin, there are frequently several of them sandwiched between the limestone and dolostone layers that make up the remainder of the formation. The total thickness of these source beds may be close to the thickness of at least one of the Bakken source beds. If so, then the total oil generation capacity of the Red River

Formation could be similar to the Bakken Formation.


Unlike the Bakken Formation, determining the total thickness of source beds in the Red River is not easy. Like many source beds, deposition of organic matter in the two Bakken shales coincided with deposition of relatively large amounts of uranium. Consequently, radioactive decay of uranium in the organic-rich shales produces gamma rays that are easily detected and allow for accurate thickness measurements of the Bakken source beds; this is not the case with the Red River. Source beds within the Red River often contain as much, if not more, organic matter as the Bakken Formation.

However, when the organic matter was originally deposited, the prevailing chemical conditions prevented uranium deposition. Because the source beds are no more radioactive than the surrounding limestone and dolostone, gamma ray logging tools are of little help in identifying source beds. However, Red River source beds can, with care, be identified using logs that respond to rock density and "stiffness."

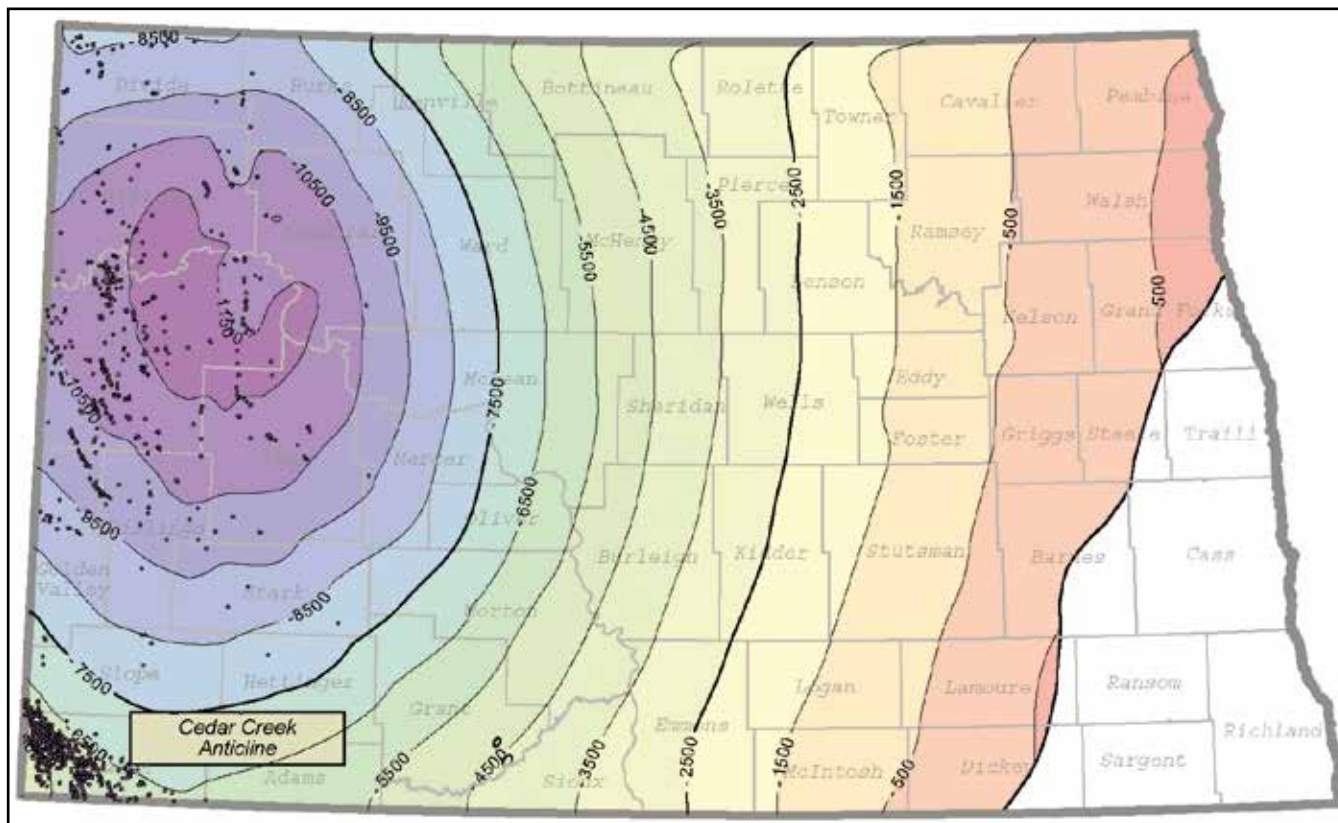
Finding the source beds in the Red River is one challenge; attempting to gauge whether or not the source beds have (or

are) generating oil is another. The reason for this is that the organic matter in the Red River comes from at least two different types of organic matter. Each type of organic matter generates its own distinctive set of individual hydrocarbons so that any particular oil accumulation may contain a range of different hydrocarbons.

This is significant because differences in the original type of organic matter usually translate into differences in the temperature needed to generate oil. If the critical generation temperature is significantly different, then the range of corresponding depths will also vary significantly. Consequently, the "oil window" that corresponds with intense oil generation may range over significant depths or be fragmented into more than one, depending on the type of organic matter that is involved. What this may mean is that the porosity zones that fill with the oil generated in the nearby source beds may also be complexly distributed with depth.

These are only a couple of challenges facing the explorationists working the Red River. With time and experience, new production from the Red River will occur and, if the past is any key to the future, with some interesting surprises. 

A map of North Dakota showing the location of wells producing from the Red River Formation (green circles). The color-filled contours show the extent and elevation of the Red River Formation.



TRIVIA TIME

DID YOU KNOW?

The North Dakota Geological Survey (NDGS), created in 1895, serves as the primary source of geological information in the state. Its mission is to investigate the geology of North Dakota, to administer regulatory programs and act in an advisory capacity to other state agencies, and to provide public service to the people of North Dakota.

The Geological Survey and the Oil and Gas Division are in the Department of Mineral Resources (DMR) and under the North Dakota Industrial Commission. The NDGS's Wilson M. Laird Core and Sample Library at the University of North Dakota houses 375,000 feet of core and 30,000 boxes of drill cuttings from oil and gas wells.

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Your Guide to the 21st Williston Basin Petroleum Conference

New Energy Horizons

April 30-May 2, 2013, Regina, SK, Canada

The 21st Williston Basin Petroleum Conference is gearing up to be one of the best conferences yet! Things kick off on April 30 at Evraz Place – Credit Union Eventplex in Regina, SK, Canada and wrap up on May 2, 2013. The theme of the 2013 conference is New Energy Horizons. With room for 300 exhibition booths, indoor and outdoor space for bigger equipment exhibitions, and high quality technical sessions, the conference will be an excellent opportunity for everyone to expand his/her knowledge about the Williston Basin, to discuss new technologies and to network with those who are making the Williston Basin one of the major driving forces in the oil industry today!

THE 21ST WILLISTON BASIN PETROLEUM CONFERENCE TENTATIVE AGENDA

Tuesday, April 30, 2013		
8:00 a.m. – 5:00 p.m.	Exhibitor Move-in	Evraz Place – Credit Union Eventplex
8:30 a.m. – 1:00 p.m.	Core Workshop 1 <i>Lunch included with course registration</i>	Subsurface Geological Laboratory, 201 Dewdney Avenue E., Regina
12:00 p.m. – 1:00 p.m.	Core Workshop Lunch	Subsurface Geological Laboratory
12:00 p.m. – 5:00 p.m.	Exhibitor Registration/Pick-Up	Evraz Place – Credit Union Eventplex
1:00 p.m. – 6:00 p.m.	Poster Presentation Set-Up	Evraz Place – Credit Union Eventplex
12:00 p.m. – 4:45 p.m.	Core Workshop 2 <i>Lunch included with course registration</i>	Subsurface Geological Laboratory, 201 Dewdney Avenue E., Regina
6:00 p.m. – 9:00 p.m.	Conference Attendee Registration	Evraz Place – Credit Union Eventplex
6:30 p.m. – 10:00 p.m.	Ice Breaker in Commercial Display Area	Evraz Place – Credit Union Eventplex

Wednesday, May 1, 2013		
7:00 a.m. – 8:00 a.m.	Speakers' and Sponsors' Breakfast	Salon 2, Credit Union Eventplex
7:30 a.m. – 6:30 p.m.	Commercial Displays	Evraz Place – Credit Union Eventplex
8:00 a.m. – 5:00 p.m.	Conference Attendee Registration	Evraz Place – Credit Union Eventplex
8:30 a.m. – 9:50 a.m.	Presentations (One session)	Evraz Place – Credit Union Eventplex
9:50 a.m. – 10:30 a.m.	Coffee Break	Evraz Place – Credit Union Eventplex
10:30 a.m. – 11:30 a.m.	Presentations (One session)	Evraz Place – Credit Union Eventplex
11:30 a.m. – 1:30 p.m.	Lunch Break	Evraz Place – Credit Union Eventplex, Main Hall
12:30 p.m.	Keynote Speaker Luncheon	Evraz Place – Credit Union Eventplex, Main Hall
1:30 p.m. – 2:50 p.m.	Presentations (Three concurrent sessions including a public session)	Evraz Place – Credit Union Eventplex
2:50 p.m. – 3:30 p.m.	Coffee Break	Evraz Place – Credit Union Eventplex
3:30 p.m. – 4:30 p.m.	Presentations (Three concurrent sessions including a public session)	Evraz Place – Credit Union Eventplex
4:30 p.m. – 6:30 p.m.	Commercial Displays and Technical Posters <i>Cash Bar, Coffee and Snacks</i>	Evraz Place – Credit Union Eventplex

Thursday, May 2, 2013		
7:00 a.m. – 8:00 a.m.	Speakers' and Sponsors' Breakfast	Salon 2, Credit Union Eventplex
7:30 a.m. – 2:00 p.m.	Commercial Displays	Evraz Place – Credit Union Eventplex
8:00 a.m. – 12:00 p.m.	Conference Attendee Registration	Evraz Place – Credit Union Eventplex
8:30 a.m. – 9:50 a.m.	Presentations (Two concurrent sessions)	Evraz Place – Credit Union Eventplex
9:50 a.m. – 10:30 a.m.	Coffee Break	Evraz Place – Credit Union Eventplex
10:30 a.m. – 11:30 a.m.	Presentations (Two concurrent sessions)	Evraz Place – Credit Union Eventplex
12:00 p.m.	Keynote Luncheon Speaker	Evraz Place – Credit Union Eventplex
1:30 p.m. – 2:50 p.m.	Presentations (One session)	Evraz Place – Credit Union Eventplex
2:50 p.m. – 3:10 p.m.	Coffee Break	Evraz Place – Credit Union Eventplex
3:10 p.m. – 4:30 p.m.	Presentations (One session)	Evraz Place – Credit Union Eventplex
4:30 p.m. – 10:00 p.m.	Exhibitor Move-out	Evraz Place – Credit Union Eventplex

**Agenda is subject to change but is up-to-date as of publication of this magazine.*

21st Annual Williston Basin Petroleum Conference

WWW.WBPC.CA



The 20th Williston Basin Petroleum Conference. Photos in this layout provided by the Williston Basin Petroleum Conference.

TECHNICAL PROGRAMS

May 1, 2013, Morning: Government and Industry Outlooks and Updates

Keith Lowdon, Manitoba Innovation, Energy and Mines	Manitoba Oil and Gas Industry Outlook
Stephan Nordeng, North Dakota Department of Mineral Resources	South Dakota and Montana Oil and Gas Industry Outlooks
Dean Potter, Elkhorn Resources	Whirlwind Tour of Drilling Activity in the Williston Basin
Debby Westerman, Saskatchewan Ministry of the Economy	PRIME 2.0: What's Next for Saskatchewan Ministry of the Economy's Oil and Gas Business Process and Systems Renewal Project
Alison Ritter, North Dakota Department of Mineral Resources	North Dakota Oil and Gas Industry Outlook
Melinda Yurkowski, Saskatchewan Ministry of the Economy	Saskatchewan Oil and Gas Industry Outlook

May 1, 2013, Afternoon & May 2, 2013, Morning: EOR and Stimulation

Ryan Axani, PetroBakken	Fracture Avoidance in the Viewfield Crater Area: Case Study
Dan Kohlruss, Saskatchewan Ministry of the Economy	Well Stimulation Observations in the Viewfield Bakken Pool: What is the Production Telling Us?
Peng (Mars) Luo, Saskatchewan Research Council	Geochemical and Geophysical Implications of CO ₂ Flooding for Bakken Reservoirs
Janz Rondon, Schlumberger	Case Study: Channel Fracturing Provides Production Benefits While Reducing Risk and Using Less Resources
Jim Sorensen, Energy & Environmental Research Center	CO ₂ Enhanced Bakken Research Program: Summary, Status and Future
Neil Wildgust, Petroleum Technology Research Centre	Application of the PTRC's Enhanced Oil Recovery Research in the Williston Basin
Malcolm Wilson, Petroleum Technology Research Centre	Downhole Microsensors for Improved Hydrocarbon Recovery

May 1, 2013, Afternoon: Infrastructure

Trisha Curtis, Energy Policy Research Foundation, Inc.	How the Game has Changed: Infrastructure Challenges and the North American Petroleum Renaissance
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May 1, 2013, Afternoon & May 2, 2013, Afternoon: Exploration & Development

Stephen Bend, University of Regina	New Light Through Old Windows: A Geochemical and Petrographic Review of the Upper and Lower Bakken, Southern Saskatchewan
Nancy Chow, University of Manitoba	Resource Potential of the Devonian Winnipegosis and Duperow Formations in Southwestern Manitoba
Chris Hawkes, University of Saskatchewan	An Overview of Rock Mechanical Factors Affecting Petroleum Development in the Williston Basin
Tibor Lengyel, University of Alberta	Geothermics of the Phanerozoic Strata of Saskatchewan
Anatoly Melnik, WorleyParsons	Hydrogeology of Shaunavon Formation: Regional Evaluation of Hydrodynamic System and Hydrocarbon Migration
Tim Nesheim, North Dakota Geological Survey	Geology and Hydrocarbon Potential of the Black Island Formation, Winnipeg Group (Ordovician) in North Dakota
Cosima Theloy, Colorado School of Mines	Integration of Geological and Technological Aspects and Their Influence on Production in the Bakken Play, Williston Basin
Brian Zaitlin, NARP	An Emerging Unconventional Hybrid Light Tight Oil Play Within the Southern Alberta Bakken-Exshaw Petroleum System: A Comparison Between the Williston and Southern Alberta Basins



May 2, 2013, Morning: Emerging Technologies	
Matt Bjorum, Corpro	A New Coring Technology to Quantify Hydrocarbon Content and Saturation
Mitch Carlson, SaskEnergy	Natural Gas: The Competitive Advantage Over Traditional Fuels
Sean Frisky, Ground Effects Environmental	Frac Water Management Through ElectroPure™ Technology
Gary Hyer, CanGas Solutions	Flare Gas Capture: Lessons Learned
Raye Lahti, AMEC	Geophysical Methods Applied for Cost-Effective Site Assessments
Bernie Ryma, Engineering Consultant	Conservation of Associated Gas in Southeastern Saskatchewan: A Research Study for the Ministry of the Economy
Chad Wocken, Energy & Environmental Research Center	Utilization of Associated Gas to Power Drilling Rigs: A Demonstration in the Bakken

**Presentation list is subject to change as speakers and presentation titles are confirmed. This list is up-to-date as of publication of this magazine.*

PUBLIC SESSIONS (www.wbpc.ca/agenda/public-sessions)

May 1, 2013, Afternoon: Oil and Gas Basics	
Members of the general public and interested conference registrants are invited to attend a free public session to be held Wednesday, May 1, 2013 at 1:30 p.m. in Salon 1, Queensbury Convention Centre, to learn more about the oil and gas industry in Saskatchewan. Registration is NOT required for this session.	
David Hammermeister, MNP	Tax Planning for Freehold Mineral Owners
Bethany Kurz, Energy & Environmental Research Center	An Overview of Hydraulic Fracturing
John Styles, Auburn Energy	How to Get a Well Drilled and on Production
Saskatchewan Geological Survey	Petroleum Geology of Saskatchewan



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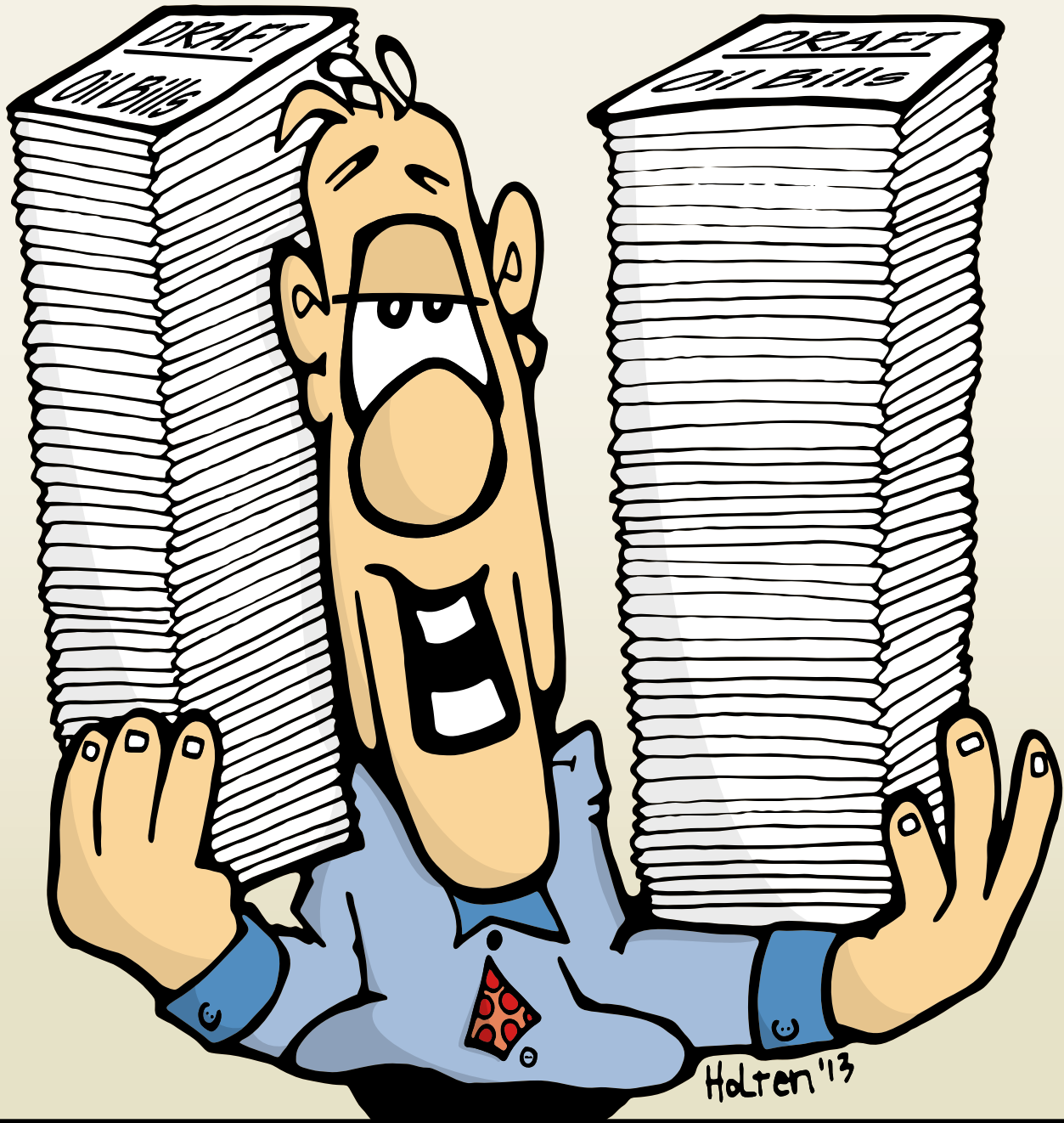
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"Looks like I've got my evening reading selection all set for the next 80 days."

Cartoonist Kevin Holten, holten24@gmail.com



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Bakken Bucks Beyond the Border



By Paul Adair

It is becoming common knowledge that America's growing focus in exploiting its vast domestic energy reserves is rapidly shaping the socio-economic dynamic of north-western North Dakota, bringing both benefits and challenges to the region.

As the Bakken boom continues to indicate no signs of slowing its pace, companies and municipalities from outside North Dakota are doing what they can to take advantage of the vast potential to be found in exploiting the region.

The city of Vermillion is almost as far as you can get from the play in the Bakken while still remaining in South Dakota. Situated on the southeast corner of the state, it hardly seems like a staging point for business in North Dakota's oil reserves.

Over 3,000 miles away, and based out of Anchorage, AK, the same could be said for custom modular manufacturer, Builders Choice. However, given the scope and magnitude of the Bakken boom, even locations this far out could feel its draw.

"Many of the customers that we build for here in Alaska are Houston-based," says Mark Larson, owner and president of Builders Choice. "When these companies started working in North Dakota, they already knew that we build a great product, so they told us that if we ever moved down there, they would continue to buy from us. That's the reason why we got started down there."

A familiar name and welcome sight to many working in the oil industry, Builders Choice makes modular housing for the Bakken region of North Dakota. "We manufacture what are called double-enders," says Larson. "They are units that have bedrooms at either end and share a common kitchen in the middle. They are mostly self-contained and portable, so they can be hauled on a trailer and moved between well sites along with the drill rig."

Builders Choice is known for the quality of their product, especially suited for the unforgiving North Dakota winter, where temperatures routinely dip below -40.

"Our roots are based in Alaska and in arctic construction," says Larson. "We have built for some of the most extreme climates that exist on the planet and we have built our reputation on building a high quality unit that will outshine, outlast and outperform what we have seen in our competition."

Once the decision was made to expand south to better meet the needs of the

Bakken, Builders Choice began the arduous search to find a location that offered the infrastructure they required to meet those needs.

"We actually started looking in Rapid City, SD but couldn't find a property that existed there which would work for us," says Larson. "What we needed was a factory and a building to work in where we could set up an assembly line. We needed a space where we could put up cranes and do the things that make it possible to build quickly and to manipulate huge components."

It was in Vermillion that they found what they were looking for. A city of 10,000, doubling in size during the school year, Vermillion offers a combination of availability, a skilled workforce and price.

What Vermillion also offered was a prime location. Being roughly 600 miles away from the epicenter of the oil boom allows Builders Choice to train and retain their workforce without fear of losing them to the Bakken—a problem that many companies situated closer to the action are facing.

"We figured that the extra few miles to ship product into the Bakken was a small price to pay to have access to good workers. Besides, a lot of the guys that are building product—who would be our competition—are even further away, so we think that we're in a great location," says Larson.

"The business climate in South Dakota has been phenomenal to us. The people that we are involved with, from the community level all the way up to the governor and his staff, have been encouraging us, helping us and being favorable to us since we got started just over a year ago."

Not only has the move to Vermillion been good for Builders Choice, the city has also benefited from the company setting up shop. For a farming community the size of Vermillion, an employer such as Builders Choice is seen as a real economic boon for the area.

"We've hired 98 per cent of our employees from the local area so I believe that it's been really positive for Vermillion," says Larson. "It has had a great impact on them as a city and I would think that if you asked anyone, they would say that they are appreciative of the fact that our business is in Vermillion."

Unlike many transplanted businesses that come into the area to have better access to the Bakken, Builders Choice does



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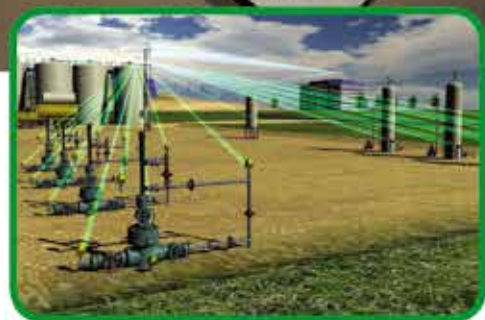
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not see its place in Vermillion as being transient. The company intends to call the city its home for a long time to come.

"The Bakken is the reason that we are here in Vermillion," says Larson. "However, we are finding that there are so many more opportunities out there than what we are currently doing in the Bakken. We are looking at school infrastructures, some airport infrastructures and medical facilities. There are a lot of things that you can build from modules that have a lot of great value in the region. So we just don't see what we're doing as something that we are going to walk away from; we are looking at this as a long-term venture and not just looking at the short-haul."

KEY FOR KEYSTONE

Another company seeking opportunities in developing projects related to the oil industry is situated north of the border, up in Canada. Based out of Alberta, TransCanada is an energy infrastructure company with an enterprise value of about \$50B. It is primarily known as being in the business of providing transportation services to customers on an open-access basis, serving all credit-worthy clients on an equal basis depending on available pipeline capacity.

According to David Dodson, a spokesman for TransCanada, the company is currently—among other things—working on developing the Gulf Coast Project. This is to be a pipeline beginning at the major petroleum storage hub near Cushing, OK, before extending 485 miles into Texas, where it will serve refineries in the regions around Port Arthur.

Planning to be operational by the end of the year, the Gulf Coast Project was part of the initial Keystone XL development. "However, when Keystone XL's presidential permit was delayed," says Dodson, "TransCanada decided to go ahead and build the Gulf Coast Project as it had all the necessary permits and there was a demonstrated need to move crude oil from Cushing to refineries on the Gulf Coast."

The Gulf Coast Project promises to have a huge effect on the communities it passes through. TransCanada estimates the amount of direct spending into the local economies will be approximately \$2M per month and equate into thousands of jobs.

"The Gulf Coast Project will employ roughly 4,000 workers at its peak," says Dodson. "Local economies will also

benefit from additional spending by these workers on lodging, food, entertainment and the like. The benefits will be temporary but local communities will continue to benefit from the hundreds of millions in tax revenues over the 30-year life of the pipeline."

