

Spring 2015

BASIN BITS

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

Changing the Game: Exporting North Dakotan Crude Oil Across the Pond... *Is it Possible?*

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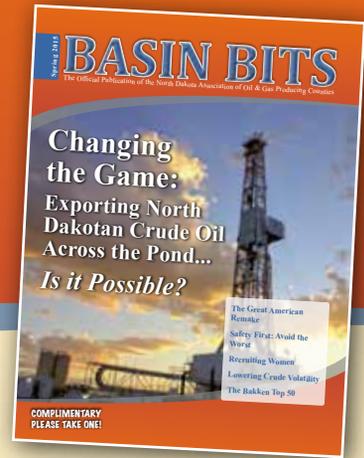
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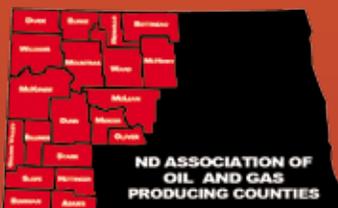
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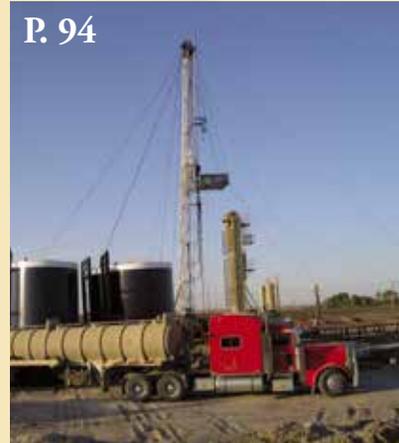
It's just another great perk of following the North Dakota Association of Oil & Gas Producing Counties.