As recent headline-grabbing actions of well-known protestors such as Darryl Hannah and Robert F. Kennedy Jr. have illustrated, there is still some controversy in parts of the country over TransCanada's role in the Keystone XL development. However, this is not the case for the Gulf Coast Project, where people affected by the pipelines have a very different relationship with the energy industry.

"They understand the role energy has historically played in the region's ongoing prosperity. Many of them already have one or more pipelines on their property and, overall, the support has been overwhelming," says Dodson. "Some protestors, most of them from out of state, have hampered individual work crews for hours at a stretch. But their interference has not significantly impacted the progress of construction. We have lost far more time to rain than to protests."

As the American demand for oil continues to remain strong, TransCanada is sure of its role in helping the nation meet that need.

"We are confident the national interest dictates that the United States will increase its importation of Canadian energy as Canada ramps up production of its oil sands resource," says Dodson. "We believe there will be many excellent opportunities for additional pipelines in North America."

MILES AWAY, IN MILES CITY

Two hours west of Dickinson, and sitting just southwest of the Bakken formation, is Miles City, MT. This small city of 10,000 people is starting to feel the effects of the oil industry in the region, and is doing what it can to maximize the rewards while minimizing the negatives.

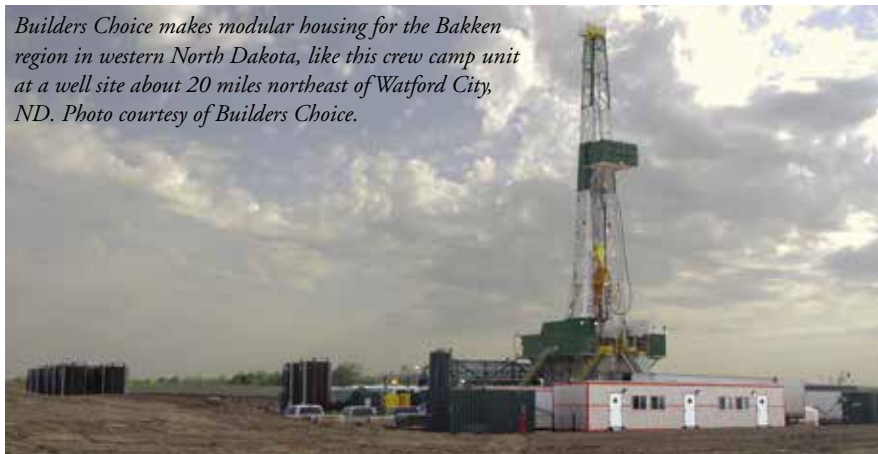
"We are definitely affected by the Bakken to some extent," says Dianna Broadie, city planner for Miles City, "we are trying to plan for it the best we can. Right now, what we don't know is exactly how far the oil exploration will go. We don't have this crystal ball that tells us the effects of the Bakken in the future."

Aside from some minor exploration in the area—mostly in the rehabilitation of older wells—Miles City finds itself in the position of being a service hub for the

*Keystone Oil Pipeline Construction in North Dakota.
Photo courtesy of TransCanada.*



Builders Choice makes modular housing for the Bakken region in western North Dakota, like this crew camp unit at a well site about 20 miles northeast of Watford City, ND. Photo courtesy of Builders Choice.



Bakken oil industry. Relatively lower land prices and having established retail services makes Miles City an attractive destination for companies looking to locate into the area.

“We have had two oil service companies come into Miles City, both involved in producing the materials for the fracking process,” says Broadie. “Our average wages here were pretty low and these companies that are locating here are bringing in higher paying jobs.”

Where the town is currently feeling the benefits of development, is in the influx of people from outside the area now coming

into Miles City. This has put a positive strain on the community’s service and hospitality industry.

“In our hotel industry in the summer, rooms were frequently at zero vacancy,” says Broadie. “And if you go into the Walmart parking lot at any given time, you will see plates from North Dakota, Wyoming and the northern part of Montana.”

Like many towns facing the progress brought on by the Bakken, Miles City is facing issues around adequate housing. Decades of stagnant population growth have resulted in a lack of new housing available to meet the current demand.

“Housing is becoming an issue,” says Broadie. “It is a very tight housing market right now, both in rentals and in purchasing. So we are trying to encourage new housing when and where we can. We can’t force private development to happen but we are talking to developers and trying to work with them.”

As the Bakken investment continues to trickle in, the one thing that is not expected to change for Miles City is in the welcoming Montana attitude of its people.

“The personality of the town has stayed the same,” says Broadie. “Miles City is always very friendly and the people will say ‘Hi!’ in the morning, whether we know you or not. And that will always remain the same no matter what.”

BAKKEN BUCKS BEYOND THE BORDER

It’s easy to see that the oil and gas boom has had a huge impact on cities and towns in North Dakota. As the growth continues, cities in other states bordering the area are seeing expansion from the Bakken business, and it looks like as long as the oil and gas are flowing, Bakken dollars will continue to flow beyond North Dakota’s borders.



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TRIVIA TIME

STUDY LOOKS AT SCHOOL ENROLLMENT IN ND'S OIL PATCH

Enrollment at K-12 schools in North Dakota's oil patch could increase by hundreds or thousands of students over the next five years, according to a new study from North Dakota State University.

The study, which was commissioned by the North Dakota Association of Oil & Gas Producing Counties, used three different models to gauge what enrollment numbers would be for the 2017-2018 school year.

"The reason why there wasn't a single model chosen as the definitive answer is because there's not a lot of good data out there," says co-author Dean Bangsund, a research scientist at the NDSU agribusiness and applied economics department. "We tried to use the models in a way that would provide some context to what we know has happened in the oil patch."

The first model showed that Dickinson's enrollment would increase by 500 in K-12, while Watford City would see 1,100 new students.

The second—and most conservative—estimate based public school enrollment on permanent employment trends. This model put enrollment in Dickinson at 3,391 and 1,167 in Watford City.

"We know there's a lot employment out in the region right now that falls into the category that we call 'temporary,'" says Nancy Hodur, study lead and research assistant professor in the NDSU agribusiness and applied economics department. "That is, folks that are just here for a short period of time—maybe a few months to a few years—or they're people that are here that work in North Dakota but don't live in North Dakota."

The final model is based on housing potential and shows that Dickinson could see as many as 5,262 students in the district by 2017—an 87 per cent increase over this year's enrollment.

NORTH DAKOTA SENATE DEFEATS WELL SETBACK RULE

By Dante Tomassoni

The North Dakota State Senate bill proposing that all oil and gas well setbacks be extended from 500 feet to 750 feet for single-well pads and to 1,000 feet for pads with multiple wells was defeated February 6, 2013 by a decisive vote of 30-17.

Sen. Stan Lyson (R-Williston), chairman of the Senate's Natural Resources Committee, said a major reason for defeating the bill was that larger setbacks would impact more land. A 500-foot setback creates roughly 18 acres of unrecoverable oil and gas property,

which would rise to 72 acres with a setback of double the size. It was also noted that no other state in the United States has a setback of more than 500 feet.

The content of this article is intended to provide a general guide to the subject matter. Specialist advice should be sought about your specific circumstances. Specific questions relating to this article should be addressed directly to the author.

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Flockin' to the Bakken



The Evergreen home comes with elegant upgrades, like sliding glass doors on the nook windows to let in the fresh outside air, plus a walk-in pantry, giving the chef in the home ample storage for their favorite ingredients.

Buffalo Hills' Evergreen Home has a comfortably spacious design. All photos in this layout provided by Darick Franzen.

By Drew Kozub

The oil and gas boom in North Dakota has led to a prosperous era in the state and people from across the country are coming to the Bakken to work and live. Those who are in it for the long haul are looking for a home to put down their roots, not just take off their boots, and a new development has been created which caters to the needs of the men and women working in the oil and gas industry in North Dakota.



The Evergreen home has a three-bedroom layout of nearly 1,500 square feet, giving the family lots of personal space when they need it, while offering open space in family areas like the kitchen and living room.

Those who are in it for the long haul are looking for a home to put down their roots, not just take off their boots...

Construction began on the Buffalo Hills subdivision in June of 2012, and little more than a year later, it celebrated its grand opening. Capturing the sprawling open spaces of the North Dakota landscape, Buffalo Hills boasts 77 one-acre lots with additional plans for growth in the near future. This spacious design gives the entire neighborhood the comfort of country living but its proximity to Watford city provides the amenities and conveniences that new homeowners are looking for.

Darick L. Franzen, Regional Manager for Spring Capital Group—a diversified private investment and real estate

development company headquartered in Eugene, OR—believes his company has created an environment that will suit the desires of workers in the oil and gas industry looking to stay for the long haul.

“What we learned early on was that families and workers coming to North Dakota were looking for space and the simple comforts of a home,” says Franzen. “A piece of land and a floor plan that could be easily maintained; something comfortable after a hard day at work, that has room for their family! We feel we’ve provided a product line that provides nice floor-plans, flooring options, cabinet and countertops, and a nice appliance package that is reasonably priced.”

Floor plans in Buffalo Hills are laid out in 1,300 to 2,200 square-foot designs. Homes start at \$189,900 and range up to \$250,000, giving owners a lot of room for customization and luxury as desired in these three-, four- and five-bedroom homes. To add culinary flare, upgrades like a lighted pot and pan hanging rack over the kitchen island, or a smooth top, self-cleaning electric range can be added. The Deluxe Glamour Master Bath package offers a spa-like oasis to the standard

bathroom with an end wall, allowing natural light to splash in and bathe the room. French doors and oak windowsills can add a classy, traditional touch to compliment the modern home designs, and various garage options are available to ensure plenty of space for a homeowner’s truck, work area and recreation vehicles or storage.

The oil and gas rush has definitely changed the North Dakota housing market. As of this time last year, according to the United States Department of Commerce Census Bureau, the home vacancy rate in North Dakota was at one-and-a-half per cent, compared to three per cent just 10 years ago. Because Spring Capital Group has a broad base of experience from working in several industries and is a family business, they are nimble and quick to make decisions, and are flexible to react to the demands and trends of various locales, making Buffalo Hills come together quickly, while still affording the quality standards the company is known for and meeting homeowners’ demands. Creating homes that people will be happy in for the long haul is something that Franzen says is very important when designing homes for people working in the oil and gas industry.

“What we are seeing is an explosion in temporary housing but Spring Capitol Group is committed to building affordable permanent homes to accommodate workers that want to stay and bring their families to North Dakota,” says Franzen. “We believe that companies will be looking for this type of housing in order to retain long-term highly valued employees.”

To accommodate the different tastes of homeowners working in the oil and gas industry, Buffalo Hills homes have a few different styles.

THE ELM

The base model Elm is the most comfortable way to get into the Buffalo Hills development. With a layout of more than 1,300 square feet, it's perfect for a couple or small family who is looking to get settled in this neighborhood catering to workers in the oil and gas industry. With option upgrades, like brushed nickel metal faucets throughout the home, stem lights over the kitchen island, and full ceramic backsplash in the kitchen, it's a stylish home and a great investment for a first-time owner.

THE EVERGREEN

A comfortably spacious design, this three-bedroom layout of nearly 1,500 square feet will give the family lots of personal space when they need it, but still offers open space in family areas like the kitchen and living room. The base model comes with elegant upgrades, like sliding glass doors on the nook windows to let in the fresh outside air, plus a walk-in pantry, giving the chef in the home ample storage for their favorite ingredients.

THE OAKWOOD

It'll be an easy transition to move from your old home to the beautifully laid out Oakwood in Buffalo Hills. This home features several options for luxury upgrades, like the bench and shelves in the master bedroom closet, which will make it easier to get ready for your day in this 1,600 square foot home, or the dormer shake siding accent to give the exterior of your house a distinguished and classy look.

THE ARLINGTON

If you like entertaining and spending time in the kitchen, you will feel right at home in the Arlington. The self-clean range with over-range microwave make prepping and cleaning up after meals simple, and the kitchen's large island is a great gathering place for friends after a long

day at work. At almost 1,700 square feet, this layout gives ample space for singles, couples or families.

THE RIVERSIDE

After a hard day of work, this 1,800 square foot home is the perfect retreat to relax and unwind in. The master bath features a massive deck tub, which will always have piping hot water with the 50-gallon electric water heater warming you up after a long workday. With Sienna Maple cabinets in the kitchen and the option to upgrade to Sienna Maple interior doors throughout the house, this home is as stylish as it is comfortable.

THE BROOKSIDE

This home comes standard with many of the features that would be upgrades in other designs (like the kitchen's full ceramic backsplash and recessed can lights) but also gives you options to upgrade to royal features, like oak windowsills or a fieldstone fireplace with raised hearth in the great room. At 1,900 square feet, this is an excellent home for a family looking to enjoy their new home in North Dakota.

THE WILLOWOOD


This home features an open design in the most common living spaces; the family room flows into the kitchen and dining nook, so that the family can be together even when they're not in the same room, despite the large 2,280 square foot floor plan. The three bathrooms and four bedrooms are perfect to accommodate a large or growing family, and the stained hardwood moulding, raised panel oak cabinet doors and soft-close drawer guides add a classy feel of elegance throughout the home.

TURNING HOUSES INTO A NEIGHBORHOOD

To create a neighborhood that is meant to be a permanent home for an industry that attracts workers from all over the country who are used to putting in temporary stints in various locales is not an easy task. The oil and gas industry in North Dakota is a prosperous one and a long-term commitment is a good option for workers who are looking to grow with the industry and work. Franzen says his company is original in their thinking by creating a development like this one and they hope this is the start of something more.

“I think we are unique primarily because we are here doing it! There are

many projects throughout the region that are not yet off the ground. We want to duplicate this project in other parts of the Bakken,” he says. “If there is someone out there with an idea on a project, we'd like to hear from them. We have a deep history of joint venturing with external partners, and understand that the right local partner can make a great difference in the success of a project.”

People who make their living in the oil and gas industry are following the work and it's led them to North Dakota. This positions Buffalo Hills as a great option for people who are planning on settling down in the state for the long haul and looking for a permanent housing solution. As the oil and gas industry continues to grow in North Dakota, families moving to the state will have a place to do the same. 

HOUSING SHORTAGE, HOUSE DESIGNERS REACH OUT TO NORTH DAKOTA


According to a study commissioned by the South Central Dakota Regional Council, Jamestown will need 1,200 additional housing units—12 per cent more than what is currently there—by 2020.

Economists at the National Association of Home Builders (NAHB) project that 16 million homes will need to be built over the next 10 years to meet consumer demand, which, in North Dakota, is comparable to the housing boom after World War II when houses couldn't be built fast enough.

“We have seen a big increase in inquiries and plan sales from builders in North Dakota looking for affordable and builder-friendly house plans that can be constructed in three or four months to meet the demand,” says Tammy Crosby, chief operating officer of The House Designers, which is offering 10 per cent off house plan packages to residents and builders in North Dakota.

Anasazi Builders in Minot, North Dakota builds custom and affordable entry homes, and is aiming to build two-story homes of approximately 1,400 to 1,600 square feet with three bedrooms, two full baths and a two-car garage, that cost around \$250,000 to \$300,000. His company is building in Silver Springs Master Plan Community in Montgomery County, where over 2,000 lots and 630 acres are being developed into buildable subdivisions.

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Oil and Water Don't Mix,



But Then Again...

By Jennifer Ryan

The laws of science show us that under normal circumstances, water and oil refuse to mix. But in North Dakota's current oil boom, water—and more predominantly, rail—happens to be the oil industry's close partner in the mission to transport oil from the centre of the continent to all North American markets.

The BNSF Railway (formerly known as the Burlington Northern and Santa Fe Railway), one of the largest in the country, moved its first crude unit train out of the Bakken oilfields on New Year's Eve 2009. Prior to that, the company had been moving crude oil regularly, but only single carloads at a time.

That's a marked difference to 2012, when BNSF moved 100 million barrels of crude oil out of the region. Based on current production expectations, the rail line predicts the volume of crude oil they haul out of the Williston Basin will increase to 700,000 barrels per day by the end of 2013.

"We have actually been hauling crude oil for over one hundred years," says John Miller, Vice-President of Sales and Industrial Products for BNSF Railway. "But the recent surge in production, due to the introduction of hydraulic fracturing, has certainly increased those volumes."

The United States is hoping to reduce its dependence on overseas energy imports in the near future. This means the huge volume of oil produced by new fracking methods must now be shipped from North Dakota, located in the center of the continent, to all other American markets, including the east and west coasts.

"The crude that is moving out of the Bakken via rail is going to destinations throughout the United States: the east coast, the west coast—both north and south—the Gulf Coast and the Midcontinent," explains Miller.

"That is one of the true values that rail offers to producers and refiners. Our network is already in place and through connections with eastern railroads, we can reach any of these destinations and many places pipelines do not go. It is this flexibility that allows producers to capture optimal returns."

This optimism, combined with current predictions of how much recoverable oil is available in the Bakken and other fields, means the United States could feasibly see its hope for energy independence become a reality sooner than later.

CHANGING DYNAMICS

According to the North Dakota Pipeline Authority (NDPA), of all the oil being transported from the Bakken, railways are handling just over 60 per cent of it. The remainder is transported by pipeline, though some does travel by natural water systems. For example, some oil is transported to barges that take it out to New York, New Jersey and other coastal markets.

Continental Resources, a leading petroleum producer headed by Harold Hamm, who was recently voted by *Time Magazine* as one of the 100 most influential people in the world (he served as an advisor to presidential candidate Mitt Romney and his running mate Paul Ryan during their bid for presidency in 2012), aims to get more Bakken product to the east, west and Gulf coast markets in 2013.

"As the country starts building more and more infrastructure to support the increased oil production, there's going to be a whole lot of oil finding its way to the Gulf Coast," says Jeff Hume, vice-chairman of strategic initiatives for Continental Resources. "The dynamics are going to change."

Currently, Continental Resources focuses its efforts on a swath of oil-rich formations running down the centre of the United States. This area includes the Bakken oil shale play in North Dakota; the Red River shale in North Dakota, South Dakota and Montana; and Anadarko Woodford and Arkoma Woodford in Oklahoma.

Over 50 per cent of Continental's production comes from the Bakken oil fields. They estimate the Bakken could potentially

contain recoverable reserves of up to 24 billion to 45 billion barrels of oil. With a strong focus on using advanced technologies (such as hydraulic fracture stimulation and horizontal drilling) to recover as much crude oil as possible so that the United States can be independent from other energy sources, the question then remains: What is the most economic way to transport the oil to markets in the rest of the continental United States?

According to the NDPA, there are over 15,000 miles of transmission and distribution pipelines in the state. This network transports not only crude oil, but also refined products such as gasoline, diesel and jet fuel; carbon dioxide; natural gas; and well production water. However, the pipeline network's reach across North America is not yet up to scratch. With simultaneous projects under construction right now across the country from as far as Texas and Alaska, and with major projects in Canada as well, "the infrastructure is slowly building," says Hume.

"The pipelines can't reach all of the markets due to lack of size," he continues. Therefore, the most popular mode of transportation right now is the railway, with its already-established network spanning the continent. However, "the transportation method of choice will swing back to the pipelines one to two years from now," predicts Hume.

ENERGY INDEPENDENCE

This is by no means an indication that railways will cease to play an important role in the transportation of oil in the future. In

fact, a huge amount of investment is going into rail sites right now, which will pay dividends in the near future, not only for those companies, but for all Americans.

"In a few years' time, a lot of the infrastructure railways are putting in now will be paid off. Railways could then lower their costs to compete with the pipelines. There will be competition for the oil. And there's certainly going to be plenty of demand for the oil," says Hume.

The benefit for Americans will be a lowered and more stable price of oil.

"The price of foreign crude is affected by conflicts and by rulers of different countries.

If we become independent, or self-sufficient, we'll see a stable oil price," says Hume. He further explains that there is a good deal of optimism within the oil industry: advances in technology means more drilling is being done with the same number of oil rigs; the workforce is becoming more educated and efficient; and the entire industry is focusing on training and safety as a top priority.

This optimism, combined with current predictions of how much recoverable oil is available in the Bakken and other fields, means the United States could feasibly see its hope for energy independence become a reality sooner than later.

"There's a very good chance, by 2020, of being energy independent in North America," says Hume.

"The Bakken will be producing more than one-and-a-half million barrels per day within five or six years. The United States imports approximately eight million barrels per day. One-eighth of the United States' demand is currently supplied by the Bakken—and this could grow to 25 per cent."

Consider the oil being produced in the Eagle Ford Formation, the Permian Basin in Texas, and other developing oil fields, and "it could really make a difference to the American people in terms of security and investment."

RAILING IT OUT


"Railing it out is working," Hume concludes. "There are adequate rail transmission facilities and cars. The biggest challenge is adequate rail sites in the east, west and Gulf coasts to receive the oil. An additional challenge is expanded storage at the delivery sites to accommodate inevitable disruptions in the schedule."

One such site, just west of Dickinson, ND is the Bakken Oil Express (BOE) Rail Hub. This loading site, the largest in the country, is located within the Three Forks shale oil play, and is directly connected to numerous pipelines originating in the Bakken.

Already capable of loading trains with 100,000 barrels of oil per day (with a 12-hour loading time per train), the site is currently undergoing massive expansions that could see its capacity double in just a few years' time. The expansion project includes additional loops, tanks, rail loading racks and pipeline connections.

Rail terminals that build tankage on-site have the advantage of holding a reservoir of oil for when the next train arrives. "That makes it a lot more efficient," says Hume. "The bulk of sophisticated facilities are building storage adequate to fill more than one train, each at 65-70,000 barrels."

Those trains—up to 100-plus cars each—are just one part of a larger network connecting every area of the continent. Today, pipelines seem to be the most cost-effective option, so Americans should be prepared to see more development projects popping up across the country.

The pipeline is a thoroughly modern connection tool; generations ago, the railway was forging a new frontier. Before that, still, were the waterways that first made exploration possible. Now, the need to transport oil is bringing these vast and venerable networks together to work towards one common and very American goal. 

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Upping Your Downtown

By Paul Adair

Vision West ND is watching the unprecedented development in the Bakken with keen interest, seeing common trends in the towns and cities affected by the boom.

"We like to say that each community is distinct," says Deb Nelson of Vision West ND, "but their needs are all so similar that they really aren't all that unique."

This is part of the reason for Vision West ND and its activities in western North Dakota as they try to pull all of these communities together in order to put a regional plan in place. A regional plan is important as it looks at the top priorities of all communities involved, and identifies where best to help and work in concert.

Five centers in the North Dakota area that are receiving attention from Vision West ND are Dickinson, Belfield, Parshall, Watford City and Alexander.

POUNDING PARSHALL

The City of Parshall is situated on the Fort Berthold Indian Reservation and lies

within the jurisdictional boundaries of the Mandan, Hidatsa and Arikara Nation.

Like all small communities in the region, Parshall has had to deal with the increased development that was brought on by the boom. However, as Parshall sits on the far-eastern fringe of the Bakken and operates with slightly different politics, it has approached the extreme growth somewhat differently than its neighbors.

Parshall has had the opportunity to approach its future planning in a slower, more measured pace and to benefit from the experiences of the communities around them. However, this is not to say that Parshall has been idle during the boom.

"For them to begin with their zoning and planning processes, they need to have what is called a comprehensive plan," says Nelson. "They have been working on this comprehensive plan for the last few years but Parshall has yet to pull it all together into a long-term sustainability plan. This is what we are doing as Vision West ND—stepping in and helping them out with

that. And we'll all get it done; it's just taking a little bit longer."

Vision West ND has had a long and valuable partnership with the people in the areas surrounding Parshall so—in terms of planning—"taking a little bit longer" can be equated with "getting it right."

WALLOPING WATFORD AND ALEXANDER

Watford City and Alexander find themselves smack in the epicenter of the Bakken oil boom. Because of this, the communities have experienced unprecedented growth, both in terms of productivity and population.

"An annual growth rate of two to three per cent is looked at with raised eyebrows and is generally considered the maximum growth that a community can handle," says Nelson. "Watford City's growth alone has been somewhere between eight to 10 per cent every year and is expected to continue in that fashion for the next 20 years. It is amazing that the community is coping as well it is and trying as hard as it can to stay ahead of the game."

Dickinson has recognized the importance in having a vibrant downtown—not only as an economic driving force but also as being indicative of their community's civic health.



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Like all communities affected by the Bakken, Watford City and Alexander have had to address the unavoidable shortcomings in their infrastructure. “They have put in stop-lights in Watford City, which nobody in a million years thought that they would ever see,” explains Nelson, laughing. “But they were forced to; if for nothing else, than to regulate the increase in truck traffic.”

In making changes and adapting to growth, any small town runs the risk of losing its small-town identity, the personality that it has developed over the many decades since its founding. These two communities face this problem the same way they do with infrastructure issues: through long-term planning.

“My own opinion is that it’s because there is so much community pride that has been there for as long as I can remember,” says Nelson. “If they sit back and simply say, ‘We can’t deal with it,’ they will be overrun. Instead, what we are hearing is a willingness to determine how to deal with the boom.”

“It’s because they want to maintain their community that they embrace the most positive things that they can about the growth and try to reduce the negative things as much as possible.”

BOOMING BELFIELD

Belfield was a community of about 600 people before the Bakken opened up. Now its population has swelled to around 2,000. With this increase in population, so have increased the problems associated with unbridled development.

Housing is a major issue that is facing the planners of Belfield. There is currently a lack of proper housing, forcing many into temporary housing situations such as hotels or RV parks. Permanent housing costs have skyrocketed, following the basic rules of supply and demand.

“Housing costs have tripled and quadrupled,” explains Nelson. “An apartment that was five years ago renting for \$400 per month is now renting for \$1,400.”