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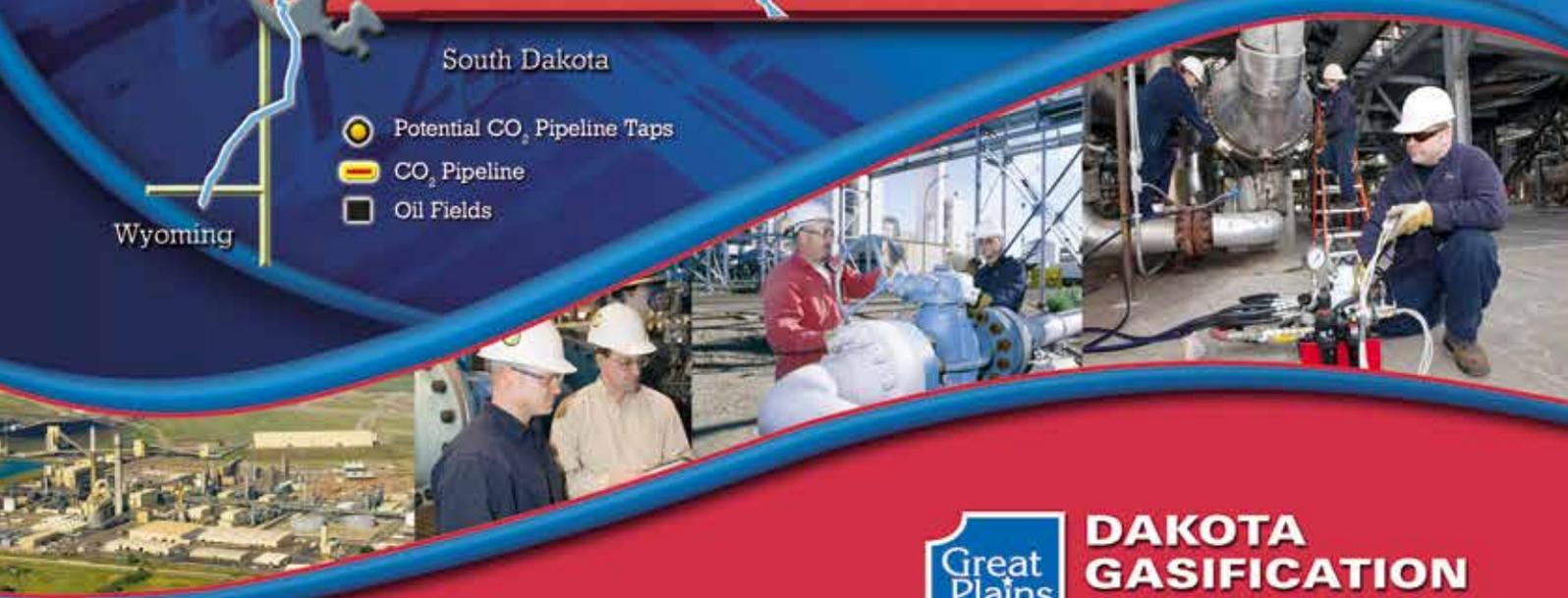
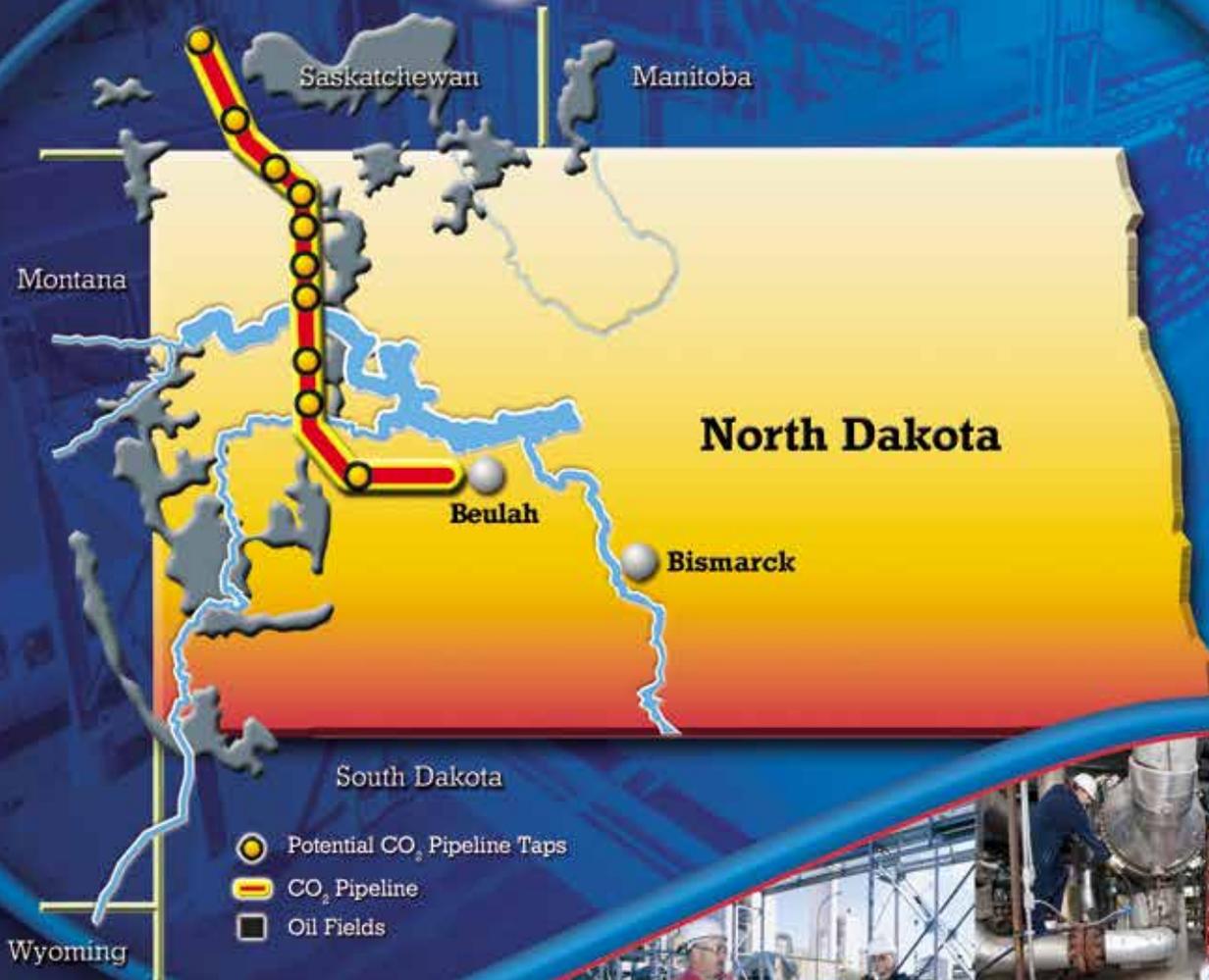
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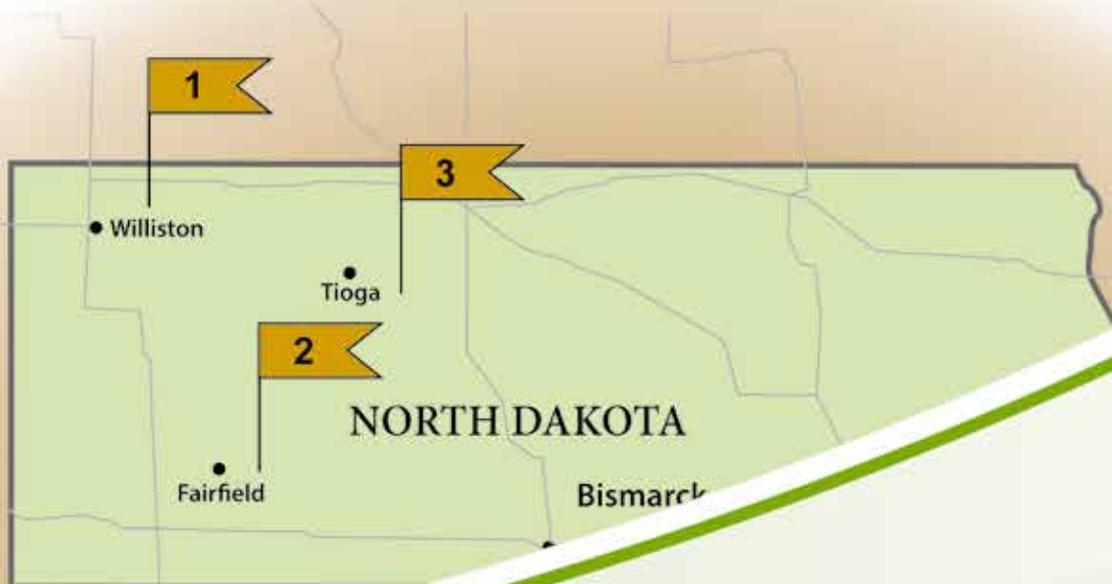
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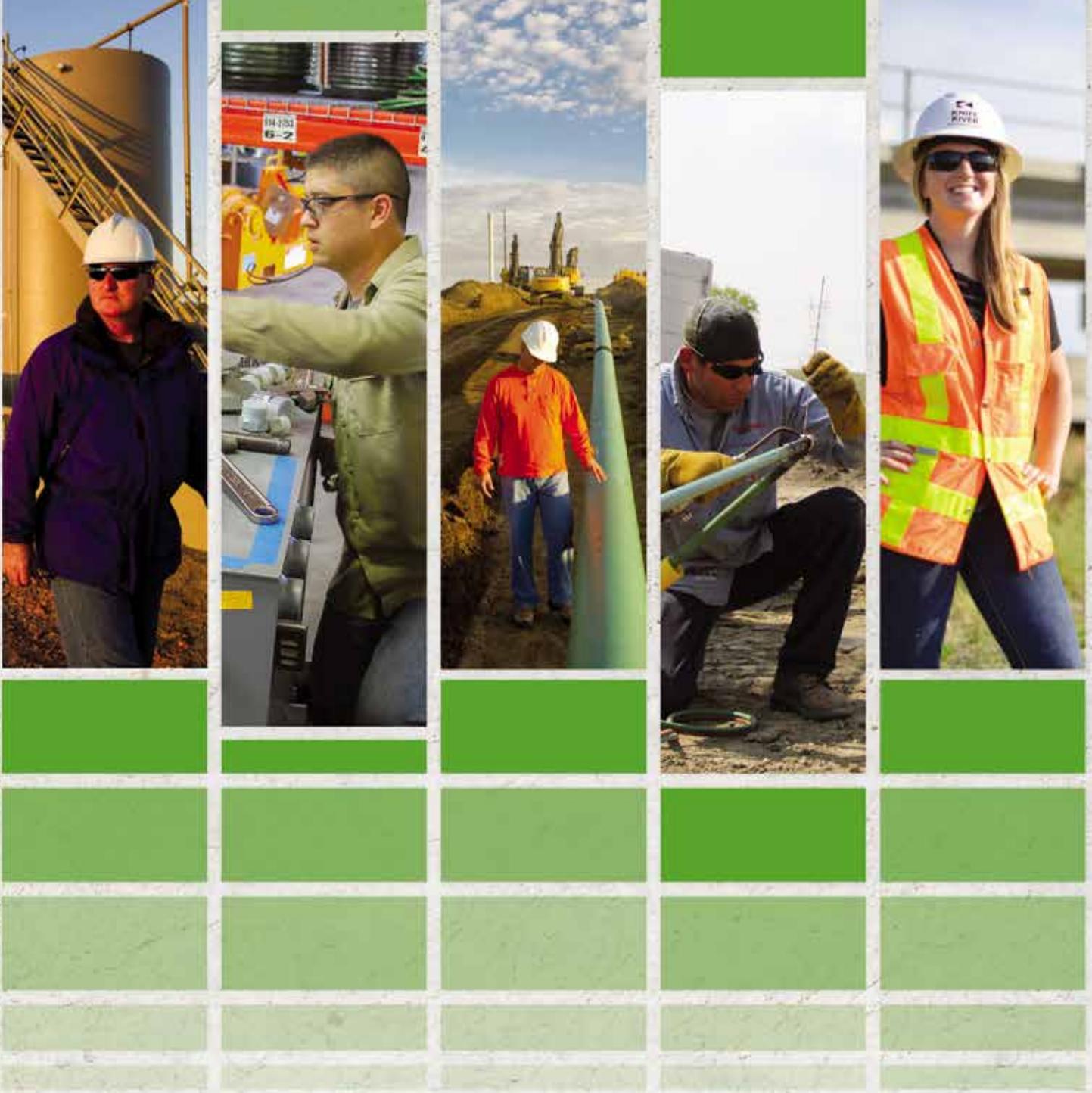
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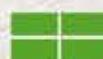