Compounding the problems with housing, Belfield is also tackling the very serious problems in providing adequate infrastructure, sufficient childcare and effective emergency services to its growing populace. The state may hold some of the solution to what ails Belfield and communities like it.

“Right now, we are in the middle of a new legislative session that’s begun. There is a lot of lobbying that is going on to

attempt to bring more dollars into the community to help them with their infrastructure shortfalls,” continues Nelson. “Certainly, the state understands that this is an issue and I anticipate there will be a lot of extra dollars coming into these communities.”

DOWN IN DICKINSON

Dickinson, the southwest North Dakota hub, helps connect the state with the action in the Bakken. By 2035, Dickinson projects that it will almost double its population and continue to grow with the oil industry.

This growth, however, does not mean that there isn't a problem in the heart of Dickinson. Like many cities throughout North America, Dickinson's downtown is in need of some CPR and TLC.

“As the Walmart and the malls moved in, Dickinson's downtown started to become more and more depressed,” says Nelson. “The downtown hasn't died by any means; it just isn't as exciting and there isn't as much traffic anymore.”

To counter this slowdown, Dickinson has sought out consultation to help shape the future of its downtown region. Doing so offers Dickinson city planners the chance to focus on some very serious infrastructure issues, handing the decisions of downtown revitalization to the experience of a consultant.

“Dickinson is a progressive little community,” says Nelson. “They have been looking at some other cities that have used consultation and have done some real downtown revitalization. People are excited about the potential of reclaiming and revitalizing Dickinson's downtown.”

While many cities have accepted the decline in their cores, Dickinson has recognized the importance in having a vibrant downtown—not only as an economic driving force but also as being indicative of their community's civic health.

“The importance of a downtown is based on community pride. When people go downtown, they want to see a clean and vibrant community that is alive and doing well,” says Nelson. “It indicates a stable community and that's important, so that the people feel committed to staying in the community.”

Having a citizenry wanting to stay in the community is key for the future plans of Dickinson, a city looking to maintain its diverse economy and manage its booming growth through 2035 and beyond. 🏠

DOWNTOWN REVITALIZATION

The Bismarck Downtowners annual statewide conference focuses on North Dakota downtown topics, including redevelopment programs, tax efficiencies, trends, planning and cohesive design. It aims to create a network of, and provide a forum for, downtown stakeholders in North Dakota and surrounding regions for downtown revitalization for community sustainability.

Downtown stakeholders are educated on the positive impacts of a healthy downtown, from economic impact and tax efficiencies

to community sustainability and affordable housing, to mixed-use planning, civic participation, a community's sense of place and historic preservation.

Revitalization programs, successful community programs and action steps in forming downtown revitalization groups and efforts are also highlighted. To learn about the next conference, go to www.downtownbismarck.com/annual-nd-downtown-conference. Details will be posted as they become available.




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An aerial rendering of the Sundance Village community development in Dickinson, ND.

Drumming Up Day Care



Patrick Hart, president of Meyer Real Estate Group.



Rick Harrison, a land planner from Golden Valley, MN and owner of Rick Harrison Site Design Studio and Neighborhood Innovations.

By Andrea Danelak

While housing shortages continue to plague many western North Dakotan communities, families with children face the additional challenge of finding available child care. In previous issues of *Basin Bits*, we highlighted the shortfall of child care facilities in the state's oil and gas producing counties, with communities struggling to fill the demand as the economy and workforce continue to grow.

The day care crunch has forced groups to use creative approaches to fill the void for child care facilities. State grants to oil patch cities have helped some areas begin to cope and increase the number of available facilities, while other counties have relied on private funders.

Bowman County, for instance, recently celebrated the opening of a new day care center that is licensed for more than double its previous capacity. A non-profit, community-owned facility, Tot Lot Child Care previously operated in a trailer house. Building the new facility—thanks to both monetary and land donations—has better equipped the center's staff to deal with the influx of children requiring day care in the area.

As we covered in the Fall 2012 issue of *Basin Bits* in an article entitled *No Kidding*,

some North Dakotan businesses have taken other unique approaches to help ease the shortage, including incorporating day care into their office buildings or offering child care services outside of normal business hours. But businesses aren't the only organizations thinking outside the box—new housing developments are also being constructed with the day care shortage in mind.

Rick Harrison, a land planner from Golden Valley, MN, recently worked on a small, city-owned development that included day care as part of the property, located right across from an elementary school. "That was driven by the need for day care," he notes.

Harrison's company, Rick Harrison Site Design Studio and Neighborhood Innovations, has helped work other solutions into housing developments in western North Dakota—namely, community facilities that can be used as day care space. "Most of these developments have some kind of community facility," says Harrison. "It really depends on the size of the development."

Meyer Real Estate Group, a full-service land development, sales and leasing, and property management company based out of Dickinson, ND, worked with Harrison on such developments.

"We've definitely given consideration to community centers within our developments,

where the child care services can be provided as part of a community service,” says Patrick Hart, president of Meyer Real Estate Group, which focuses its work on the growing community of western North Dakota and specifically the Dickinson area.

These facilities provide a common gathering space for a community, where residents can hold birthday parties, wedding receptions and other community events, as well as use it as a day care center. Manned and operated by third parties, the facilities focus on providing services to those living in the development, which is especially important for local residents who require child care services.

“The challenges are finding a quality operator that can staff the facility and trying to gain city, council and state support to help offset some of the costs associated with running one of these facilities,” says Hart.

Also on the horizon, according to Harrison, is the development of central community “cyber” centers. “They’re not day care centers per se, but the theory is that every home could be wired to these central facilities; their primary use is for the whole community. As developments get larger, the facilities could be used for day care purposes,” he says.

Both Harrison’s and Hart’s companies focus on sustainability when developing these communities, which has been proven beneficial as the population continues to grow every year and is showing no signs of slowing down.

“We’ve made a major commitment to following through with that vision (of sustainability),” says Hart, whose company is currently working on single-family, villa/townhome and multi-family developments. “We’ve taken great care to work with a quality master plan designer, and we’ve also worked closely with the city and their engineers, as well as city council and planners. There has been a very strong collaborative effort in drafting and implementing quality design and construction criteria.”

Combining his innovative thinking with that focus on sustainability, Harrison ensures that the developments he designs support a sense of community. “I just take a look at the development and say, ‘Why are we doing this? Why does that make sense? What can we do better?’” he says of his process. “The whole land development industry has been stagnant in design innovation all of these years; there is way too much replication. Houses, for the most part, don’t come down an assembly line. We don’t need cookie-cutter-looking homes. We need something special at every income level—that’s what we’re looking for.”

More specifically, Harrison focuses on designing sustainable quality of place for residents rather than simply houses to sleep in. “Looking at our designs, you will notice that none of them have straight streets like a cookie-cutter (neighborhood),” he says. “We discovered that by going with a more organic pattern, we could reduce the infrastructure required to

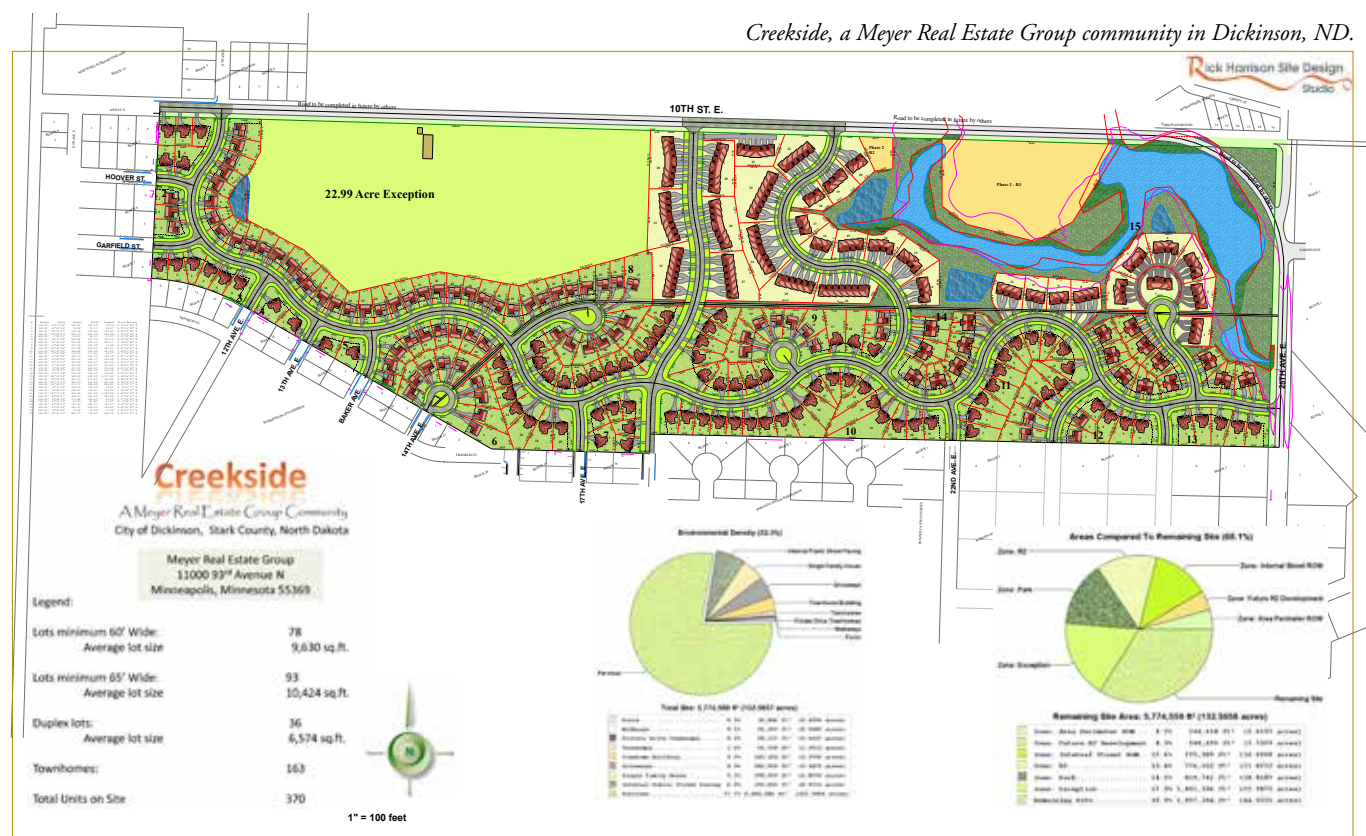
develop land by about 25 per cent. When developers come to us, the consumer is getting a much more attractive place to live.

“They have much more space, they’re safer and they have more pride in what their own,” he continues. “And when they look out the window, they actually have something to look at—they don’t have to walk five or 10 minutes down the street to a park. It’s just a better quality of life.”

Similarly, pedestrian trails are also an integral part of Harrison’s designs, adding privacy and views of nature to the communities. “A trail is an integral part to every neighborhood. The way we design our neighborhoods, everyone has a dedicated trail system, even though there are no cities that require trails (in their housing developments),” he says. “Having a central trail going through all of the developments means (future) day cares could naturally be well-located on it. We design neighborhoods around the walk, not as an afterthought.”

Harrison, who has designed the site plans for hundreds of housing developments across the country, drafts his designs using a cutting-edge technology solution that his company developed years ago. “Everything was done manually before the computer age,” he says. “But even with the advent of technology, we saw that nothing had changed on the development side—it was the same zoning and the same style as the 1950s, when most of the modern techniques were created. We figured there has

Creekside, a Meyer Real Estate Group community in Dickinson, ND.





An aerial rendering of the Creekside community development in Dickinson, ND.



Sundance Village, a Meyer Real Estate Group community in Dickinson, ND.

to be a better way of doing something with all of this technology.”

He notes that the rapid pace of development in western North Dakota offers an opportunity to ensure that all of the homes and buildings are built correctly, in order to avoid the need for redevelopment down the road, something he says happens all too often. “Unfortunately, we’ve seen cities that haven’t had control of the quality of what was being built,” he says. “You don’t want a new project that you’re redeveloping 10 years later. A land development will affect the living standards and quality of life for quite a few people for perhaps centuries.”

Indeed, Hart sees quality, sustainable developments as an incentive for people to remain in the western North Dakota area even when they are no longer working in the oil and gas industries. “I see people actually coming here and staying for the long-term,” he says. “I see them being able to afford a house and being able to become part of the community.”

As for the present, Hart outlines one of the primary advantages to ensuring communities have sufficient child care facilities and housing during the boom: family members of those working in the industry can join them in North Dakota.

“It feels like we’re setting a trend to really bring children and parents to join the rest of their families in the western North Dakota region. Without bringing everyone together to regain some sort of normalcy, the family unit itself could suffer,” he says. “Employers could also suffer attrition in their skilled labor force for those who can’t deal with the fact that they’re away from their families.”

Addressing issues like the present day care shortage can lead to more vibrant North Dakotan communities in the future, says Hart. “Our real estate group is really committed to the long-term and we know that it’s very important to stay focused, to contribute back to the community and to share our vision with others.”

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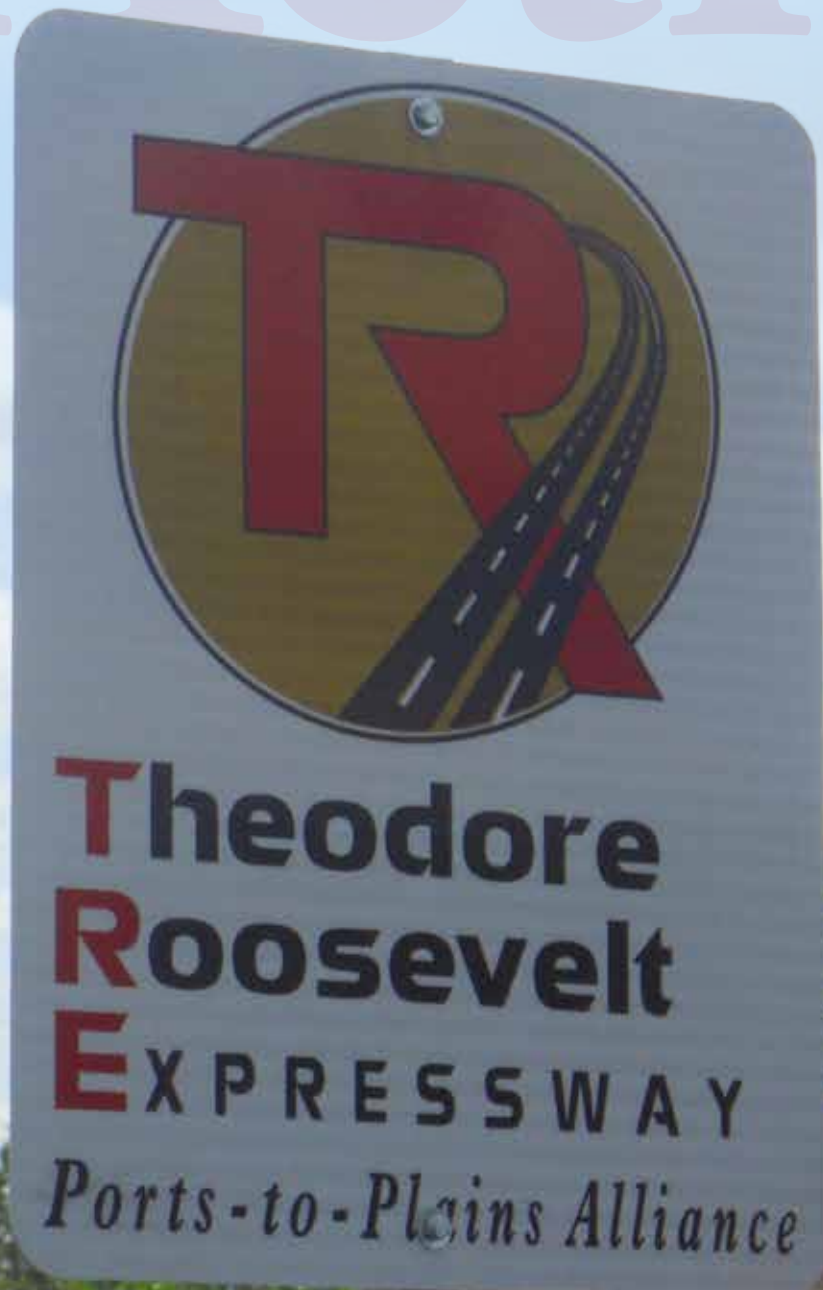
Plenty of Action

By Jim Taylor

On April 4, 1961, the Amerada Corp. struck oil on Clarence Iverson's farm in Williams County. At the time, nobody could have known that it would be start of an incredible boom 61 years later. Today, thanks to modern extraction techniques, the Williston Basin—which stretches across North Dakota, South Dakota, Montana and into South Western Saskatchewan—has surpassed Alaska as the second-largest oil producer in the United States. There is plenty of action in the Bakken oil play and it doesn't show any sign of stopping soon.

A 2008 United States geographical survey of the region reports that up to 4.3 billion barrels of oil could be extracted from the area, calling the deposit the largest accumulation of oil it has ever appraised. With this increase in prosperity, however, also comes an increase

The Ports to Plains Alliance is made up of elected officials, government workers, business leaders and citizens dedicated to creating a robust traffic infrastructure system in North America's energy and agricultural heartland. Photo provided by Brad Bekkedabl.



The improvements are just a part of what is hoped to be a much larger system that would include oil road corridors, pipelines for fluid movements and truck route bypasses that would allow rigs to travel around cities...

in activity. Over 350 oil companies call Williston County home, and the area boasts 187 wells that are either completed or under construction. Each well requires around 1,000 deliveries of water, sand, fuel and equipment. Once each delivery is made, the big rig that transported it must then travel back to where it came from. This adds up to a whopping 2,024 total trips per well—over four million trips total—according to a 2011 report.

With all of these trucks on the road, the area is in desperate need of a safe and efficient road system. Before the Bakken

boom, the region's two-lane highways could handle traffic volume with little difficulty. Today, those same roads are packed with 18-wheelers piloted by drivers on a deadline, trying to deliver their payload to the many wells that dot the landscape.

In 2011, on North Dakota roads alone, there were 162 traffic violations, 5,022 traffic injuries and 148 fatalities, according to North Dakota Department of Transportation (NDDOT) statistics. Accidents can happen in the best of conditions, but the sudden influx of trucks on the region's roads leave very little

room for mistakes. The increased volume also adds significant travel time to every vehicle on the road and adds significant wear and tear to road surfaces. The NDDOT is responding to this need by providing an unprecedented amount of funding in its upcoming budget for major roadway construction and repair projects at the city, state and county level.

One route that is of particular concern is U.S. Highway 85, which runs directly through the Bakken oil play and into the oil sands of Canada. The route also takes on traffic that is filtered off Interstate 94 and Highway 200, making it an incredibly busy thoroughfare. According to a 2012 NDDOT report, traffic volume on Highway 85 has increased by 124 per cent in the past year. The NDDOT has made this highway a priority, dedicating efforts to expanding Highway 85 to four lanes, with an additional eight feet of shoulder space for each side, for 25 miles between Williston, ND and Watford City, ND.

For Williston City Commissioner, Dr. Brad Bekkedahl, these improvements couldn't have come at a better time. Bekkedahl, an outspoken advocate for improvements to Highway 85, is a member and secretary for the Ports to Plains Alliance, a collection of elected officials, government workers, business leaders and citizens who are dedicated to creating a robust traffic infrastructure system in North America's energy and agricultural heartland. Bekkedahl considers the northern third of the Ports to Plains Alliance system—known as the Theodore Roosevelt Expressway—a vital link that will improve the quality of life and travel for the entire region.

"Since the very beginning, the Theodore Roosevelt Expressway Association has been working with us to improve the development, safety and efficiency of our transportation systems in North Dakota," says Bekkedahl. "This improved corridor will be a wonderful addition to our current system that has seen a marked increase in oil, tourism and production in recent years."

The proposed changes to Highway 85 will take a number of years to complete but advocates are already lauding them as



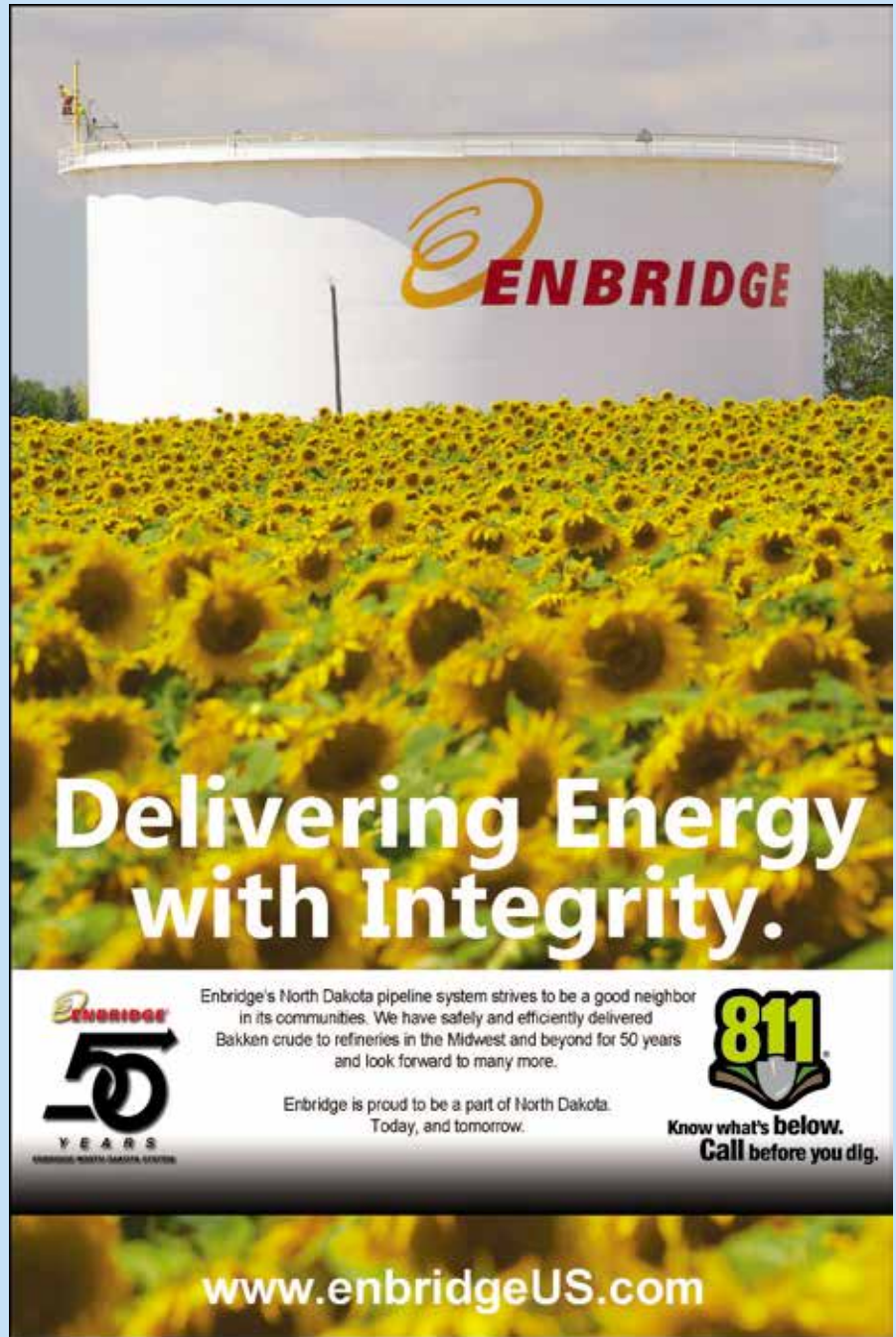
a significant step towards a streamlined transportation corridor that will reduce traffic accidents by as much as 50 per cent, increase the freight flow of both the energy and agricultural industries, and promote economic development in a region that—until the Bakken boom—was seeing a loss in population to more urbanized centers in the United States.

The improvements are just a part of what is hoped to be a much larger system that would include oil road corridors, pipelines for fluid movements and truck route bypasses that would allow rigs to travel around cities, rather than through them. The new synergy that is hoped to result from these improvements will also have a positive trickle-down effect on other areas of the region's economy.

Since the boom, employment numbers in cities like Williston, ND have seen significant growth in almost every area. With an efficient transportation system in place, employment in all industries could see a growth of around five per cent per year, from 2017 through to 2026. Williston's hospitality industry is experiencing a boom of its own, seeing a doubling in the number of hotels since 2009. With the oil industry growing at its current rate, and with the proper traffic facilities in place, this number could double again in just a few short years.

When it comes to oil, business is booming in the Williston Basin. But, like the roughnecks and drillers who maintain its wells, the basin needs the right tools for the job to be done properly. While the region's current growth spurt may cause a few short-term pains, advocates like Bekkedahl feel that a bright future is on the horizon, and that a safe and efficient traffic system is a major part of the process.

"This is a corridor of national significance," he says. "It's important that we continue our hard work to ensure it receives the development it needs."



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Staggering One-Year Success: A Vision West Progress Update



Ashley Alderson and Rep. Kempenich (Dist. 39) at the Childcare booth at the Vision West ND Legislative Summit on January 28, 2013 at the North Dakota State Capitol.



Brady Pelton (North Dakota Association of Oil & Gas Producing Counties), right, and Senator Oley Larsen (Dist. 3), left, at the Vision West ND Legislative Summit.

Vision West ND engages nearly 1,000 people

By Andrea Boe

“**N**ever underestimate the power of a small group of committed people to change the world. In fact, it is the only thing that ever has,” states a famous quote by cultural anthropologist Margaret Mead. The dedicated people of Vision West ND may not change the world on a grand scale, but they are paving the way for change in their corner of the world—western North Dakota.