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From the Desk of the North Dakota Association of Oil & Gas Producing Counties' President



Supt. Steve Holen
President
North Dakota Association of
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Oil exploration in the Bakken and Three Forks formations has often been likened to a baseball game, and we are supposed to be at the top of the second inning; it appears we may have entered into, what we hope is, a short rain delay.

If there is one thing we have learned to do well in the heart of the Bakken over the past several years, it is to deal with change, which usually occurs at an extremely rapid pace.

Whether it is the rapid growth that has besieged us, transforming rural areas into bustling metropolitan areas, or the recent drop in oil prices that sent a chill of concern throughout the state and to those leading the expansion of infrastructure, there is a sense of resiliency required when working in an oil and gas region—when the major product is a commodity dependent on a market price.

While the oil price fall brings a ringing reality to the fluctuations that are part of oil production history, it doesn't change the prospect and importance of the role the Williston Basin plays in the future of energy for our country and in the global oil market.

Oil exploration in the Bakken and Three Forks formations has often been likened to a baseball game, and we are supposed to be at

the top of the second inning; it appears we may have entered into, what we hope is, a short rain delay. We know the full game will resume soon, and the challenges and opportunities offered in the Basin will continue and eventually be stronger than ever.

The North Dakota Association of Oil & Gas Producing Counties (NDAOGPC) has been working diligently. In 2014, the association researched and gathered information from the various political subdivisions on how to best address the vast infrastructure needs throughout the region, how to further assist and promote our communities, and how to solve the quality of life issues for citizens.

The association invested in a comprehensive study last spring that outlined the planning needs of communities that are greatly impacted by oil development, the associated infrastructure needs and the debt capacity, in order to meet—and exceed—those needs over the next several years.