The Vision West ND project began in February 2012. At the onset, all of those involved knew they were part of a very important project but no one could have predicted the exceptional collaboration that would ensue, which made giant leaps forward possible in only one year's time.

Vision West ND is comprised of 19 western North Dakota counties, Three Affiliated Tribes, four universities and colleges, two regional councils, the Rural Economic Area Partnership (REAP) Fund, the Southwest REAP Zone and the North Dakota Association of Oil & Gas Producing Counties (NDAOGPC). This consortium—along with nearly 1,000 people in the region—participated in numerous planning

meetings, from specific small group meetings to town hall meetings open to the public, to identify challenges and find solutions to meet individual community and regional needs.

“The participation of people in the region is remarkable,” says Vision West ND Consortium Chairman, and NDAOGPC President Dan Brosz. “The local population wants to be heard and, more importantly, they want to be part of the solution. We saw this time and time again as we went through the project process.”

The Vision West ND team heard the messages loud and clear. Cities need more funding for vital infrastructure such as water and wastewater systems. Their roads have taken a beating with the extensive truck traffic brought on by increased oil production in the region. Solutions for housing and day care were critical to sustain the additional population needed for employment in these cities. Existing businesses wanted support and a focus for downtowns to survive and thrive was brought to the forefront. Vision West ND collaborated with communities and tribes to work toward viable solutions to these issues.

“Leaders now have a roadmap of sorts in their hands to help guide their communities to sustainable solutions.”

OVER 50 PLANNING DOCUMENTS IN THE HANDS OF LEADERS RIGHT NOW

What came from these countless planning meetings were 21 local community Economic Development Strategic Plans. The Economic Development Strategic Plans took into account the specific issues affecting the particular community participating. Community development strategies were carefully evaluated and the ones that were most feasible according to the community traits rose to the top.

“Leaders now have a roadmap of sorts in their hands to help guide their communities to sustainable solutions,” says Brian Cole of Building Communities, the project team partner that led the development of the Economic Development Strategic Plans. “In addition, we are here to support those leaders to execute the solutions identified. We are not just handing over a plan and leaving; we understand that carrying out the strategies is the most important part.”

Community Development Strategies	Times Selected*
Infrastructure Development	19
Business Retention & Expansion	18
Attracting Government Funding	16
Local/Regional Tourism	15
Downtown Development	13
Business Recruitment	12
Pass-Through Visitor Services	12
Energy Development	12
Entrepreneurial Development	11
Value-Added Agriculture	11

**Out of 19 completed plans to date.*

Additionally, 26 Municipal Infrastructure Assessment reports were completed over the past year. Infrastructure was one of the top priorities for participants in the region, and the assessments were vital to understanding the current and near-term situation faced by cities affected by the boom in oil production. The Municipal Infrastructure Assessments included an inventory of water, wastewater,

stormwater and street infrastructure, identified immediate needs, and provided prioritized improvements and associated costs.

“I visited each of the participating communities in person to understand the situation and to ensure I captured all of the data possible. Most of the participants were very small communities that have not had any infrastructure planning or improvements in many, many years. They were excited to have access to the service Vision West ND was providing,” says Loren Hoffmann of AE₂S, the project partner that completed the assessments.

“What is so great about this project, is the fact that these reports are not only in the hands of leaders, they are accessible to everyone,” says Jasper Schneider, North Dakota’s State Director for United States Department of Agriculture’s Rural Development. “Impactful planning starts at the local level. This project engages the community at the grassroots level and then creates many succinct plans that culminate into a larger regional plan that everyone can hang their hat on.” Vision West ND shares all of the completed plans in their entirety on its website at www.VisionWestND.com.

VISION WEST ND SHARES PROGRESS WITH LEGISLATORS

Vision West ND held a Legislative Summit that showcased the project progress and milestones reached thus far and the goals for 2013. The event was held on January 28, 2013 at the Legislative Hall in the State Capitol Building. The summit included 10 stations, manned by project team members, which educated legislators and answered questions about the components of the project. Vicky Steiner, who pulls double duty as both the Executive Director of NDAOGPC and a State Representative, said the event was crucial in connecting the dots between the needs of local citizens and the thought process behind legislative initiatives this session.

continued on page 70

PROJECT GOALS AND MILESTONES

Completed in 2012:

- Twenty-one Economic Development Strategic Plans;
- Twenty-six Infrastructure Assessments;
- Two planning and zoning workshops; and
- Seven new webinars on managing growth.

Planned for 2013:

- Twenty project schematics; and
- One Regional Plan.

continued from page 69

ADDED-VALUE SERVICES ENHANCE THE PROJECT

Beside the Economic Development Strategic Plans and Municipal Infrastructure Plans being completed, Vision West ND also provided two Planning and Zoning workshops and seven webinars on managing growth, and initiated a series of planning meetings and a statewide child care summit. These were direct results of the needs identified in the earlier strategic planning sessions. Small communities that were previously in a state of population decline are now seeing tremendous growth due to increased oil production in the past four years. Many areas were unprepared to handle the issues that come with unprecedented growth.


"Planning and zoning is crucial to managing logical and strategic growth. It is the basis of community planning," says Vision West ND project partner Cindy Gray of SRF Consulting.

Vision West ND participants were able to benefit from these workshops and the planning and zoning best practices workbook, which was shared with those in attendance and also can be found on the Vision West ND website.

Another key value-added service being provided to participants is professional architectural schematic drawings. Project partner ICON Architects is providing 20 project schematics to communities that participated in the strategic planning portion of the project. If one of the community's strategic initiatives involved a facility/building, a schematic drawing of the initiative will be provided to the community free of charge.

THE NEXT PHASE: PUTTING THE PIECES TOGETHER TO FORM A REGIONAL PLAN

As you may recall, the Vision West ND project, which is made possible through grants from the United States Department of Housing and Urban Development and the North Dakota Departments of Trust Lands and Commerce, is also meant to be a combined Regional Plan for Sustainability. The next phase of the project is utilizing what was learned and developed on a local level and combining it, with additional input, into a Regional Plan that can be adopted across western North Dakota.

"The project team has started tackling this enormous task and has a solid project approach to deliver the Regional Plan by the end of 2013," says Shirley Brentrup, Vision West ND Program Director. As the plan is developed, community leaders will continue to be engaged and critical milestones and progress will be shared with participants in an effort to create a pragmatic and useful Regional Plan; a Regional Plan that may help deliver change to this little corner of the world. 

WHO IS VISION WEST ND?

The Vision West ND consortium is made up of the following groups:

- 19 Western North Dakota counties;
- Three Affiliated Tribes;
- Four universities and colleges;
- Two regional councils;
- Rural Economic Area Partnership Fund;
- SW REAP Zone; and
- The North Dakota Association of Oil & Gas Producing Counties.



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Proposed Changes to the Uniform Truck Permit System



By Janet Sanford, ND Uniform County Permit Program

A North Dakota Association of Oil and Gas Producing Counties Uniform Truck Permit System Sub-Committee meeting was held in Watford City on December 10, 2012. The committee was made up of a group of county sheriffs, county road superintendents, county engineers and county commissioners from participating member counties.

The group reviewed the current Heavy Weight Fee Schedule (which can be found within this article) and discussed possible changes that may be needed to the fee schedule.

After much discussion, the consensus of the group was to focus on the heavier loads because they are doing the most damage to the county roads. The counties would like notification before large loads travel on the county roads, in order to give them a chance to make changes to the route or deny the trip if the route involves compromised road conditions. The safety of the travelers and the ongoing road maintenance are of great concern to county officials.

The changes to be proposed to the association are as follows:

- Currently, the fee schedule is based on a graduated rate ranging from \$20 to \$210 depending on the load type and the gross vehicle weight (GVW) of the load. A permit is required on any load 105,500 lbs. or heavier. For loads over 200,000 lbs. GVW, a \$5 per ton per mile fee is

THE NDAOGPC'S UNIFORM COUNTY PERMIT HEAVY WEIGHT FEE SCHEDULE: TRUCKS & TRAILERS

Gross Weight	Extra Cost for Trucks & Trailers
Under 105,500 but over-width or over-length	\$20
105,501 - 110,000 lbs.	\$30
110,001 - 115,000 lbs.	\$40
115,001 - 120,000 lbs.	\$50
120,001 - 125,000 lbs.	\$60
125,001 - 130,000 lbs.	\$70
130,001 - 135,000 lbs.	\$80
135,001 - 140,000 lbs.	\$90
140,001 - 145,000 lbs.	\$100
145,001 - 150,000 lbs.	\$110
150,001 - 155,000 lbs.	\$120
155,001 - 160,000 lbs.	\$130
160,001 - 165,000 lbs.	\$140
165,001 - 170,000 lbs.	\$150
170,001 - 175,000 lbs.	\$160
175,001 - 180,000 lbs.	\$170
180,001 - 185,000 lbs.	\$180
185,001 - 190,000 lbs.	\$190
190,001 - 195,000 lbs.	\$200
195,001 - 200,000 lbs.	\$210
Over 200,000 lbs.	\$5/ton/mile

Heavy Weight fees do not apply to loads over 200,000 lbs. On loads over 200,000 lbs, the fee is \$5/ton/mile on all weight over 105,500 lbs.

Example:

300,000 lbs. gross vehicle weight - 105,500 = 194,500
 $194,500 \div 2,000 = 97.25$ tons
 $97.25 \text{ Tons} \times \$5.00 = \$486.25/\text{mile}$

Uniform Permits are NOT authority to use county roads during weight restrictions (Frost Law). Contact the Sheriff Department or County Road Superintendent in each county before using any County Road during the Frost Law period.

imposed. Currently, either an e-permit or a self-issuing permit is available for heavy weight trips on county roads.

- Due to the vast increase in the numbers of large loads traveling on the county roads in western North Dakota, the consensus of the committee was to propose some changes to the current Heavy Weight Fee Schedule and procedures. One proposed change is to modify the fee schedule, lowering the gross vehicle weight point at which the ton per mile fee commences. The committee will propose that the \$5 ton per mile fee commence at 150,000 lbs. GVW, rather than the current 200,000 lbs.

- In addition, the counties would like prior notification that these loads over 150,000 lbs. will take place, so that county officials have a chance to review the load and route, and to make routing changes or to deny the trip if necessary. If this notification period is implemented, the process may require a three-day waiting period, similar to the Rig Move Permit procedure currently in place. In addition, the committee will propose that the self-issuing permits be valid on trips of 150,000 lbs. and below only. Loads over 150,000 lbs. will require an e-permit so that the notification procedure can be put into place. The full NDAOGPC Truck Permit

Advisory Committee will be meeting in April, at which time the committee will consider the proposed changes brought forward by the sub-committee and decide whether the proposed changes should be submitted to the NDAOGPC Executive Committee for its consideration.

The NDAOGPC counties participating in the Heavy Weight Truck Permit System include Adams, Billings, Bottineau, Bowman, Burke, Divide, Dunn, Golden Valley, Hettinger, McKenzie, McLean, Mountrail, Renville, Slope, Stark, Ward and Williams.

For more information, you can visit the NDAOGPC website at www.ndenergy.org.

THE NDAOGPC'S UNIFORM COUNTY PERMIT HEAVY WEIGHT FEE SCHEDULE: WORKOVER RIGS & CRANES

Gross Weight	Extra Cost for Workover Rigs & Cranes
40,000 - 60,000 lbs.	\$30
60,001 - 100,000 lbs.	\$40
100,001 - 110,000 lbs.	\$60
110,001 - 115,000 lbs.	\$70
115,001 - 120,000 lbs.	\$80
120,001 - 125,000 lbs.	\$90
125,000 - 130,000 lbs.	\$100
130,001 - 135,000 lbs.	\$110
135,001 - 140,000 lbs.	\$120
140,001 - 145,000 lbs.	\$130
145,001 - 150,000 lbs.	\$140
150,001 - 155,000 lbs.	\$150
155,001 - 160,000 lbs.	\$160
160,001 - 165,000 lbs.	\$170
165,001 - 170,000 lbs.	\$180
Over 170,001 lbs.	\$190

THE NDAOGPC'S UNIFORM COUNTY PERMIT HEAVY WEIGHT FEE SCHEDULE: EARTH MOVING EQUIPMENT

Gross Weight	Extra Cost for Earth Moving Equipment
40,000 - 70,000 lbs.	\$30
Over 70,001 lbs.	\$50

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- Wait for fracing (+/- 90 days): first (and additional) well on pad = 0 trips.
- Fracing (15 days): first well on pad = 834 trips, additional well on pad = 584 trips.
- Production equipment move and pit reclamation (20 days): first well on pad = 55 trips, additional well on pad = 55 trips.
- Well development total: first well on pad = 1,252 truck trips per well, additional well on pad = 837 truck trips per additional well.

Source: "Bust to Boom: Planning in Western North Dakota" by SRF Consulting Group, Inc., Truckload Timelines and Lynn Helms, NDDMR, July 2012

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Cartoonist Kevin Holten, holten24@gmail.com



TRIVIA TIME

MOTOR VEHICLE FATALITIES AMONG OIL AND GAS WORKERS

- Motor vehicle crashes are the leading cause of work-related deaths in the United States and in the oil and gas industry, according to a recent study by the Centers for Disease Control and Prevention's National Institute for Occupational Safety and Health.
- Between 2003 and 2009, 202 workers employed in the oil and gas industry were killed in work-related vehicle

accidents, accounting for 28 per cent of all oil and gas work-related deaths during that time.

- Texas, Oklahoma, Wyoming, New Mexico and Kansas had the highest rates of motor vehicle fatalities associated with the oil and gas industry, however the current exploration boom in the Bakken highlights the need to address driver safety issues.
- Frequent travel between well sites, travel on rural roads which often lack firm shoulders and rumble strips, low level of seat belt use and long and irregular work hours put workers at risk for fatal motor vehicle crashes. Only death rates associated with motor vehicle accidents in the transportation and warehousing industry was greater than in the oil and gas industry.
- Over half of the oil and gas worker fatalities involved one vehicle that had jackknifed, overturned, or struck an object in the road. Pickup trucks were frequently involved in collisions with oncoming traffic, and for semi-trucks, jackknifing or overturning was most common.

- Over 60 per cent of oil and gas workers killed in motor vehicle accidents were employed by well servicing companies. More than one quarter of all workers who died were employed by well-servicing companies that had fewer than 20 employees. Workers from well servicing and drilling contractors were more likely to die in a vehicle crash compared with oil and gas operator employees.
- Half of the oil and gas workers killed in motor vehicle accidents were not wearing a seatbelt or ejected from the vehicle and presumably not belted in. While correct usage of lap and shoulder belts by light truck drivers reduce the risk of fatal injury by 60 per cent and moderate to severe injury by 65 per cent, the low level of belt use in the oil and gas extraction industry may be partly related to the work culture.

Source: www.rigzone.com/news/oil_gas/a/125156/Technology_Addresses_Driver_Safety_in_Oil_Gas_Industry

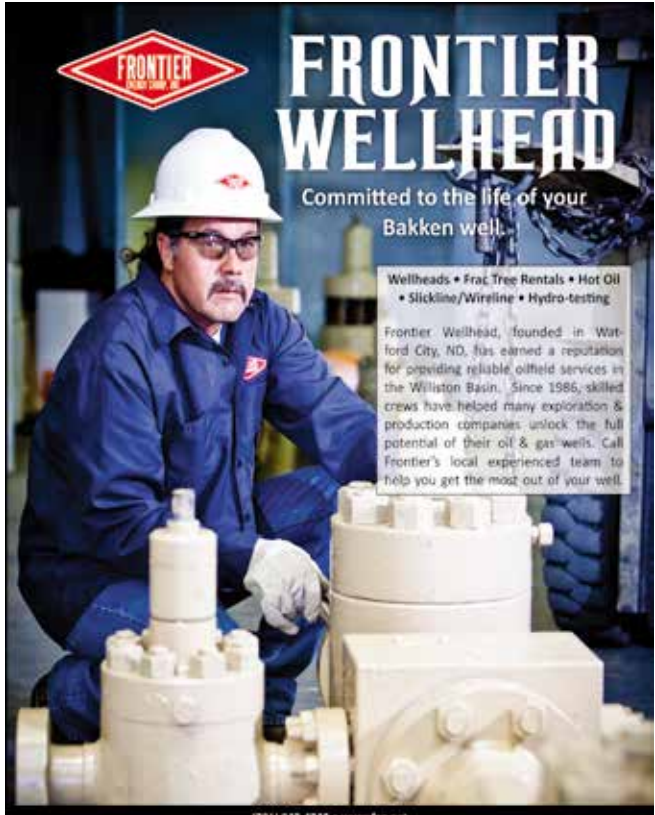


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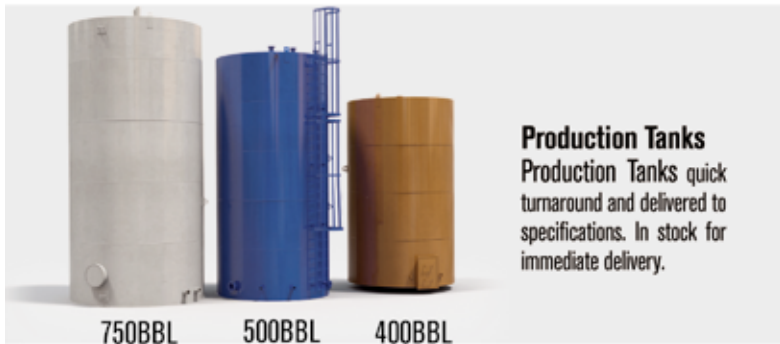
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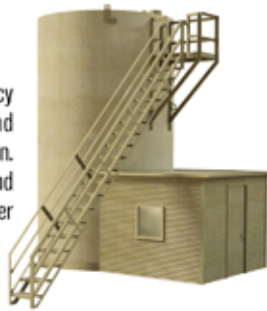


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CCD Chips being scooped off of the water after absorbing surface oil.

Cleaning Up

By Drew Kozub

CCD Chips being dispersed into a container with water and oil, simulating a spill. All photos in this layout provided by Bakken Western Service.



Saturated CCD
Chips ready for
disposal.

Their Act

Having an effective plan for cleaning up an oil spill is a little like investing in the extended warranty on your new vehicle; you probably won't ever need it because you're going to take every precaution to protect your new ride, but if something ever were to go wrong, you don't have to panic because you have a proven and planned system in place to fix the problem.

The oil and gas industry in North Dakota provides many jobs, including ones which employ some of the most talented individuals for crisis management and planning—people who have worked out important systems for managing oil spills on land and water. By creating, implementing and practicing your own oil spill plan, you can quickly and effectively deal with the unlikely—but potentially damaging—effects of a spill.

The North Dakota Petroleum Council (NDPC) represents more than 420 companies involved in all aspects of the oil and gas industry, including oil and gas production, refining, pipeline, mineral leasing, consulting, legal work and oilfield

“The proprietary process for how the chips are created actually repels water and attaches to oil, so you drop the chips into the water, they stay floating, attach to the oil, and you’ve contained the spill.”

service activities in North Dakota, South Dakota and the Rocky Mountain region. With such a large and diverse membership, NDPC Vice-President Kari Cutting says their network can effectively assess incidents where an oil spill occurs to make sure it does not get repeated.

“In the aftermath of a spill, the NDPC will bring operators and regulators together to evaluate the incident, determine factors that contributed to the spill and disseminate pertinent information back to the member companies,” says Cutting. “Evaluation of root

causes of an incident, whether they are from equipment failure or human error, significantly reduce the probability of a similar event occurring.”

It is important for companies not only to have a plan in place for oil spills but to make sure their employees know how to react if a spill happens so the cleanup effort can begin immediately. Cutting says spill response planning and training are common practice in the oil and gas industry in North Dakota, with highly qualified emergency response infrastructures in place to deal with a spill.

"Planning, and the training that accompanies planning, leads to minimizing response time in the event of an incident and shorter response time means less impact to personnel, nearby residents and the environment."

A group of oil, gas and pipeline company members of the NDPC that work near the upper Missouri River and Lake Sakakawea regions formed a limited liability company to provide rapid response resources to assist NDPC members in the case of an open water spill. The Sakakawea Area Spill Response LLC (SASR) shares and deploys existing emergency response

and spill-containment equipment, and offers companies that operate in the area the tools to expand and coordinate their cleanup capabilities in the event of a spill.

No oil spill is a simple cleanup, but water oil spills present unique challenges because they can spread and move around so quickly. Brett Gendreau and Toby Schweitzer are sales representatives for Bakken Western Services, a company producing tools to help the oil and gas industry clean up after a spill occurs.

"There is a tendency when oil hits water for it to spread quickly, so it's hard to contain," says Gendreau. "Reacting quickly is important."

Bakken Western Services has a great tool to help companies react quickly when a spill occurs. They made a presentation in Medora, ND last September about one of the company's products that can be used to clean up oil spills on water and land: CCD Chips.

"Clean, Collect, Dispose. That's where we get the name for our CCD Chips," says Schweitzer. "The proprietary process for how the chips are created actually repels water and attaches to oil, so you drop the chips into the water, they stay floating, attach to the oil, and you've contained the spill."

The CCD chips are made from a blend of hardwood and softwood chips, making them safe for the environment. They are coated in a special organic material that makes them water repellant while being able to attract and retain the oil floating on the top of the water. The distribution method for these chips is very rapid and quite spectacular.

Bakken Western Services employs the experience of Double M helicopters, which is owned by Monte Myers, a 29-year army veteran. Using a helicopter outfitted with a specially-designed transportation unit called an Eco Bucket, the chips are flown into a location and then distributed directly onto the site of the spill. The chips go to work instantly, which stops the spread of oil.

"If the chopper gets there and drops the chips on the spill, the spread of the oil is stopped," says Schweitzer. "You can get the chopper out there in a few hours and once the chips are spread, they can float a mile away and you can collect the oil chips later. They might be moving somewhere, but the oil is contained in the chips."

There are various methods used to collect the chips once they are distributed making the collection and disposal process simple. The most important thing when a spill occurs is reacting quickly to contain the oil before it spreads out of hand. Gendreau and the team at Bakken Western Services are ready to act when the time comes to clean up a spill.

"With all of the oil activity going on in the area, it's not *if* a spill is going to happen, it's *when* it's going to happen," says Gendreau. We have a plan and process in place that can be distributed in different areas around Sakakawea, and we can attack the situation right away. CCD chips are unique because you can mobilize the product, pick it up, clean it, and move it in a hurry."

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What a Waste

The background of the entire page is a dense, overlapping pattern of US dollar bills, including \$100 and \$20 bills. In the foreground, a blue and red oil pumpjack is visible, with its red counterweight and blue frame. The pumpjack is positioned on the left side, with its arm extending towards the center. The overall image conveys a message about the high cost of oil production and the waste of resources.

Oil rig: Several million dollars.

Land purchase: Several million dollars.

Employee salaries: Several million dollars.



Staff members at the landfill scan all loads that originate from the oilfields with Geiger counters to spot violators...

Soon, six oil companies had been banned from dumping. The uproar became the catalyst for action. The Williston city commissioners met and voted to increase the penalty fee by 10 times, up to \$10,000 per infraction.

The commission concluded it would be necessary to introduce a significantly steeper fee because a serious problem was being consistently ignored. Williston Landfill then waived the ban for five of the six companies, allowing them to renew contracts with a clean slate.

Yet, even with the new fee, oil companies continue to disregard the rules set in place for the proper disposal of hazardous wastes. The Williston Landfill used to see an infraction on a daily basis. The number is significantly reduced now, but the problem still continues.

"Since the increased fee, we're glad to see it's definitely changed a lot," says Brad Septka, Williston Landfill foreman. "In the last three weeks, we haven't rejected any loads for radioactivity. But we still have some companies that will hide their hazardous materials within their loads."

Septka estimates that he and his staff still find violations about once a week. The landfill cites the North Dakota State Health Department's Guideline 42 in determining which violations will be smacked with the heftier fine: "All radioactive material or contaminated loads will be rejected and documented. A \$10,000 fine will be applied to all loads dumped containing used pit liners and filter socks or contaminated loads."

Staff members at the landfill scan all loads that originate from the oilfields with Geiger counters to spot violators—some of whom purposely conceal their hazardous items within a load of other acceptable materials. Williston Landfill's managers believe that even with the bigger fee as a deterrent, some oil companies are still willing to take the risk because the cost of disposing of the hazardous material is also high.

ALTERNATIVE SOLUTIONS FOR HAZARDOUS WASTE

There are alternative solutions for disposing of waste—even the hazardous and radioactive items. Several companies even provide a certificate that shows where the waste has gone and verifies that it was disposed of properly. The cost for this service can run approximately \$8,000.

The Williston Landfill hosted an information session attended by other waste management services and landfills. The purpose was to show oil companies and haulers that there are other options open to them, including shipping the waste to licensed and government-approved, out-of-state facilities. Next Generation Solutions, a Colorado-based waste management company, attended, as did Indian Hills Disposal and Clean Harbors' Sawyer Landfill.

These companies specialize in handling filter socks, pipe scaling, tank bottoms and salt water. The used materials contain traces of radium, uranium and thorium—a natural byproduct that comes from pulling oil from the ground.

However, those elements are considered radioactive and can have ill effects on the environment and those living near it when exposed for long periods of time.

In addition to long-term effects, the hazardous materials pose a more immediate threat when in the landfill. They have already caused a number of fires at the Williston Landfill.

The fumes from the fires are hazardous, and the illegal dumps can combust unexpectedly, endangering the lives of those in the area.

Unfortunately, companies like Next Generation Solutions are not seeing as much waste as they would expect. Filter socks are used prevalently in the Bakken region, as they play a vital role in the hydraulic fracturing stimulation methods used in North Dakota. The residual saltwater from the fracing procedure is toxic, and the filter socks strain the water that comes from the oil wells.

With hundreds of oil wells in operation, the filter socks must be changed frequently. The number of filter socks being disposed of should be very high; but representatives at disposal companies like Next Generation Solutions do not see all of


By Jennifer Ryan

With the types of costs most oil companies incur as a matter of everyday business, what is another \$1,000?

That was the reasoning behind a recent fee hike from \$1,000 to \$10,000 for oil companies who bring radioactive and hazardous waste materials to Williston Landfill. Some oil company representatives have explained it wasn't that the oil companies didn't care about being in violation: simply, the \$1,000 fine was too negligible for it to even come to the attention of those with the authority to change their practices.

Williston landfill managers have been lobbying for years for stronger reinforcement of the rules but violations continued to be prevalent. In the autumn of 2012, Williston Landfill representatives sent letters to all oil companies explaining the \$1,000 fee and also announced that any violators would be banned from using the landfill.

There are alternative solutions for disposing of waste—even the hazardous and radioactive items.




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these materials. The rest, they suspect, are being hidden along with legitimate items in loads.

The risks are steep, and the fine is, too, but Williston Landfill managers say the fine was a necessary step.

“We needed the people at the oil companies to pay attention to these fines. When it was just \$1,000, they weren’t even aware of the problem,” says Septka.

DEVELOPING PROBLEMS NEED NEW SOLUTIONS

The problems associated with waste disposal are new, as the region continues to develop. Undoubtedly more regulatory restrictions will be put in place over the coming years. But for now, landfills in the Bakken region are working together to help stop violators. When Williston identifies a hazardous load through its scanning methods, they issue the \$10,000 fine and then contact other landfills in the surrounding area.

After Williston rejects a load, there is no way to track where the hauler takes it, and no way to know if he or she will attempt to dump it in another landfill.

“Now we’re definitely working together to fight this problem,” says Septka. “It’s important to all of us, so we are communicating. It’s been helpful.”



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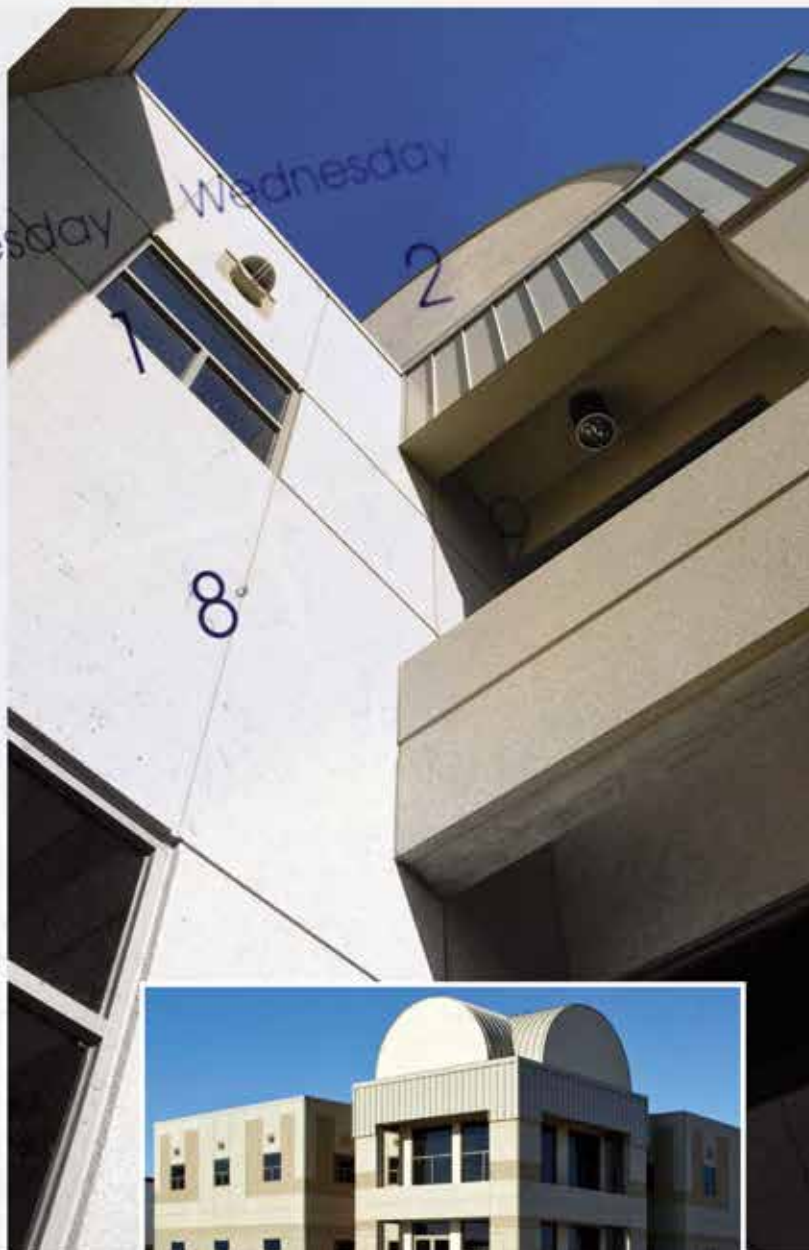
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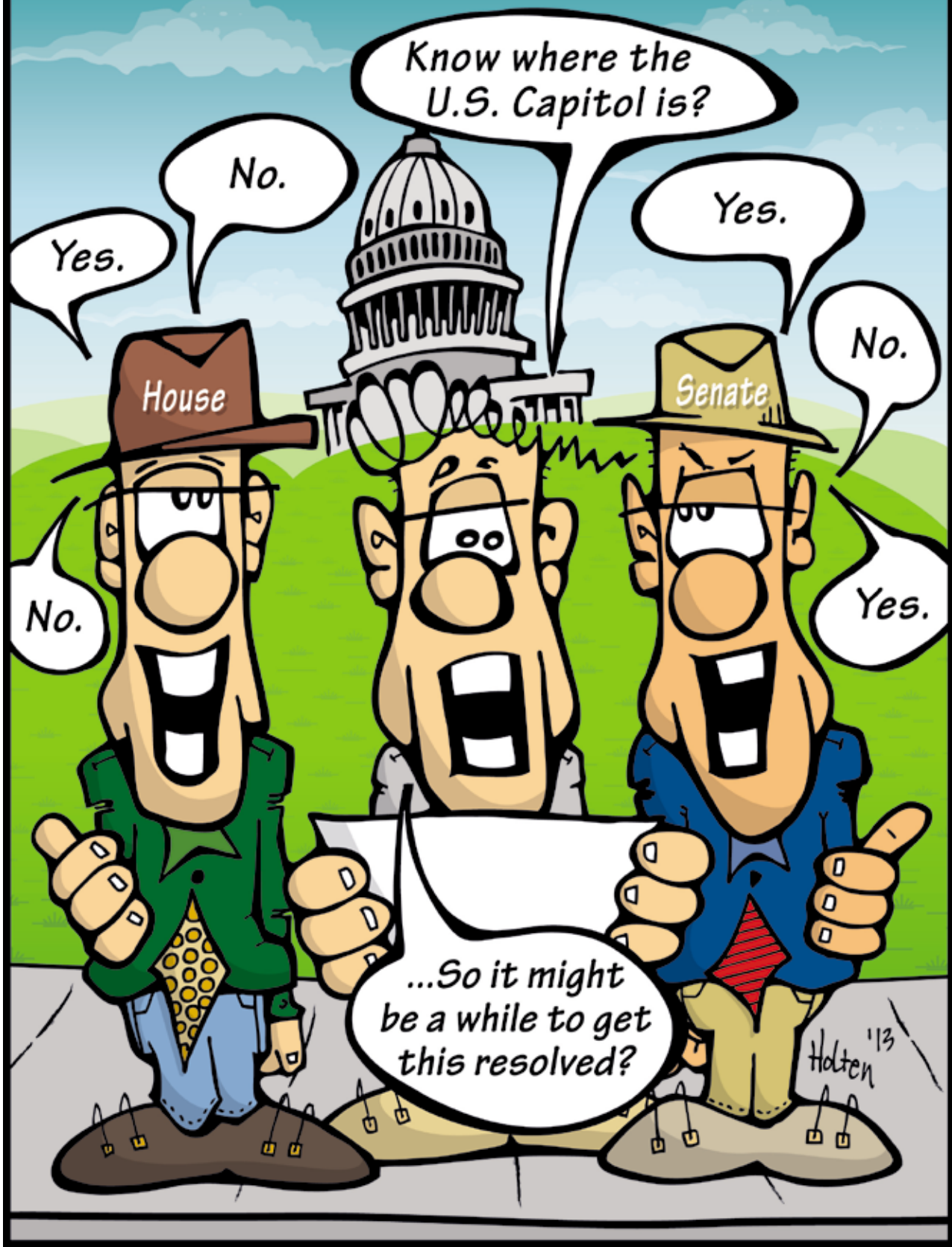
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Using North Dakota Clay for Ceramic Proppants: Will it Work?

By Paul Adair

In the world of ceramic proppants, not all clays are found to be equal. Recently, the North Dakota Geological Survey (NDGS) collected 200 clay samples from western North Dakota with the hopes of determining the samples' suitability for use as a component of the fracking process in Bakken oil exploration.

Scientists at North Dakota State University's (NDSU) Center for Nanoscale Science and Engineering (CNSE) then analyzed the clay as part of a research agreement with the NDGS.

There is a tremendous amount of proppant presently being used in the Bakken. As a component of the fracking fluid, proppant is injected into the fractured rock during the fracking process and is used to hold open the cracks to allow the oil and natural gas to flow into the borehole. When ceramics are utilized, each well uses approximately three million pounds of proppant material. With roughly 2,000 wells in the Williston Basin region, that equates to about three million tons of proppant being required annually.

A substantial percentage of the ceramic proppant used in the Bakken is currently imported from China. Finding a local source of viable clay to produce ceramic proppant is important as a way to cut costs, getting more value out of oil and natural gas produced through the fracking process. In the past, when ceramic proppant has been in short supply, companies have been forced to either delay their fracking jobs or switch over to a quartz-sand proppant substitute.

Fortunately for the industry, great swaths of southwestern North Dakota have been blessed with large quantities of easily accessible clay material.

Fortunately for the industry, great swaths of southwestern North Dakota have been blessed with large quantities of easily accessible clay material. Geological maps indicate that one of the clay beds reaches from Mandan all the way down to Hettinger, and through to the Montana border. Another clay bed extends from the town of Hebron, past Dickinson, and towards Stanley.

"Our calculations indicate that there are about 1.7 billion tons of usable clay," says Ed Murphy, State Geologist of North Dakota. "Certainly, it could be used to not only meet the needs here in the Williston Basin, but potentially in other places, too."

The clay in the region has been used for over a century in the making of bricks. "We have always known that it's good, reliable clay that is also good for ceramics," says Murphy. "However, what we didn't have a good handle on was how variable the range of alumina was in the clay, and the variability from site to site. This is what we needed to look at."

The clay mineral kaolinite is one of the components used to create ceramic

proppant. It is a very stable type of clay and is relatively abundant throughout North Dakota. What makes kaolinite desirable in the ceramic proppant process is that it tends to run high in aluminum oxide—or alumina.

Two years ago, the NDGS mapped out the kaolinite deposits in the region, then, using those maps, collected the 200 samples to be further studied by NDSU.

"We then sent them off to NDSU for analysis to look at the oxides, primarily focused on aluminum oxide or alumina," says Murphy. "And now NDSU is doing additional analysis to determine what percentage is found in the kaolinite clays."

"We use two analytical techniques," says Philip Boudjouk, vice-president for Research, Creative Activities & Technology Transfer at NDSU. "One technique is using x-ray fluorescence, from which we are able to tell the different type of individual atoms in the sample and get qualitative and quantitative information. Then we use x-ray crystallography to tell us how those atoms are arranged and in what compounds. It is from that information that

we saw the aluminum and oxygen atoms are bound to form alumina.”

“The preliminary results came out in October and gave us an interesting level of alumina, showing promise for that material to be used as proppant in the fracking process.”

Although the results are indeed promising, the NDGS will acknowledge that with the alumina at roughly 25 per cent of load, they do not show quite the levels that would be considered ideal for use as a proppant material.

“From what I know, generally 40 per cent and above is very desirable,” says Murphy. “We would have liked to have seen the results above 40 per cent but I am thinking that in the mid-20s, that this could possibly still work.”


Companies interested in using the clay in their fracking operations will now be able to take the material in order to perform tests and manufacturing on it to see how it holds up in the fracking process. It will then be possible to determine what needs to be done to bring the hardness levels up to levels they require.

Moving forward, perhaps what will come out of this project—aside from a potentially local-produced source of clay proppant material—will be an ongoing partnership between the NDGS, the oil industry and North Dakota’s universities and research institutions.

“We are very fortunate here in North Dakota that we have great research institutions at our universities,” says Murphy. “This marks the first time that we’ve worked with this particular laboratory at NDSU.”

As this collaboration between the NDGS and the NDSU is the first project of its type, the university sees this as an opportunity to show what it can offer to the industry in the future.

“We are going through the phase now that we have to prove ourselves,” says Boudjouk. “What we hope for the long-term is that, for the industry, we can be a solid resource for third-party analytical information. For the university to be a partner in economic development is something that fits right into our mission as a land grant university; that is to service and research to have an impact on the local economy.”

As the second round of testing comes to a close and the final results are released, both the NDGS and NDSU hope the findings reveal that the clay found in the backyard of North Dakota—already used for over one hundred years of brick making—can be used in the future of the Bakken’s oil and natural gas industry for decades to come. 



TRIVIA TIME

STIMULATION TECHNOLOGIES

Hydraulic fracturing creates greater conductivity of fluids within the formation and improved communication with the reservoir and wellbore. Components of hydraulic fracturing include hydraulic fluids and proppants used to keep fractures open. Fracturing fluids inhibit corrosion, minimize bacteria growth, carry proppants into the induced fractures, and minimize reactivity with the formation. Generally, fluids comprise water and diluted chemicals to improve properties. Proppants include sand and ceramics of specific sizes, strengths, and treatments that increase the likelihood for proppants to remain in the formation versus flowing back to the surface with fluids.

FRACTURING FLUIDS

Generally, treatments in the Bakken use water-based fluids. Fracturing fluids need to be viscous enough to create a fracture of adequate width, maximize fluid travel distance to extend fracture length, transport large amounts

of proppant into the fracture, and utilize gelling agents that break down to allow flow back of fluid and reduce flow back of proppant.

Fluid additives clean up the formation, prevent leakoff and reduce surface tension. Generally, 99.5 per cent of fracturing fluid is made up of water and sand and the other .5 per cent is made up of additives including biocides, fluid-loss agents, enzyme breakers, acid breakers, oxidizing breakers, friction reducers and surfactants. Primary categories for fracturing fluids include gelled fluids (linear or cross-linked gels), foamed gels, water and potassium chloride or combinations of the above.

PROPPANTS

A proppant is a fluid additive used to hold the fracture open and allow the flow of reservoir fluids. Proppants typically comprise sand or manufactured ceramics and can be resin-coated to improve packing, which helps the proppant stay in place. Resin coatings help provide better distribution of stress over the proppant pack. Proppants are specified in grain diameter sizes of less than 1/16 of an inch. Common mesh sizes are 16/20, 20/40, 30/50, 40/70 and 100. Treatments use one size or many during pumping; smaller sizes reach closer to the fracture tip. The proppant pack is lower in permeability than the surrounding rock matrix, providing a conductive fluid pathway. Challenges involve placement of proppant, prevention of crushing or embedment, plugging at restrictions, and potential flow back of proppant to the wellbore.

Source: www.undeerc.org/bakken/stimulation-technologies.aspx

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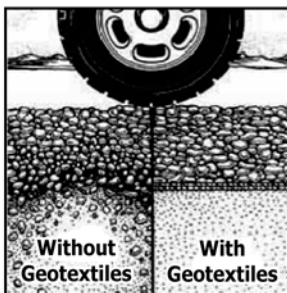
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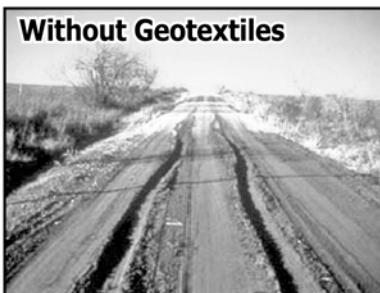
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Legislative Line

With all of the oil play taking place in the Bakken and surrounding areas, federal changes will have an impact on the industry, those working in it, and those living among the action. Learn more about the changes taking place and how they might affect the industry in the following messages from Sen. John Hoeven, Rep. Kevin Cramer and Sen. Heidi Heitkamp.



By Sen. John Hoeven

As North Dakotans, we are well aware that the eyes of the entire country have been focusing on the tremendous economic growth occurring across our state, especially in the oil patch. The growth has rightly garnered significant praise and attention, leading, I imagine, to many of us hearing the same questions: *How have you achieved the lowest unemployment rate in the country? How does North Dakota consistently rank as a top state for business? How have you created so many jobs? How can the rest of the country achieve similar success?*

North Dakota Can Serve as a Model for the Nation


North Dakota's growing energy industry has been a dynamic contributor to our state's tremendous economic success. For that reason, it is important to underscore how North Dakota's comprehensive approach to energy development can serve as a model for the nation. Such an approach will unleash the potential of our country's abundant and varied energy resources, boost our economy, create jobs and strengthen our national security.

The United States' vast energy resources, coupled with new technology, innovation and cutting-edge practices, offer enormous potential for our nation to not only grow our economy and create jobs, but also to achieve our long-sought objective of energy security, which means producing more energy than we consume. To get there, though, we need to adopt a pro-growth approach to energy development on a national level that will promote investment and deploy the new technologies that will produce more energy with better environmental stewardship for America.

In the Senate, I have been working with my colleagues to develop and implement comprehensive energy legislation like we have in North Dakota. One measure I have

introduced, the Empower States Act, would ensure that states retain the authority to manage hydraulic fracturing. Our bill takes a states-first approach because individual states are the first and most interested responders to oil and gas issues. States know their land, their geology and their water resources, and have a primary responsibility to protect their environment and their citizens.

The Domestic Energy and Jobs Act (DEJA) is another bill I am working to pass. DEJA is a wide-ranging package of 13 diverse energy bills that is designed to streamline and simplify regulations, boost domestic energy supplies, build American energy infrastructure and safeguard America's supply of critical minerals.

Implementing policies like the Empower States Act and DEJA can remove bureaucratic barriers and enable our nation to develop more of our energy resources with good environmental stewardship. Implementing these policies will create jobs, boost our economy, reduce our debt and deficit, and make our nation more energy secure. Duplicating North Dakota's success on a national level is achievable, and that is what I am working to do. 




Common Sense Approach to Legislation & Enforcement

By Rep. Kevin Cramer

It's not hard to notice that our nation has seen an oil and natural gas production renaissance over the past few years. The success of which is credited to those who have developed and refined the hydraulic fracturing and horizontal drilling process. The rewards have also been reaped by those governments and property owners who have worked in a cooperative manner with oil and natural gas producers.

A lot of concern over the hydraulic fracturing process has swept the nation and, thus, their government has been called upon to ensure human and environmental health. State and local governments, like North Dakota, have responded with thorough regulations and continued surveillance of the entire oil and natural gas development process, including hydraulic fracturing. The federal government has studied, and will continue to study, the process and should share their scientific findings with state and local governments.

The bottom line is that enforcement is being done and federal regulation isn't necessary in states like North Dakota. If a state fails to take on enforcement responsibilities, then federal involvement may be necessary. Legislation like the Empower States Act of 2012, sponsored by my Sen. John Hoeven, is a common sense approach to this issue. 



Ensuring Issues Don't Impede Progress and Development in North Dakota


By Sen. Heidi Heitkamp

Serious challenges could impede efficient and effective oil and gas development in the Bakken. Sen. Hoeven and I introduced legislation to address the backlog in drilling permit approvals at the Bureau of Land Management (BLM). It takes less than 30 days to obtain a permit to drill on private land in North Dakota; for federal land, it takes almost 300. The legislation would allow a BLM one-stop-shop in Miles City, MT to alleviate North Dakota's backlog. Sequestration could impact permitting on federal and Indian lands; my office is working with BLM and the Bureau of Indian Affairs to ensure they can maintain current staffing levels. It makes no sense to divert resources from an activity producing significant revenue returns for the federal government.

The impending BLM rule for hydraulic fracturing on federal and Indian lands could severely impact and impede development.

I have pressed to maintain the current state-based regulatory system. Only Washington would craft a one-size-fits-all rule to govern an activity in such varied environments and geological formations. I will advocate against any redundant or unnecessary federal regulations on companies operating in North Dakota.

Many in Washington have railed against "tax subsidies" enjoyed by oil and gas companies. This shows a lack of understanding of the tax code, especially percentage depletion and intangible drilling costs. These provisions allow deductions on ordinary, necessary business costs and depreciation, and are available to all businesses in some form within the tax code.

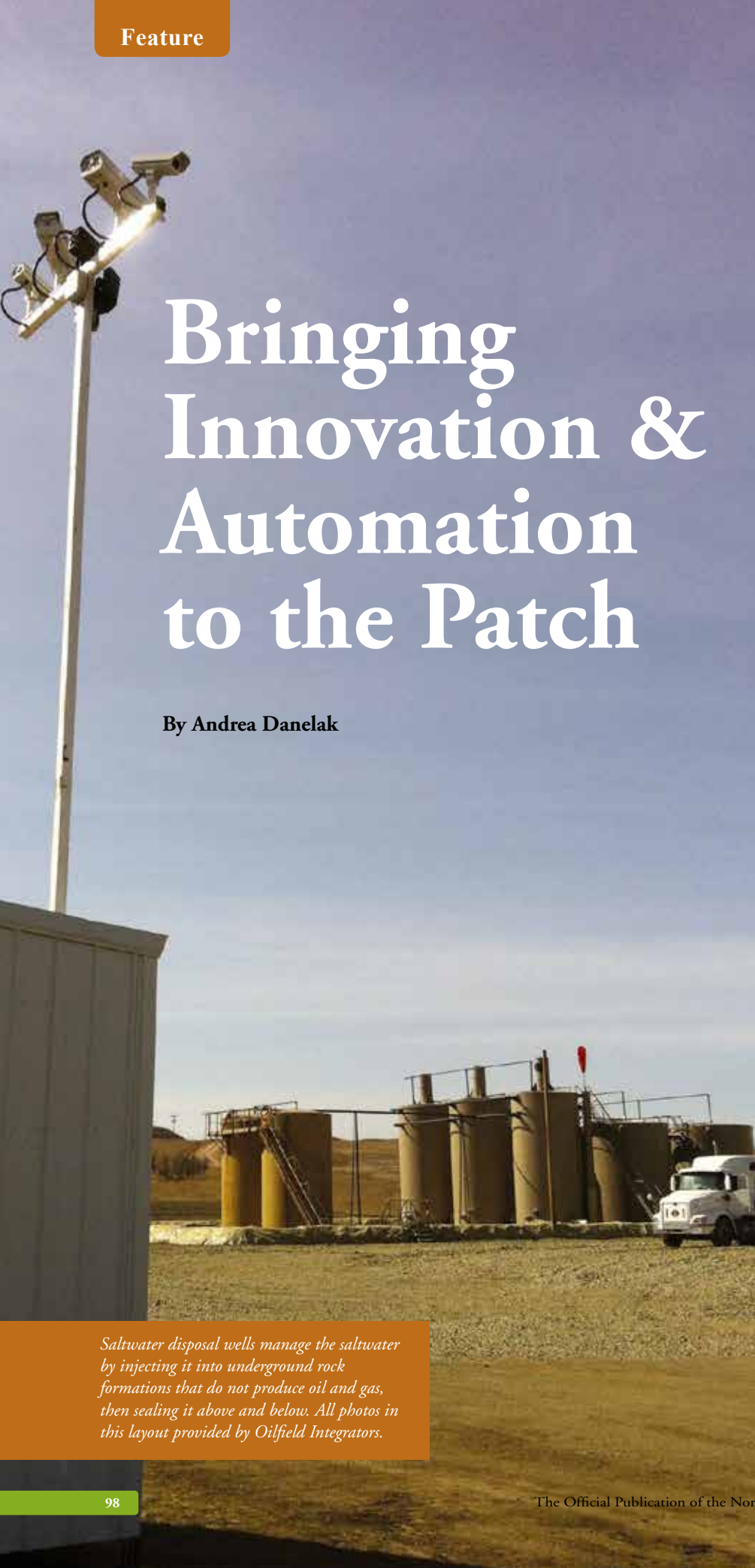
While North Dakota enjoys robust energy development, all activity could slow to a crawl if these issues are not addressed. I work every day to ensure they do not impede progress and development in North Dakota. 



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Bringing Innovation & Automation to the Patch

By Andrea Danelak

Saltwater disposal wells manage the saltwater by injecting it into underground rock formations that do not produce oil and gas, then sealing it above and below. All photos in this layout provided by Oilfield Integrators.

North Dakota's oil boom is showing no signs of slowing down, and companies are now searching for ways to make production more efficient, more cost-effective and safer. One of the ways in which companies can meet those objectives is through the use of a unique well system.

Oil and gas reservoirs are usually found in porous rocks, meaning that the disposal of saltwater that sits in the rocks—and accompanies the oil and gas to the surface—is a significant issue for oil companies. Though there are several ways to dispose of the water, one method that has been increasing in popularity is saltwater disposal (SWD) wells. SWD wells manage the saltwater by injecting it into underground rock formations that do not produce oil and gas, then sealing it above and below.

“There is a strong need for more SWD wells due to the tremendous amount of wastewater,” says Todd Harris, a solution provider with Oilfield Integrators. “It’s still very much a growing industry but the need is so large.”

Formed in 2010, Oilfield Integrators has seen great success in the SWD industry, providing integrated solutions to address production, security and safety management concerns in the oil and gas industries.

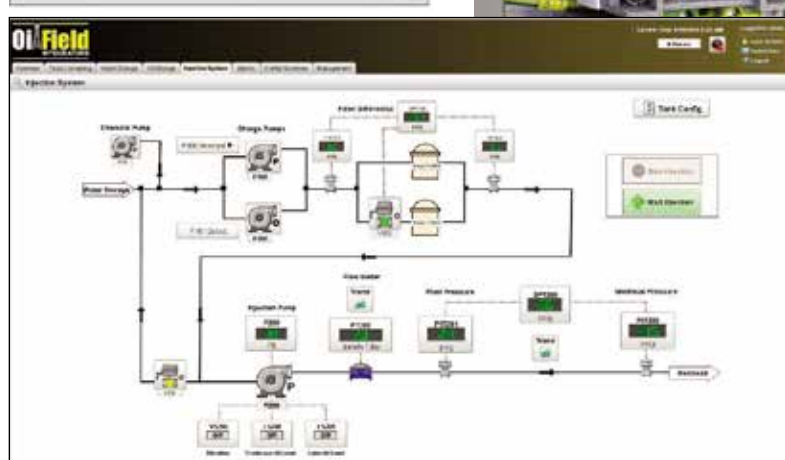
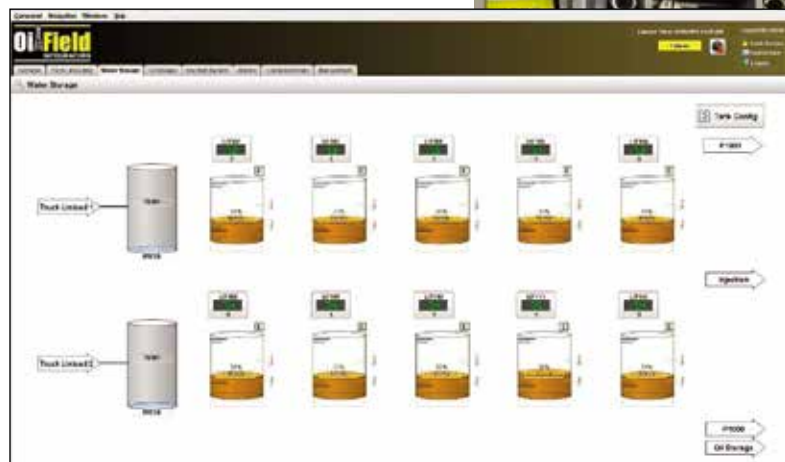
“We can design and build every aspect, from electrical to communication, and work with a number of different companies,” says Harris, whose team consists of consultants, engineers, electricians and technicians who work together to provide companies with solutions customized to their needs. Oilfield Integrators provides services not only to SWD well sites, but also to production oil wells, water depots, rail terminals, refineries and crew camps. “With all of our resources pooled together, we can do some pretty amazing things for clients who want to gain efficiency and be more profitable,” says Harris.

Establishing an SWD well site takes approximately 45 to 60 days. The first steps include the permitting process, as well as identifying a suitable location for the site, and next comes the search for mechanics, contractors, automation crews and so on.

“Then, we can begin building the site—starting with the underground piping, building containment walls, wiring the site,” says Nathan Livingston, engineering manager with Oilfield Integrators. “Finally, we do a final walk-through check, with a state electrical inspector coming in.”

As part of its offerings, Oilfield Integrators provides automation and control systems to ensure that SWD well sites operate with

Supervisory Control and Data Acquisition (SCADA) and Human Machine Interface (HMI) software used to manage and run a saltwater disposal site. With HMI software, sites can be completely managed and controlled remotely.



minimal staff. "The process requires automation or it would take five or six people to operate a facility day-in and day-out," says Harris.

Additionally, the company can integrate video surveillance into the automated control scheme, offering a major benefit to its customers. "Our customers can view their sites remotely, not only having readings and reports, but also real-time information: who was at the site yesterday, who is there currently, etc.," says Harris. "We're basically offering full situational awareness and control, remotely."



Oilfield Integrators can design and build every aspect of the saltwater disposal well, from electrical to communication, to provide companies with solutions customized to their needs.

One of the primary advantages to choosing SWD wells over other disposal methods is safety.

SWD wells offer a multitude of other benefits to oil companies. One of the primary advantages to choosing SWD wells over other disposal methods is safety. "There is a tremendous amount of safety value added because there is less physical contact on the site," says Harris, referencing the automation and video surveillance systems. "You can look on a computer screen and see how everything is operating."

Another advantage to using SWD wells is the streamlining of the actual wastewater disposal process. "With other methods, there are multiple steps in transporting the material. With SWD wells, there is minimal processing and handling of the material," says Livingston. "Injecting the water thousands of feet into the earth is a more efficient process overall. It's much safer than other methods."

Despite benefits like cost savings, increased efficiency and safer sites, there are challenges associated with SWD wells, including the high activity level at the sites. "There are a lot of moving

parts in those facilities," says Harris. "They're extremely busy, with a tremendous amount of pumps working."

Related challenges stem from maintenance and staffing issues. "Maintenance is typically high-cost, so it's not something like a \$15 oil change," he continues. "And as with any industry in North Dakota right now, staffing is another issue."

Another major challenge stems from site location—more specifically, access to high-speed Internet, or lack thereof. "It can be a struggle to get data back to the user," says Tom Boardman, who works in business development at Oilfield Integrators. "There really isn't a good bandwidth solution out there yet."

Limited bandwidth means the company cannot stream live video feeds in some locations, requiring someone to be on-site at all times. "With better bandwidth, we could run things remotely—fully run the site without having someone on-site," Boardman continues.

"We position our product and installations while keeping in mind the current limitation and knowing that the bandwidth will eventually be there. We have to look into the future to see where the industry is going."

Indeed, technology will play an important role in the future of the SWD industry. "Video surveillance adds a tremendous amount of safety value at any of these sites," says Harris. "Over the next few years, I think the industry will move very much in the same direction. The SWD business is very accustomed to the technology that we bring and they're always looking for new and better technology to help them with concerns and issues. I think we're going to see a lot of improvements in technology."

As for Oilfield Integrators, Harris predicts the next few years will be busy for the company. "We're going to continue to build partnerships with other companies in construction, consulting and engineering," he says. "We definitely want to work with other groups, and that's something that we think would provide more value to the end users. We believe that the last few years have been a learning curve for us and have gained an understanding of the industry. Our focus in the future is to add even more value to our current solutions by continuing to respond to our customers' needs."



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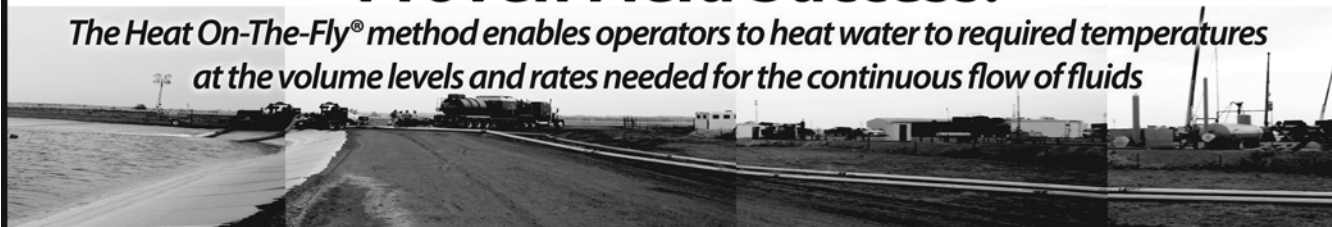
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A Real *Flair* for the Environment

By Paul Adair

As production continues to heat up along the Bakken, flare stacks are becoming an increasingly familiar site across western North Dakota. The process of burning off seemingly unmarketable or waste gas has been common practice for decades but new technologies, and an increased focus on a cleaner environment, has resulted in some companies examining their relationships with flare gas.

BLAISE ENERGY INC.

Blaise Energy Inc. started out generating electricity from flare gas at the well site, consuming the associated gas in a natural gas generator before sending the electricity back into the electrical grid. However, this method of electricity generation has proven to be impractical on a large scale; with reasons ranging from the bureaucratic to the economic.



Production in Williston, North Dakota. Photo by Ole Jørgen Bratland, Statoil.

"North Dakota is very fortunate in that it has the lowest electrical rates in the country," says Mark Wald, co-founder of Blaise Energy Inc. "Unfortunately, when you are producing electricity as your revenue source, it makes it difficult from an economic standpoint to remain viable. So, in the end, going back into the grid proved to be a difficult model to follow. Instead, we found it much more feasible to power other industrial loads straight from the gas and not go parallel to the grid."

"It is far easier and much faster to power our wells directly, generating site power from gas prior to it getting to the grid," Wald continues. "We have also become interested in developing private micro-grids, where we are powering a gas plant using natural gas as the only source of power."

As the technology and knowledge increases in the Bakken, Blaise Energy Inc. sees future opportunities in using the rich natural gas reserves in ways other than simply generating electrical power.

"Site power is a logical first step," says Wald. "But as we gain more experience and more capabilities in using natural gas rather than diesel or gasoline, I envision all kinds of prospects beyond electricity production."

Rather than taking on the task of

developing new innovations on its own, Blaise Energy Inc. has formed strategic partnerships with others who share similar goals in the reduction and the eventual elimination of flaring.

"We've partnered with another company to do liquid knockout and pulling out the natural gas liquids," says Wald. "It's a tremendous opportunity and I can see that it's where it is all heading."

"I believe that America is going through an energy transformation; however, the significant game-changer will be in determining how to approach it differently and how to create additional markets for that natural gas. We need to take an approach to flaring that's smarter, more efficient and definitely cleaner."

STATOIL

Norwegian-based oil and gas company Statoil is also looking at new ways to reduce flaring gas in the Bakken.

"We are working on all kinds of ways to use this flared gas," says Lance Langford, vice-president in the DPNA Bakken business unit. "But it's not really about the reduction of flaring; we are trying to eliminate flaring and any kind of emissions related to flaring."

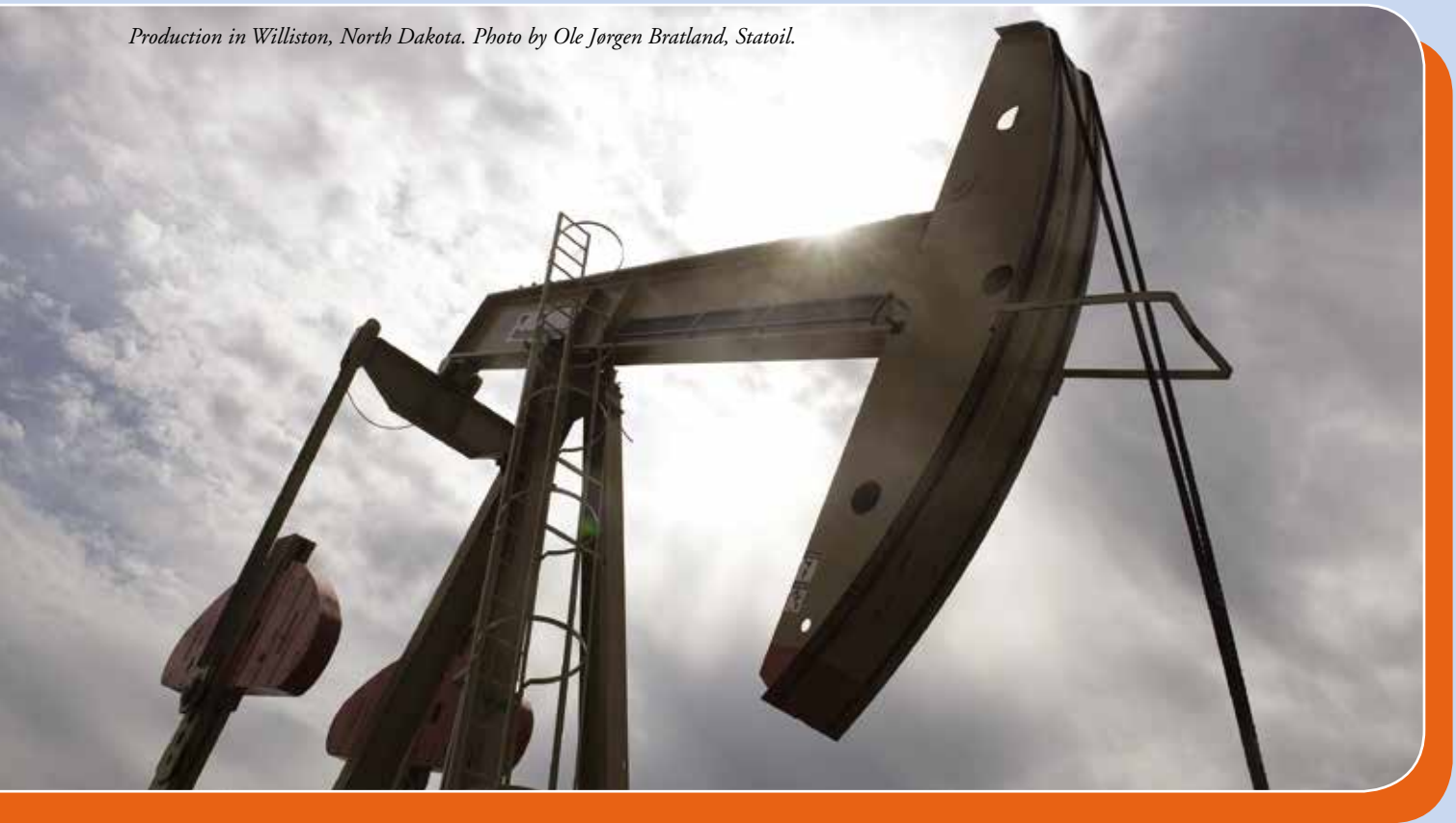
"The best way to eliminate flaring of this gas is to move it completely out of the Basin via large transportation pipeline," Langford continues. "In 2009, we had the processing capacity to move 80M cubic feet of gas per day out of the basin. Today, we are approaching 400M cubic feet per day in processing capacity and we expect it to be at 600M cubic feet per day by 2015."

Today, the transportation of the associated gas out of the Bakken is limited by the gathering infrastructure currently in place to move it from the well to the gas processing plants.

"The issue for us today is that we don't have optimized pipeline systems," says Langford. "This means that we have to get the pipeline capacities right by either looping it, laying additional lines, using bigger lines or by using booster pumps, so that you can pump more volume at a higher pressure. So, what we are doing today is trying to optimize our lines to get all of our gas out."

Currently, Statoil is exploiting the flare gas by using bi-fuel systems on their drilling rigs, a system that greatly reduces the rig's dependence on diesel as a primary fuel source.

"We have nine rigs right now that are using a bi-fuel system to run," says Langford.



“Bi-fuel allows you to replace about 60 per cent of the diesel with natural gas, benefiting us in a couple of ways. We can use natural gas directly from the wells, getting more value from them and we also lower emissions significantly.”

“It’s true that it initially costs some capital to put the packages on the rigs but once you get them on there, there are significant savings. With each well that you can convert, you can reduce your costs by about \$3,000 per day per rig, while also significantly reducing emissions.”

Langford says that as a company, they are always looking for ways to make money but that their ultimate goal is to eliminate flaring. “As such,” he says, “our decisions are not always going to be based purely on the economics.”

NORTH DAKOTA CORN GROWERS RESEARCH AND PROMOTION COUNCIL

The North Dakota Corn Growers Research and Promotion Council (NDC-GRPC) recently partnered with the North Dakota State University (NDSU) in a project to examine the use of flare gas of the Bakken towards the production of nitrogen fertilizer.

“There has been a lot of interest in it,” says Dave Ripplinger, assistant professor in the Department of Agribusiness and Applied Economics at NDSU. “At NDSU, we completed a study a few months ago that examined the economics and environmental

benefits of harnessing the flare gas and then converting it to nitrogen fertilizer.”

Unfortunately, the numbers were not encouraging as the results of the study began to come in.

“I am an economist and I just do the math,” says Ripplinger. “Using existing technology and using all the assumptions we have on collecting the gas, and then using a centralized place to convert it, we just found that the economics didn’t work. The product has value but only to a point. It’s just not quite valuable enough for people to go and collect the flare gas.”

The issues coming out of the study were related to scale. The size and scope of a fertilizer production facility is simply too large to allow the project to be feasible in terms of infrastructure investment.

“What we looked at was actually collecting it at a small scale but not as small as some people think,” says Ripplinger. “Most nitrogen fertilizer plants are extremely large and they use a great deal of natural gas every day—around the amount to heat a city of 50,000 people in the winter. To collect that much gas takes a lot of resources, even in the Bakken, where there is so much of it. It just didn’t pencil out and it really wasn’t even close.”

Moving forward, the NDCGRPC has found more opportunity in adopting more traditional methods of fertilizer production, by allowing the associated gas to be collected

by others and then having it transported to a proposed nitrogen fertilizer plant through a permanent piping infrastructure.

“We are going to use the natural gas from the state of North Dakota but we are not planning to go to go out and collect flare gas,” says Ripplinger. “We will not be going out to a remote wellhead and collecting the gas in storage tanks and then converting it on-site or transporting it to another place to convert it. Instead we are going to use the infrastructure that is being built.”

“What we are doing,” Ripplinger continues, “is we are going to leverage the existing natural gas collection infrastructure that a large company would build and then buy it like any other natural gas customer. We are not going to go out and go through the collection process as was originally envisioned.”

This is not to say that in the future—as technologies advance—that there will never be a solution for collecting Bakken flare gas and then using it in fertilizer production.

“There are others that might get it to work, who are using different assumptions or different technology,” says Ripplinger. “If it would work, it would be a wonderful idea. Essentially, you are taking a waste product and putting it to use as something that has a high value. If you can turn that low cost or no cost flare gas into something positive, then you have one heck of a business there.”



Non-Hydraulic Fracturing: A Peek at the Next Issue of Basin Bits

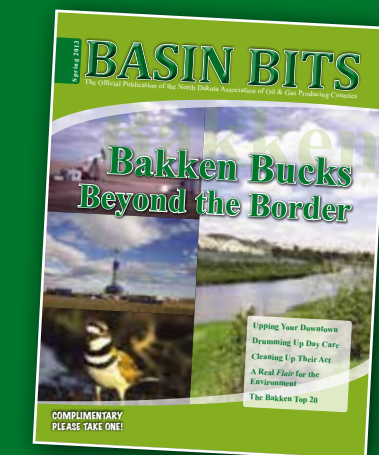
The recent revolution in the production of oil and gas from shale formations has led to a new era of energy prosperity and energy security in North America. However, the primary technology used today for shale production—hydraulic fracturing—uses large amounts of water, injects chemicals into underground formations, requires treating and disposing large volumes of fracing wastewater, and requires a large number of water/wastewater truck trips per well.

Industry companies are using innovative techniques to develop processes that eliminate the use of water and chemical additives while lowering costs, maintaining or increasing well productivity, and enabling other benefits.

Expansion Energy in New York has patented “VRGE™”, or Vando’s Refrigerated Gas Extraction, technology, which uses cryogenically processed natural gas from the targeted hydrocarbon formation itself as the fracturing and proppant-delivery system. VRGE

uses “CCNG™”, or cold compressed natural gas, produced at the well site, which is first sent down the well bore to “thermally shock” the formation through exposure to extreme cold (delivered by CCNG), creating initial fissures. The natural gas is then returned to the CCNG plant at the well’s surface, where it is further cooled into a pumpable state, then pumped to high pressure and subsequently warmed to produce a high-pressure compressed natural gas (CNG), which creates more fissures in the underground formation (and expands existing ones), while delivering proppants to hold open the fissures.

Technologies like the VRGE approach do not require any changes to the pre-fracturing stages of a well’s development (the drilling and perforation of the well bore). After completing the fracturing of the formation, the well can be operated just like today’s hydraulically fractured wells. Additionally, the CCNG plant (and its deep refrigeration) can be used to convert the gas into LNG at the surface and/or to extract/fractionate natural gas liquids—propane,



butane and ethane—from the gas stream. The CCNG plant can also be used to capture associated gas from oil wells that would otherwise be flared, and convert that gas into LNG for easier transport to market.

Keep an eye out for the Fall 2013 issue of *Basin Bits*, which will highlight this innovative new technology, how it’s being used in North Dakota, and the impact it will have on the industry!

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Flaring Alternatives

By Paul Adair

The Bakken is highlighting the enormous potential in the region for industries involved with oil and natural gas—potential that will only grow as projections have the number of wells increasing over 2,000 annually over the next two decades.

With this increase, there will also be an increase in the amount of associated gas being flared; long seen as an environmental blight and economic waste. However, as technologies improve, what was once seen as a mere byproduct of oil-gas production, is now regarded as a prospective valuable resource waiting to be harvested.

PRODUCE LNG DIRECTLY AT THE FLARE SITE



Expansion Energy's VX™ Cycle technology uses very deep refrigeration that allows natural gas liquids (NGL) to be extracted directly from the gas stream.

One of those enterprising companies looking to take advantage of the flared gas is Expansion Energy. Based out of New York with a satellite office in Bismarck, ND, this company is using its breakthrough VX™ Cycle, an ultra-small scale liquefied natural gas (LNG) production technology, as a solution to the problems associated with flaring.

"LNG is produced in many gas-rich regions around the world at a very large scale,"

says Jeremy Dockter, co-founder and managing director of Expansion Energy. "They produce millions of GPD at the largest LNG facilities. But that scale would never work for individual well sites. For that scale, nobody else besides Expansion Energy has a cost-effective LNG solution."

It is the small size and mobility of the VX™ Cycle that sets it apart from the competition and makes it a unique choice for operators in the Bakken. Fully-automated and capable of generating its own power, a typical 6,000 GPD unit sits on two trailers that can be quickly assembled and put to producing LNG directly at the flare site.

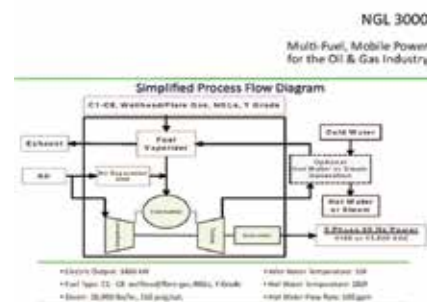
"Instead of flaring that gas, you can take it, put it through our VX™ Cycle plant, and what you get out of the process is LNG that can be transported back out by truck," says Dockter. "That LNG can then be used in a variety of upstream applications, such as fueling drilling rigs, frac pumps, field trucks or even trucked to nearby gas processing plants or pipelines where it can be re-gasified and sent to market."

The VX™ Cycle technology uses very deep refrigeration that allows natural gas liquids (NGL) to be extracted directly from the gas stream. "As NGL has a higher value than even the methane that goes into making the LNG, you can then choose to sell the NGL as a separate product entirely," says Dockter. "You are able to do two things at once with our single technology."

Expansion Energy has recently licensed the VX™ Cycle technology to Dresser-Rand, a giant in global energy equipment manufacturing. This allows Expansion Energy to hand off the responsibility of manufacturing, marketing and maintaining the micro-plants to a company able to do it virtually anywhere around the world.

"Dresser-Rand's plan is to mass produce VX™ Cycle plants," says Dockter. "So—over time—we are hoping to see thousands of these plants in the field across North America and across the globe." If you keep an eye out, these plants could soon be popping up all over the Bakken.

CONVERT LNG INTO A SYNTHETIC NATURAL GAS ALTERNATIVE



LPP Combustion technology can use flare gas to generate electricity for wellhead applications.

LPP Combustion has developed technologies that can convert LNG into a synthetic natural gas alternative that can then be run in reciprocating engines and gas turbines as if they were a true natural gas.

"We provide a fuel-processing skid on an on-demand basis with our patented modular technology," says Chris Broemmelsiek, vice-president of sales and marketing for LPP Combustion. "We vaporize a wide variety of liquid and gaseous fuels from the flare gas and NGL so that we can later run it in reciprocating engines and gas turbines as if it were a natural gas."

For drilling and fracturing rigs in remote locations, where access to natural gas or natural gas pipelines is unfeasible, the idea of using flare gas as a cheap and ready source of power can be appealing. With a projected 35-40,000 wells to be drilled over the next 15 years in North Dakota, LPP Combustion is banking on there being a market that will be looking to switch from a high-priced fuel source to their lower cost alternative.

That being said, however, there is always a challenge in introducing new technologies to an industry focused on keeping their companies out of the red.

"It is always difficult for companies to adopt a new technology when they are busy making money using the technology that's already in place today," says Broemmelsiek. "It's always easy to propose to do it better, cleaner and cheaper, but the industry always looks for demonstration projects and proof of technology before it is willing to invest a substantial amount of capital."

Recently, LPP Combustion received its first commercial order from Arizona-based Worldwide Water Solutions to power a mobile water treatment system. Although this is a great first step, they are always continuing to seek out new opportunities in the field in order to deploy and show off the very tangible benefits of their technologies.

"We are now looking for other people that want to potentially use flare gas to generate electricity for wellhead applications," says Broemmelsiek. "We've proven out the technology on small micro-turbines in our facility and have received several thousand hours of operation in our lab. We've been able to demonstrate our ability to turn about 14 different types of fuels into a natural gas equivalent fuel. And we think that what we have here is a very winning technology."

When dealing with the flaring of associated waste gas related to the oil industry, it is difficult to separate environmental issues from economic requirements. Fortunately, LPP Combustion sees that the two go hand-in-hand and do not have to be at odds with each other.

"We know that people look at the bottom line, then follow environmental regulations when they have to," says Broemmelsiek. "But if you could convince someone from an economic standpoint and then gain the benefits of an 80 to 90 per cent reduction in emissions to along with it, then I think that we have a compelling reason to go forward with our technology."

"We've received interest in places like the Middle East, Russia, eastern Africa and across North America," Broemmelsiek

The VX™ Cycle technology uses very deep refrigeration that allows natural gas liquids to be extracted directly from the gas stream.

continues. "Because of this, we believe that there is a real global market for using this flare gas in a much more efficient and cost-effective way, replacing not only fossil fuels but also reducing overall global pollution."

REFRIGERATE AND PROCESS NGL INTO PROPANE, BUTANE OR PENTANE



G2G Solutions' patent-pending process controls the volatile flow rate of the gas stream at the flare, separating the most valuable and carbon-rich portions of the gas stream from the less valuable parts.

A fairly recent player in the Bakken, G2G Solutions is doing its part in reducing the burning off of associated waste gas, while looking to maximize the value of this once untapped commodity.

"I believe that everybody who drives through North Dakota and sees the flares realizes that a valuable natural resource is being wasted," says Mark Peterson of G2G Solutions. "As entrepreneurs, the opportunity that we saw was to fill a need of the industry to reduce those emissions and to capture some of those natural resources for everyone's benefit."

G2G Solutions is using its technologies to capture the rich natural gas liquid portions of the flare gas stream. From there, these portions can be processed into valuable commercial products, such as propane, butane and pentane.

"In the flare right now, it is at a certain pressure and a temperature where the stream remains in a gaseous state," Peterson says. "What we are doing, is we put it into our system and then compress and refrigerate it to draw out what we call the rich natural gas liquids."

Much of the success of G2G Solutions currently enjoys depends on its proprietary patent-pending process, which controls the volatile flow rate of the gas stream at the flare.

"The flares fluctuate wildly in volume," says Peterson. "They can be really going great—around 1.5 MMcf/day—and then suddenly drop to a third of the rate. There is a tremendous amount of variability and you have to be able to handle the surges in the well. And that's exactly what our patent-pending technology does."

As G2G technologies sap off the most valuable and carbon-rich portions of the gas stream, the less valuable parts, such as methane or ethane, will continue to pass through the system and can be utilized as preconditioned fuel for bi-fuel engines to reduce diesel usage, become a viable feedstock for other technologies, or be passed on to the flare and burned off.

"Everyone is talking about carbon as it relates to greenhouse gases," says Peterson. "And what we are taking out are the larger carbon molecules that are the biggest component of natural gas."

Where a company like G2G Solutions has a leg up on its competition is that it utilizes tried and true methods to capture the carbon-rich NGL and the methodology has passed from theory to practice in the Bakken.

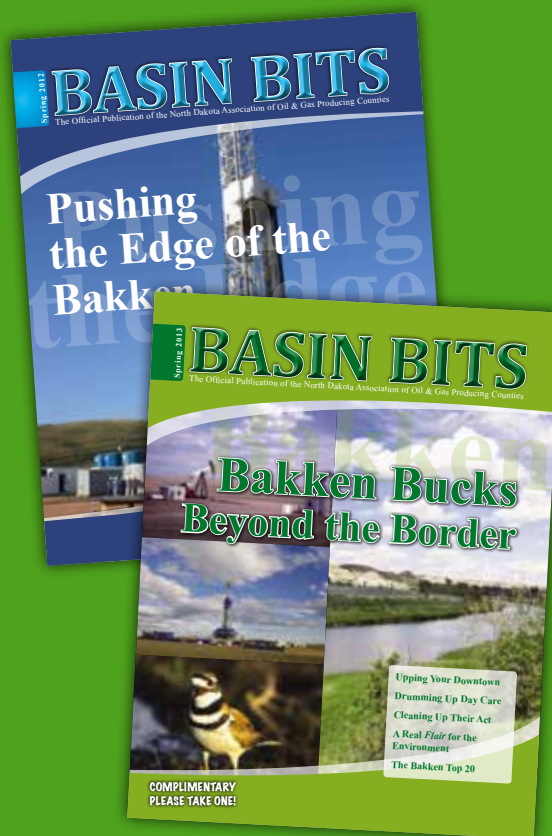
"There are problems with most of the proposed technologies," says Peterson. "But we've already proven that our technology works and we have a field history where we have recovered these liquids. We use standard mechanical refrigeration that is tailored for flare gas treatment. We are doing what works now."

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Did you know that Basin Bits is distributed to thousands of industry professionals in the 19 oil and gas producing counties in North Dakota, including all on-site drillers, the ND Petroleum Council, the ND Oil and Gas Commission, the ND Oil and Gas research council, the University of ND, the landmans association of ND and to state and trucking companies and legislators?

This publication is also available to county auditors, county commissioners, online at www.ndenergy.org, in the NDAOGPC office in Bismarck and at industry events, like the annual Williston Basin Petroleum Conference!

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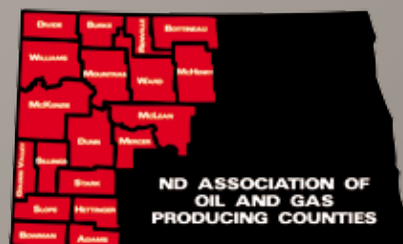


Become an Associate Member of the North Dakota Association of Oil & Gas Producing Counties

Oil and gas industry members, economic development organizations and other private businesses doing business in the Bakken are welcome to sign up their organizations for an Associate membership through the NDAOGPC online signup site.

The \$500 yearly membership fee for Associate members offers a variety of advantages, including networking opportunities with county, city and school district officials of the oil patch at various association functions throughout the year. An Associate Member Committee was established during the 2011 NDAOGPC Annual Meeting, offering the opportunity for members involved with the oil and gas industry to meet and better interact with officials in the areas in which they operate. Associate members are also featured through member profiles (like the ones on pages 109 and 112 of this magazine) in the biannual NDAOGPC publication, Basin Bits, which is distributed throughout the Bakken and the state.

More information on how to become an Associate member and its benefits can be found by contacting the NDAOGPC office at (701) 751-3597 or e-mailing Deputy Executive Director Brady Pelton at brady.pelton@midconetwork.com.



SRF Consulting:

Hard Work, Innovation & Excellence

By Jim Taylor

In just a few short years, the Bakken oil play has experienced a growth spurt unlike any other. With the integration of modern technology, the area has gone from a cluster of wells producing a few barrels of oil to a vast deposit that is thought to be capable of yielding over four billion.

But an oil boom can only be as fruitful as the infrastructure that surrounds it. Oil cannot transport itself, and a great deal of design and planning must go into the transportation systems that carry it to market. SRF Consulting Group is there to make sure these systems are designed and operating smoothly.

Established in 1961, SRF has grown into a full-service engineering and planning consulting firm, with offices in Minneapolis, MN; Bismarck, ND; Fargo, ND; Minot, ND; Madison, WI; and St. Louis, MO, and a roster of over 250 experts in the field.

Part of SRF's recipe for success is their careful selection of quality employees. Those hoping to work with SRF must be prepared to be dedicated, team-oriented and multi-disciplined. The firm boasts a high rate of employee retention, with a large percentage of staff who have been with the company for decades. This is due, in large part, to SRF's dedication to personal growth, ownership of work and the unique set of opportunities that each project has to offer. The company's

Highway 23 in North Dakota. All photos in this layout provided by SRF Consulting.



professionals work with a wide range of municipal, county and state agencies.

"SRF takes pride in taking part in complex infrastructure projects, and we tend to attract people who are interested in challenging, high-level projects," says Lisa Harry, SRF's Communications Manager. "A shocking amount of change has taken place in western North Dakota, and we are helping

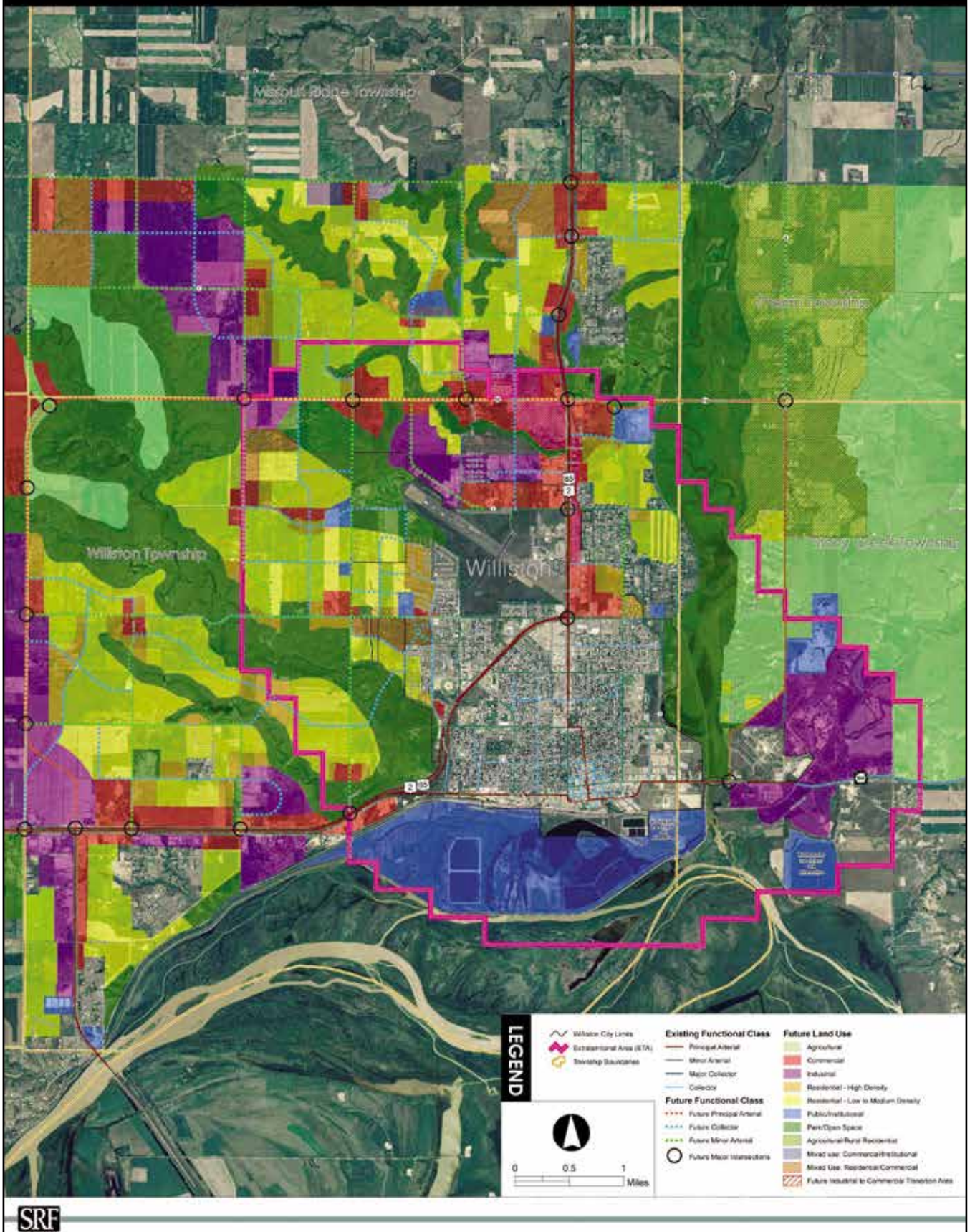
our clients with the corresponding amount of infrastructure needed to support this growth."

A major part of this effort is collaborating with public officials to get them up to speed on the issues like zoning ordinances, and helping them deal with the huge flurry of paperwork that's pouring in as fast as the oil itself. As the impact of the Bakken oil

FUTURE LAND USE

Williston, North Dakota

A map of future land use in Williston, ND.



SRF fills many infrastructure needs, like this bridge in Minot, ND.



play grows, so does the urgency to respond accordingly. To ease the growing pains of the communities affected, SRF has moved quickly to address immediate short-term needs, prepare the region for economic diversification and set the stage for additional development, Cindy Gray, a senior associate with SRF, explains.

“A lot of the officials who are in charge of zoning ordinances in these areas haven’t had to use them in the past because their areas weren’t being developed. Often, issuing ordinances isn’t their primary responsibility, since their title involves them wearing many hats.”

To deal with this, SRF assisted in providing training seminars targeted specifically at public officials, helping them cope with the rapid changes their communities are experiencing and the paperwork that’s involved. These sessions, like the ones that were held in Stanley, ND and Dickinson, ND in November and December of 2012, are being gratefully received and are well attended. The workshops are comprehensive in scope and cover all the bases, ensuring that attendees are aware of current best practices in areas like jurisdictional mapping, subdivision regulations, and the state century code for both counties and municipalities.

“In some areas, public officials need to get caught up on development that’s already taking place” Gray says. “Others, on the outer fringes, are seeing what’s going on and are able to better prepare

With their team of engineers, landscape architects and water resource specialists, the company is also able to find sustainable solutions to environmental challenges.

themselves. By having their zoning ordinances in place, these communities are able to put themselves in the driver’s seat. The industry doesn’t drive the standards for them. They’re able to make their own decisions.”


Actively supporting public sector agencies is a big part of the reason why SRF is one of the most respected consulting groups in the Midwest, but assisting companies in the private sector is also important. There’s plenty of work that needs to be done, and the firm’s multi-faceted approach has served it well. A scan of the company’s website shows the comprehensive list of services they offer. Bridge, highway and traffic engineering; transportation, community, and environmental planning; surveying; and construction services are just a few of the needs SRF fills.

The company’s trophy list is almost as full as its menu, with awards like the Minnesota Society of Professional Engineers’ Seven Wonders Award and the American Council of Engineering Companies’ Grand Award for Excellence being just two of many accolades they have earned in recent years. With every employee, including the company’s more than 35 principals, taking a hands-on approach to their work, SRF is making serious

headway in a sector and a region that’s being inundated with change.

When it comes to company philosophy, SRF focuses on innovation, service, collaboration and quality. They design structures and infrastructure systems that meet the needs of the traveling public, while complementing their surroundings. With their team of engineers, landscape architects and water resource specialists, the company is also able to find sustainable solutions to environmental challenges.

Since its inception in 1961, SRF has maintained a reputation based on hard work, innovation and excellence. This reputation has helped the company to grow into a highly visible, well-respected member of the consulting community. With the sudden swell in the Bakken oil play, SRF is well positioned to guide affected communities to a place where they can reap the industry’s rewards with strength and confidence.

In the words of company CEO Randy Geerdes, “It’s important for us to continue building on the reputation that we’ve carefully cultivated over the past 50 years.” With its long list of accolades and stellar reputation, there is very little doubt that SRF will remain on the top shelf of the consulting industry for many years to come. 

Weston Solutions: Providing Sustainable & Environmental Business Approaches

By Drew Kozub

Expectations are high on companies in all industries to be good global citizens and practice corporate social responsibility in all aspects of their organizations, from inside the office to out in the field—even to the partners they choose to work with.

The oil and gas industry in North Dakota is a lucrative business, providing many jobs and supporting local economies by attracting workers from across the country to our state, but it can be daunting to figure out a way to implement green strategies that go beyond the necessary legal and local regulations. Fortunately, for businesses working in the oil and gas industry, they can find a proven and experienced partner in sustainable and environmental business approaches with Weston Solutions.

For more than 55 years, Weston Solutions has been providing sustainability services to a variety of industries and sectors across the globe, with more than 1,800 staff working in 60 offices worldwide. Working with cities and municipalities, and industrial and commercial clients, Weston Solutions finds ways to offer cost-effective and industry-compliant solutions to a variety of environmental challenges, from green development to water and conservation reuse and even health and safety compliance.

For companies working in the oil and gas industry, Weston Solutions has the experience of knowing the full life cycle of an oil and gas field, which allows them to offer integrated solutions to many of the challenges faced when trying to incorporate green practices in real-world scenarios.

It's through this knowledge of day-to-day operations that Weston can find solutions for many of the environmental, engineering and construction considerations necessary for field development. Understanding how to balance green construction management while still protecting the bottom line of a project in production, or finding solutions to source materials like fresh water, or storing waste without damaging

local ecosystems, are just some of the ideas Weston Solutions can bring to the table to help out the daily operations for oil and gas companies. Helping organizations maintain good corporate social responsibility practices, without hindering operation—even when under a time crunch or an environmental pinch—is something that Weston Solutions has proven success in.

SUCCESSFUL SOLUTIONS FOR OIL & GAS CLIENTS PRE-DRILLING



A water sample is collected for a data gathering project for one of Weston Solutions' clients. Photos provided by Weston Solutions.

When clients need information fast before operations can begin, Weston Solutions can offer speedy solutions. In Marcellus, Utica and Eagle Ford Shales, they were tasked with measuring baseline water quality through sampling programs on thousands of properties. Not only did this require absolute quality data, but it needed to be done fast and explained in a way that could be shared with the public to address local concerns about shale development.

To meet these needs, Weston Solutions developed a proprietary data management tool ShaleFast™, which incorporated GIS technology and a data validation module to help track and deliver data relevant to specific locales, while managing communication records, appointments, results packages and project tracking.

PERMITTING/RESOURCE PROCUREMENT



A water test in action for a client to obtain permitting to use it in hydraulic fracturing activities.

Weston Solutions' extensive regulatory expertise offered a client in the Marcellus Shale important plans which allowed them to obtain the permits they needed to source local water resources for hydro-fracking. By preparing the necessary permit applications, supporting negotiations with regulatory authorities regarding cultural resources, endangered species, habitat protection and water intake design, and completing water modeling exercises to create a water holding and metering design with cost estimate, Weston was able to locate areas that their client could use to source groundwater to support their hydraulic fracturing needs.

CONSTRUCTION SOLUTIONS



A water storage facility development in Colorado.

When specialized construction is necessary due to environmental or geographical concerns, Weston Solutions has the resources to deliver. For a client in Colorado, Weston was challenged to share their expertise for the engineering and construction of a water storage facility in a particularly sensitive area near the mountains. Despite the challenging regulatory environment and permitting necessary, Weston found a solution to satisfy project stakeholders and provided construction management services to ensure resource development proceeded in a technically-sound and compliant manner.

WASTE MANAGEMENT



A design for a temporary waste impoundment in Alaska.

For a client in Alaska, Weston Solutions needed to come up with a temporary waste impoundment to save significant capital on frequent waste removal. The solution was found by creating two 200-cubic-yard impoundments using alternative technologies that were a fraction of the cost of traditional materials, while still meeting environmental regulations. Weston Solutions' involvement included all steps of the process, from design, permitting and procurement, to subcontractor selection, construction oversight, regulatory reporting and decommissioning.

DECOMMISSIONING



Decommissioning a non-operating facility in Mosquito Bay, LA.

Decommissioning a job site is no simple task, but for off-shore drilling, it provides additional challenges. For a client in Louisiana, Weston Solutions safely managed all of the planning, permitting, operation oversight, reporting, site clearance verification, equipment removal, material removal and disposal, and backfill to


remove a non-productive oil and gas facility. This project was completed on time and on budget with no safety incidents.

With such a varied and diverse range of projects in the oil and gas industry, Weston Solutions is able to help provide sustainable solutions no matter what phase a project is in. Kevin Axe, North Dakota Environmental and Regulatory Team Lead for Weston Solutions, says their company values their membership with the North Dakota Association of Oil & Gas Producing Counties because of the knowledgebase and forward-thinking nature of the association.

"We are very excited to be a part of the North Dakota Association of Oil & Gas

Producing Counties," says Axe. "No one does a better job than the NDAOGPC of providing a forum where we can learn more about the issues that are facing our community. And that is the first step to helping solve them—which is what we do best. In fact, it's what we've been doing for over 55 years," he continues.

"We specialize in partnering with oil and gas industry leaders—many of whom are NDAOGPC members—to help them overcome any challenges they might encounter within the areas of environmental protection, regulatory compliance, engineering, construction and community support."



Don's Directory


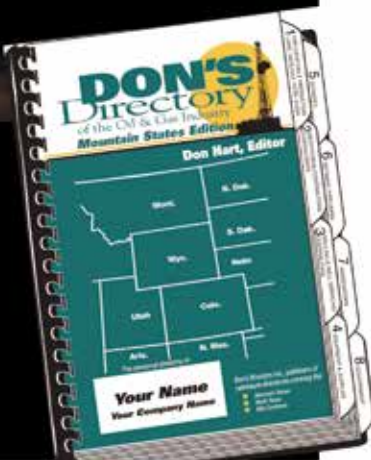
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NDAOGPC News

REGIONAL ROUNDUP

NEW 5 PER CENT OIL TAX COUNTY DISTRIBUTION BILL, HB 1358

HB 1358 makes key adjustments to the oil and gas gross production tax, allocating an increased amount of money to oil and gas producing counties, cities, hub cities, school districts, hub city school districts, oil and gas townships, oil and gas EMS service providers, and oil and gas fire protection districts. The bill also makes a crucial appropriation to oil and gas county roads. In terms of the funding model increase, Rep. Bob Skarphol says that they are for helping fund the “reconstruction of the destruction” of our communities in the oil patch.

In describing the bill, Skarphol says political subdivisions that previously received funding under the gross production tax distribution formula have utilized their funding responsibly, using the funds received in lieu of property taxes for building up and enhancing infrastructure for the long-term. He states that oil and gas tax revenue received by political subdivisions should be received under a formula-based model so that counties, cities, school districts and townships can budget more effectively for projects and ongoing operating expenses.

Additionally, the bill provides appropriations for non-oil and gas producing county road projects, as well as non-oil and gas EMS service providers across the state. An appropriation of \$585,000 is also made in the bill, providing funds to the Upper Great Plains Transportation Institute for enhanced road substructure testing and analysis of road quality and lifespan. This, according to Skarphol, gives a resource to the state in determining future county and township road needs throughout the state.

Several key pieces of testimony were offered in support of HB 1358 by western North Dakota officials, including NDAOGPC President Dan Brosz, Mountrail County Commissioner Dave Hynek, Williston City Mayor Ward Koeser, Minot City Mayor Curt Zimelman, Dickinson City Administrator Shawn Kessel, Watford City Mayor Brent Sanford, McKenzie County PSD Superintendent Steve Holen, Williams County Commissioner Dan Kalil, and township officer Troy Coons from Mountrail County.

Others offering support for the bill included ND Petroleum Council President Ron Ness, a representative of Hess Corp., ND EMS Association President Curt Halmrast, Minot PSD Superintendent Mark Vollmer, ND Association of Counties President Roger Chinn, and Shane Goettle, who offered testimony on behalf of Bakken Housing Partners, a development group seeking more state commitment in funding community infrastructure expansion.

LANDOWNER RIGHTS IN OIL AND GAS LEASING

A recent webinar presentation by Nate Bouray, Ebeltoft, Sickler, Kolling, Grosz, and Bouray, PLLC; and Daryl Dukart, Dunn County Landowners Association & Dunn County Commissioner discussed landowner rights in oil and gas leasing. The following are summarized points from their presentation:

- When approached with a lease offer, there is no need to quickly sign papers. The landowner should research what acreage you have mineral rights, talk to neighbors, do research and consult an attorney to educate you and negotiate on your behalf.
- While leasing is common, landowners can participate as a partner in well costs and profits. The third option—doing nothing—entitles you to a share in net profits but subjects you to a 50 per cent risk penalty.
- Lease length is three to five years (with landowner preferring a shorter period). The term is extended if the operator begins drilling. Royalty payments, based on the gross value of production, range from 12.75 per cent to a norm of 16.7 per cent in outer counties, to 18.75 per cent or higher in core Bakken counties. Bonus payments range from about \$4-10,000 on the Bakken. Dukart advises not to compete with neighbors but to negotiate for equal terms. Bonuses increase with acreage size, oil price, or if you are last in an area to sign.
- Other terms—Pugh clauses, continuous drilling and warranty title—are reviewed by attorney Bouray. Top leases are new contracts that extend the terms of the original lease.
- Landowners have powerful rights to negotiate terms that meet the long-term needs of their family and community. Surface-right holders or split estates still have rights to negotiate well sites and right-of-way easements.
- For joint negotiation of leases, there are only two associations on the Bakken; roughly two-thirds of the Dunn County Association's 84 members are surface right owners.

The Project Electronic Library slide presentations (www.energizingentrepreneurs.adobeconnect.com/p998p8qcj2r) contain more detailed information.

Source: www.visionwestnd.com/documents/Briefing7.pdf



SAVE THE DATE!

The NDAOGPC 2013 Annual Meeting date has been set for Thursday, September 26, 2013 in Dickinson, ND. Be sure to mark your calendars for another exciting meeting lined with speakers, information, and networking opportunities! For more details on hotel arrangements, go to www.ndenergy.org or call the association office at (701) 751-3597.

EMERGENCY RESPONSE IN WESTERN NORTH DAKOTA

The volunteer emergency response units typical of western North Dakota are no stranger to the impacts being felt due to oil and gas development in the region. Emergency call volumes around the Bakken have risen substantially in the last few years, adding particular strain to the responders who volunteer their time to aiding those in need of emergency care.

The North Dakota Association of Oil & Gas Producing Counties (NDAOGPC) has taken steps to improve emergency services in the western portion of the state. The Executive Committee of the NDAOGPC recently hired Ulteig Engineers, Inc., to conduct a study on a regional emergency services efficiency plan that will identify emergency service coverage (or lack thereof) in the 19 county regions of western North Dakota. The \$56,904 contract was executed in December 2012. The NDAOGPC will use revenues from the Uniform County Truck Permit program to pay for the study; the program assesses permit fees mainly for overweight or over-width non-divisible loads in western North Dakota, including drilling rigs, tanks and heavy equipment.

The study will gather information on response time throughout the region as it relates to the critical response time for both fire and emergency medical services. Ulteig will be working with the association, local emergency managers and the North Dakota Department of Emergency Services to gather data on responder origins, responder travel time in urban/rural settings, road network data (accounting for impacts to travel speeds in western North Dakota due to oil development), and any other relevant data that may provide additional insight.

After the analysis of emergency service coverage is complete, data will help to establish ways in which coverage might be improved. This could include establishing new locations for full-time EMTs as the region changes. It may also indicate a need for full-time EMT/paramedic personnel to be on staff in particular coverage areas. The study will gather data for potential recommendations to be made to state legislators and other key state stakeholders.



ND GREAT PLAINS AND EMPOWER ND ENERGY EXPO SHARES ON INFRASTRUCTURE NEED

According to the International Energy Agency, the United States is expected to be energy self sufficient by the year 2050. By 2030, the United States will be an energy exporter and our country will be the largest oil producer by 2020. These facts and others were shared at the 6th Annual Great Plains & EmPower ND Energy Expo held this past November at Bismarck State College's National Energy Center of Excellence.

North Dakota's United States Sen. John Hoeven spoke on infrastructure investment needs, the need for smart regulation of the energy industry, and how adding value to the region's energy resources will serve to bring the United States even closer to energy independence. Energy independence, he says, is both a national security issue and an economic stability issue. North Dakota Governor Jack Dalrymple reiterated Hoeven's enthusiasm for paving the way toward energy independence and gave an update on how North Dakota is working toward that goal. In September 2012, North Dakota's oil production reached 728,000 barrels of oil per day. Coal, he says, remains a big part of energy production, being responsible for 45 per cent of electricity production in the country. Dalrymple says that natural gas production in the state is also prime for advancement, but is facing barriers because current pipeline capacity can't keep up with the pace of drilling.

Infrastructure of the state's oil and gas producing region was a main theme at the expo. Keynote speaker, Statoil senior vice-president Torstein Hole, says his company recently passed 50,000 barrels per day in oil production. Statoil, based in Norway, holds about 375,000 mineral acres in the Bakken. Several similarities between the oil plays in Norway and North Dakota exist, Hole says. Norwegian offshore drilling has long had to co-exist with the country's pre-existing fishing industry, much as North Dakota's oil activity has with agriculture.

Also discussing infrastructure issues were ND Commerce Commissioner Al Anderson, ND DOT Director Francis Ziegler, Housing Finance Agency Director Mike Anderson, ND Pipeline Authority Director Justin Kringstad, and ND Transmission Authority Director Sandi Tabor, who formed a panel and shared on study findings and updates within their agencies.

LEGISLATURE TODAY RADIO SHOW

The NDAOGPC will be featured Monday nights on *The Legislature Today* radio show at 8:00 p.m. CST. *The Legislature Today* airs live on KFYZ-AM 550 in Bismarck, ND. Tune in for great information and discussion throughout the legislative session as western North Dakota oil county, city, and school officials discuss Bakken oil impacts and pending legislation in the North Dakota Legislature with legislators and Dale Wetzel.



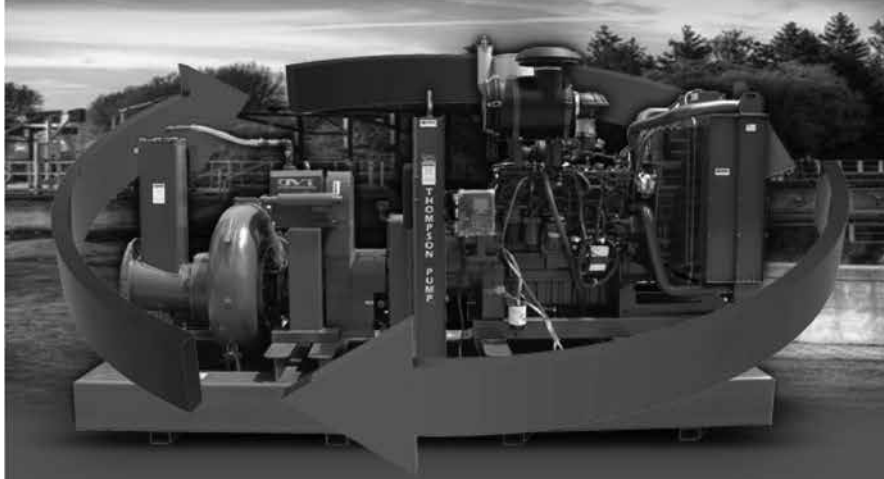
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Make sure to attend one of the year's greatest barbecues at the North Dakota Petroleum Council's CookFest! Mark down these dates and join the fun! CookFest barbecues will take place July 16 in Power Lake, ND and July 18 in Parshall, ND.





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WHAT IF MORE ENERGY RESOURCES WERE DEVELOPED?

By the Roosevelt-Custer Regional Council for Development

With all of the oil activity going on in western North Dakota, it's easy to forget about the potential development for other energy resources in southwest North Dakota: oil, natural gas, uranium, wind power, geothermal, ethanol, coal and carbon sequestration.

Compared to other sectors, oil and gas development are taking the biggest toll on southwestern North Dakota. Communities which are flexible and prepared to respond to energy development may benefit greatly, but those unwilling or unable to address the eminent changes may, indeed, experience grave impacts.

In a recent study, Roosevelt-Custer Regional Council attempted to review the nature of these individual resources and the resultant impacts that could conceivably come about if all or many were developed at the same time.

The pressures and expectations placed on local communities and counties are overwhelming and many are ill-prepared to meet these growing challenges. However, compared to the 1980s, there is a more dynamic realization from state, local and industrial interests to address those problems early in the game rather than have the liabilities and debts become unmanageable.

OIL AND GAS CONTRIBUTES \$30.4B, 60,000 JOBS TO ND

By the North Dakota Petroleum Council

The oil and gas industry contributed more than \$30.4B to North Dakota's economy and created nearly 60,000 direct and indirect jobs for the state in 2011, according to a study conducted by North Dakota State University's (NDSU's) Department of Agribusiness and Applied Economics. The study, funded by the North Dakota Petroleum Council (NDPC), demonstrates that the oil and gas industry is an important driver of North Dakota's economy, job creation, state and local government revenue and personal income growth.

"According to a separate study conducted last year, 89 per cent of North Dakotans state-wide continue to favor oil and gas development in the state, and this economic impact data shows why," says NDPC President Ron Ness. "The benefits are broad-based and state-wide. Our booming agriculture and oil and gas industries are stimulating our rural economies and job growth in a way that few of us could have anticipated even five years ago."

"Since our first impact study of economic impacts in 2005, we have seen the petroleum industry emerge as an important new engine of economic diversity and growth for the state, both in terms of direct impacts seen in western North Dakota and in secondary impacts felt state-wide," says Dean Bangsund, NDSU research scientist and co-author of the study. "North Dakota has an enormous potential for economic stability in its economy that can come from the continued development of oil resources in the state."

Among the study's key findings:

- **The oil and gas industry generated \$30.4B for North Dakota's Economy** – In 2011 alone, direct impacts of the oil and gas industry were \$11.7B and secondary impacts were \$18.7B for a total of \$30.4B in business activity. For every dollar spent in the state by the oil and gas industry, another \$1.59 in additional business activity was generated.
- **The oil and gas industry created nearly 60,000 jobs state-wide** – The study reveals that the oil and gas industry's economic importance to the state includes direct employment for 40,856 full-time jobs and secondary employment of 18,700 full-time equivalent jobs. Direct employment accounts for nine per cent of our state's workforce.
- **The industry contributed \$11.6B in economy-wide personal income** – The



study reveals that the oil and gas industry contributed \$11.6B in economy-wide personal income, including \$798.1M in in-state private royalties and \$322M in lease bonuses.

- **The oil and gas industry generated \$2.65B in government revenues** – According to the study, the oil and gas industry generated a total of \$2.65B in government revenues, including:
 - » \$1.3B in gross production and severance taxes;
 - » \$303M in royalties, including \$145.4M in state royalties, \$40.6M in federal royalties returned to North Dakota, and \$117M in tribal royalties;
 - » \$106M in state and federal lease bonuses;
 - » \$454M in sales and use, corporate and personal income, property and other taxes;
 - » \$86.5M in licenses, permits and fees;
 - » \$8.5M in charitable donations;
 - » \$395M in indirect state government general tax collections.

- **The oil and gas industry supports non-industry business activity** – The oil and gas industry benefited other industries and sectors state-wide and contributed \$7.4B in state-wide retail sales.

The NDPC has commissioned the study each biennium since 2006, and economic benefits have risen dramatically. Economic impacts have more than doubled since 2009 and grew 511 per cent (excluding infrastructure spending) since the first study in 2005. State and local government revenues grew by more than \$2.3B—or 600 per cent—since 2005, while industry-wide direct employment grew by 709 per cent from 5,051 in 2005 to 40,856 in 2011.

The study surveyed firms engaged in exploration and development, extraction and production, transportation, and processing of crude oil and natural gas. Data that was measured in this study but not included in previous surveys was an assessment of capital expenditures for infrastructure projects. A fact sheet summarizing the study's findings and the study in its entirety can be found at www.ndoil.org.

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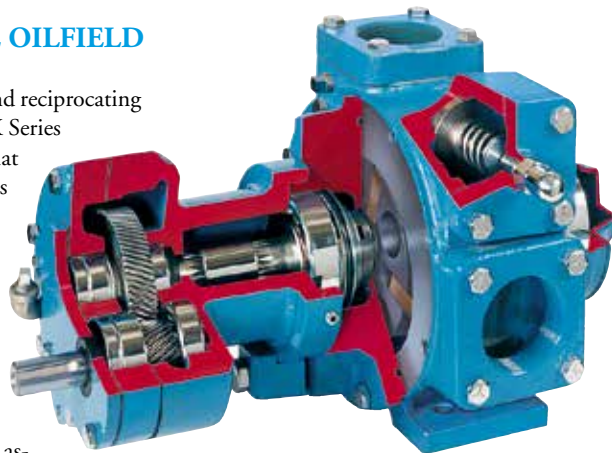
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Both models are constructed of cast iron and operate via Blackmer's unique sliding vane pumping principle that allows the pump to self-adjust for wear to maintain desired flow rates, while simultaneously offering excellent self-priming and dry-run capabilities.

The pumps also feature specialized mechanical seal and ball-bearing construction for maximum reliability and a symmetrical bearing-support system that assures even loading and longer wear life. The pump's external ball-bearing construction isolates them from the pumpage in order to minimize any contamination risks. An adjustable relief protects against excessive pumping pressures, while the pump's vanes can be easily replaced without needing to remove the pump from the piping system.

The GX Series pump offers an integral head-mounted gear-reduction drive with oil-lubricated and hardened helical gears. The pump's gear shafts are supported at both ends by ball bearings for smooth operation and long life while a splined reducer and pump shaft with dowel-mounted reducer case enables simplified pump and reducer alignment. The reducer can be rotated on the pump head to accommodate a variety of motor sizes without the need for shimming. Both the X and GX Series pumps are available in four port sizes: 2-, 2.5-, 3- and 4-inch.

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DIALIGHT'S 8W SAFESITE® RTO LED AREA LIGHT DELIVERS 100 LUMENS PER WATT FOR HAZARDOUS LOCATIONS

Dialight (LSE: DIA.L), the innovative global leader in LED lighting technology, recently introduced its new ultra-energy efficient 100 lumens per watt SafeSite® RTO LED Area Light. Consuming just eight Watts, the new RTO Area Light is the most energy efficient product of its kind and the only one certified for use in Class I Div 2 environments, as well as Class II Div1 and Class II Div 2 (Groups D, E, F) applications.

With its 12-48V DC input capability, the RTO Area Light is ideal for solar and other low-power needs, including battery-backup operation, unmanned off-shore oil platforms and other hazardous location applications. The RTO Area Light models are also available for 100-277V AC use. The fixture is also UL 844/1598, UL50/E and IP66 certified for wet-locations.

Designed as a complete fixture retrofit for up to 75W conventional incandescent or compact fluorescent jellyjar fixtures, both the area lights are L70 rated for >100,000 hours at 25°C and backed by Dialight's five-year full-performance warranty to virtually eliminate lighting maintenance for continuous, reliable use. The fixture's instant-on capability allows the lights to be switched off when not needed, eliminating the energy wasted from keeping conventional lights burning 24/7 to avoid the restrike delay.

"The RTO Area Light fixture offers the outstanding long-life reliability and performance our customers have come to expect, with a low-wattage unit that cuts both energy and maintenance costs," says Roy Burton, Dialight's Group Chief Executive.

Factory sealed inside a ruggedized housing for superior durability and weather resistance, the Downlight is suitable for both interior and exterior use, even in the most extreme environments with a broad operating temperature range of -40°F to +133°F.

The SafeSite Area Light is compatible with a wide range of mounting options, including pendant mount with or without junction box and ceiling mount with or without junction box. Flush-mount and junction box wall mounting accessory kits are also available.

www.dialight.com

NEW WORK GLOVES MADE WITH 3M™ GRIPPING MATERIAL TAKE HOLD IN MOST SITUATIONS

3M recently announced the introduction of work gloves made with 3M™ Gripping Material that deliver greater productivity and performance with less effort. Work gloves made with 3M™ Gripping Material can provide up to a 270 per cent improvement in friction when used as a two-part system and are ideal for anyone—from construction and industrial workers, to weekend warriors—who need a better grip especially in wet or oily conditions.

Comprised of thousands of micro fingers, the 3M™ Gripping Material, which is incorporated into the work gloves, enhances traction and hold on many tools and pieces of equipment. This means reduced slippage, fewer dropped tools and improved productivity with less fatigue. The work gloves can be used alone, or as a two-part system, which mates the gloves with tools or piece of equipment wrapped with 3M™ Gripping Material tape. The two-part system significantly improves friction over traditional leather gloves and wraps. The work gloves are resistant to abrasion and punctures so they stand up to the demands of the factory and in the field.

“Not being able to properly grip tools because of wet or oily conditions can be frustrating,” says Tanya Richert, global marketing development manager for 3M’s Industrial Adhesives and Tapes Division. “Whether you are handling a jackhammer, hand-tightening an oil filter in your garage, shifting levers in a plant or cutting tree limbs in your backyard, grip performance is always a concern. Work gloves made with 3M™ Gripping Material bring science and better grip performance to any job by allowing the users the ability to grip lighter, not tighter.”

In a 3M-sponsored study, researchers at the University of Wisconsin found that using 3M™ Gripping Material under dry conditions reduced required grip force by an average of 24 per cent. Using 3M™ Gripping Material for twisting tasks, oil-saturated surfaces reduced the average grip force needed by 56 per cent.

www.3M.com/gripping



NEPTUNE™ SOLAR D™ SERIES CHEMICAL INJECTION PUMP DELIVERS

Neptune™ Chemical Pump Co., a leading manufacturer of chemical metering pumps, recently announced its new Solar D™ Series Chemical Injection Pump. The Solar D pump was developed as part of a joint engineering effort with Ferguson Beauregard, a sister company of Neptune’s within the Dover Corporation.

The Solar D is an innovative solar-powered chemical injection pump that can be used to feed a wide variety of production chemicals into remote oil and gas wells where electrical power is often unavailable. The benefits of the Solar D’s method of operation are maximum chemical containment, precise and consistent chemical-injection rates at pressures up to 1,200 psi (83 bar), and reduced field service and downtime. The accurate dosing rates (from 0 to 45 gallons per day) translate into increased production with a corresponding reduction in chemical expenses.

Featuring a unique seal-less diaphragm technology that eliminates chemical leaks while offering a wide range of chemical compatibility, the Solar D’s intelligent controls give the operator maximum visibility into the system and real-time monitoring of the well site, which leads to a decrease in costly on-site service time.

The unit is equipped with a highly efficient and accurate brushless motor; standard corrosion-resistant 316 stainless steel and PTFE chemical ends; hydraulically balanced diaphragm designed for reduced wear; and no dynamic seals for reduced leak points.

www.neptunel.com



TALKIN’ TOOLS

Do you have an exciting new tool that will change the oil and gas industry in North Dakota? If so, we want to hear from you! Send press releases and accompanying photos to awalld@matrixgroupinc.net with “Basin Bits” in the subject line for consideration and possible use in a future edition of the publication. All tools are subject to approval and press releases will be edited for spelling, grammar, etc.

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TRIVIA TIME

Last year, the amount of crude oil and petroleum products delivered by rail increased 46 per cent over 2011, or almost 171,000 carloads, according to the Association of American Railroads (AAR), which tracks movement of commodities by rail. Crude oil accounted for an estimated 38 per cent of combined deliveries in the oil and petroleum products category during 2012, up from 3 per cent in 2009. The trade group says crude oil was responsible for nearly all growth last year in carloadings in this category.


Source: United States Energy Information Administration, www.eia.gov

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The Bakken Top 20

The following are the top 20 oil and gas operators in North Dakota as of March 2013. The list, which shows the cumulative amount of oil that the top 20 companies in North Dakota have produced up to the present time and going back to the discovery of oil in North Dakota more than 60 years ago, was provided by www.dakotapr.com.

As of March 2013, there are 187 rigs actively drilling in the North Dakota oil patch, according to the North Dakota Oil and Gas Division, a division of the North Dakota Department of Mineral Resources. North Dakota is currently sitting as number two in oil production in the nation, and will continue to strive for that number one position as the boom continues in the Bakken.

1. **Hess Corporation**
Production to date: 327,465,899 bbls
Tel: (713) 496-4000
Web: www.hess.com
2. **Whiting Oil and Gas Corporation**
Production to date: 173,796,212 bbls
Tel: (303) 837-1661
Fax: (303) 861-4023
Web: www.whiting.com
3. **Denbury Onshore, LLC**
Production to date: 140,381,459 bbls
Tel: (701) 575-8188
4. **Continental Resources, Inc.**
Production to date: 130,205,244 bbls
Tel: (405) 234-9000
Toll-Free: (800) 256-8955
Killdeer: (701) 764-6582
Rhame: (701) 279-6688
5. **Petro-Hunt, LLC**
Production to date: 123,800,580 bbls
Tel: (214) 880-8400
New Town: (701) 675-2467
Killdeer: (701) 863-6622
McGregor (Tioga): (701) 546-4601
Web: www.petro-hunt.com
6. **Burlington Resources Oil & Gas Co., LP**
Production to date: 113,970,838 bbls
Tel: (432) 688-6800
Web: www.br-inc.com
7. **Amerada Hess Corporation**
Production to date: 112,393,684 bbls
Tel: (713) 496-4000
Web: www.hess.com
8. **EOG Resources, Inc.**
Production to date: 76,871,597 bbls
Tel: (713) 651-7000
Toll Free: (877) 363-3647 (EOGR)
Web: www.eogresources.com
9. **SM Energy Co.**
Production to date: 75,180,729 bbls
Tel: (406) 245-6248
Web: www.sm-energy.com
10. **Enduro Operating, LLC**
Production to date: 57,738,630 bbls
Tel: (817) 744-8200
11. **Sequel Energy, LLC**
Production to date: 45,051,477 bbls
Tel: (303) 468-2106
Web: www.sequenergy.com
12. **Citation Oil & Gas Corporation**
Production to date: 33,792,002 bbls
Tel: (281) 891-1000
Web: www.cogc.com
13. **XTO Energy Inc.**
Production to date: 30,837,723 bbls
Tel: (817) 870-2800
Toll-Free: (800) 299-2800
Fax: (817) 870-1671
Web: www.xtoenergy.com
14. **Marathon Oil Co.**
Production to date: 30,409,533 bbls
Tel: (713) 629-6600
Web: www.marathonoil.com

15. **Texaco Exploration & Production Inc.**
Production to date: 29,172,952 bbls
Tel: (800) 962-1223
Web: www.texaco.com

16. **Slawson Exploration Co. Inc.**
Production to date: 25,953,934 bbls
Tel: (316) 263-3201
Fax: (316) 268-0702
Web: www.slawsoncompanies.com/exploration.html

17. **Murex Petroleum Corporation**
Production to date: 25,860,050 bbls
Tel: (281) 590-3313
Fax: (281) 590-3381
Web: www.murexpetroleum.com

18. **Brigham Oil & Gas, LP**
Production to date: 23,269,391 bbls
Tel: (512) 427-3300
Fax: (512) 427-3400
Web: www.bexp3d.com

19. **Encore Energy Partners Operating, LLC**
Production to date: 22,377,313 bbls
Tel: (307) 754-7300
Web: www.encoreenp.com; www.vnrlc.com

20. **Williston Hunter ND, LLC**
Production to date: 19,375,707 bbls
Tel: (469) 293-2168
Web: www.magnumhunter.com



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- Ninety-five percent of North Dakota's oil is produced via horizontal drilling and hydraulic fracturing. The Bakken Shale has single-handedly pushed the state up the ranks of the oil producers.
- Last year, North Dakota passed both Alaska and California on its way to second place, and though it is still far behind Texas, its growth has been incredible in such a short period of time, though there are concerns about the decline rates of Bakken wells.
- The EIA estimates that production averaged about 770,000 barrels per day (including lease condensate) by the end of 2012.
- The top producers in the state are Continental Resources and Hess.
- Together, the top oil-producing states (Oklahoma, Alaska, California, North Dakota and Texas) produce more than 60 per cent of all of America's oil.

Source: www.fool.com/investing/general/2013/03/19/the-top-5-oil-producing-states.aspx

			
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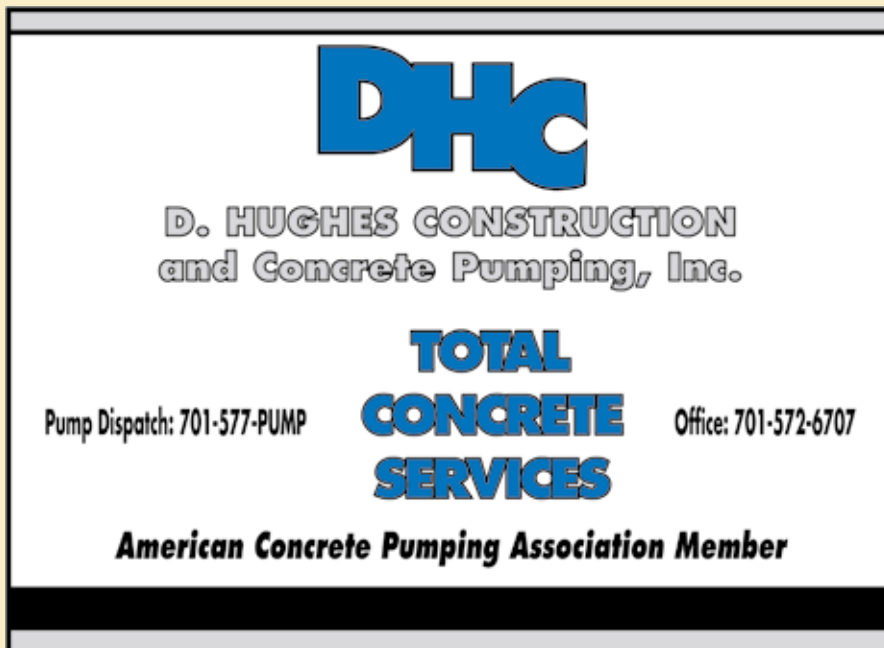
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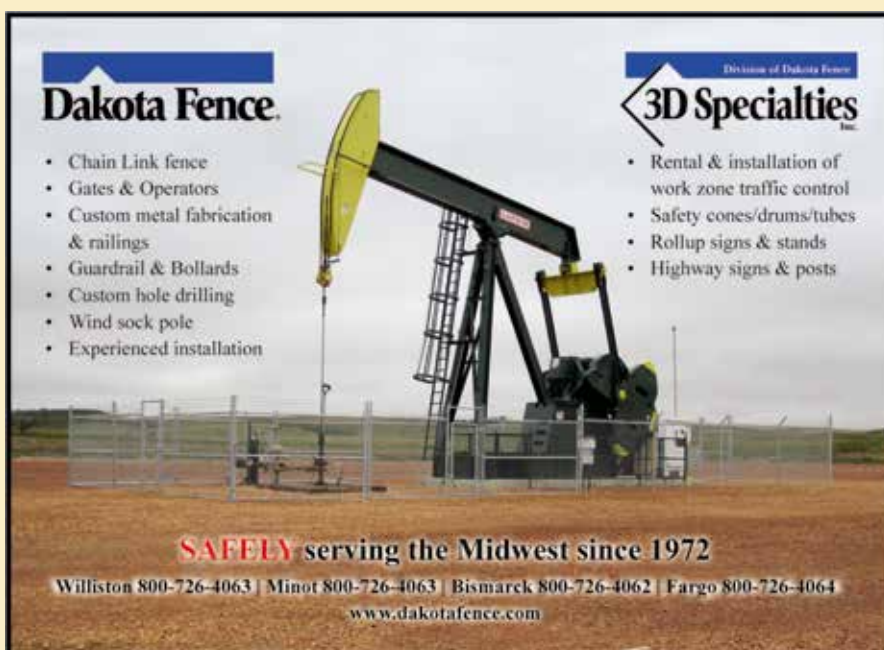
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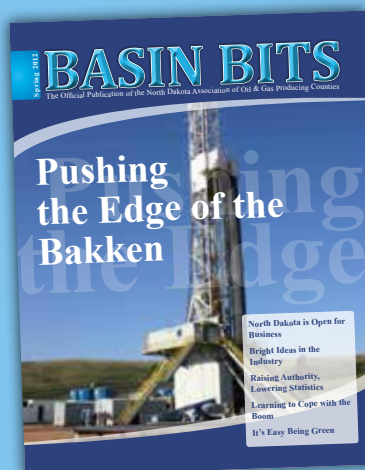
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In the Fall 2012 issue of *Basin Bits*, we ran a comprehensive list of the crew camps available in the Bakken at that time. The number of camps in your county may have changed since the printing of the publication, so for up-to-date information for your area, please contact your county auditor. There has been an update in the information available for Black Gold Williston Lodge:

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new jobs

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