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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 NDAOGPC.

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The association, along with Vision West ND, gathered extensive information to accurately articulate the needs and the challenges cities, counties, school districts and townships face in meeting those needs, with constraints of debt capacities and adequate revenue sources.

The NDAOGPC accepted the importance of having strong data to support any legislative requests, and has worked diligently to ensure the data available for the 2015 legislative session was as accurate as possible and reflected the actual needs of the Williston Basin and beyond.

The association and its members reached out to legislators, the governor's office and other statewide leaders last summer to provide information and offer the opportunity to visit our region to see, first-hand, the impacts on and challenges for communities within the Williston Basin.

The collaborative effort ensured a sense of transparency involving the planning and opportunities present for the communities to meet current and forthcoming workforce demands, as the oil play continues to develop and evolve. Those efforts outlined a direct, collaborative approach to solving the issues at-hand and protecting the great asset—economic opportunities resulting from the Bakken play—available to the entire state of North Dakota. The work done by western North Dakota legislators, drafting and communicating the needs of our communities, was tremendous and greatly appreciated by the NDAOGPC and all of its members.

From the research gathered and work that was completed in 2014, it was apparent there are two distinct types of needs for our oil-impacted political subdivisions: immediate financial assistance to allow necessary projects to be bid on, for construction to begin this spring; and an ongoing financial capacity to allow the bonding and repayment of debt that will come from services over the next several years or decades.

The first component led to what is referred to as the "Surge Bill" (SB 2103), which would quickly allow funds to flow to the counties, cities, schools and townships, and to ensure the 2015 construction season and its important projects were not missed, due to a lack of funding. The emergency clause of the bill allowed the lengthy process of bidding to begin early this winter and maximized a short construction season in North Dakota.

The SB 2103 was signed into law this February, making \$1.1 billion in state funding immediately available for infrastructure projects and other critical needs primarily in western North Dakota. The funding package



includes \$972 million for Oil Country and another \$128 million for counties and townships outside of the state's oil-production region.

Senate Bill 2103 includes \$450 million for state highway improvement projects throughout the oil and gas region. It also includes the following:

- \$240 million for the state's top 10 oil-producing counties;
- \$172 million for the cities of Williston, Watford City, Dickinson and Minot;
- \$112 million for counties outside of the state's oil production region;
- \$100 million for other cities within the top 10 oil-producing counties;
- \$16 million for townships outside of the state's oil production region; and
- \$10 million for cities within eligible counties bordering the Oil Patch.

The surge of funds provides optimism for catching up with communities' needs and gives hope to addressing current and future needs, rather than being years behind on projects that are needed today.

House Bill 1176, known as the Formula Bill, addressed the Gross Production Tax formula used to bring taxes paid by the oil industry back to the local political subdivisions in which the oil was produced.

The current formula provided a share of 25 percent of production (beyond \$5 million) back to the local area; these funds are generated from five percent of the total 11.5 percent paid by the industry, in lieu of property tax. In reality, what this formula actually provided back to local areas was about eight to 10 percent of the total revenue for those producing the highest volume of oil.

HB 1176 looked to change the formula to 60 percent of that portion above \$5 million, bringing 25 percent of the total taxes back to local areas, or one dollar out of every

four dollars going to areas supporting the oil production with infrastructure and workforce. The previous legislation was put into law with a sunset clause, with the formula change only being effective until 2015. This provision created issues with local government selling bonds because it was seen as a temporary source of revenue in paying back the new indebtedness.

HB 1176 removed the sunset provision, making sure local agencies can best use the tax revenue to service long-term debt for major infrastructure projects. The bill also carried language to support school districts using the tax revenue for school construction projects, therefore not losing 75 percent of their state foundation aid payment due to this revenue.

Schools view this revenue as a portion of its tax base and support the voter-approved construction projects passed to support the necessary workforce of the oil industry. The nature of the tax revenue and the cost of construction in our areas outline why this use of funds should not be considered an equity issue regarding funding of North Dakota public schools.

These two pieces of legislation are critical for the counties, cities, school districts and townships and ensure an economically-friendly environment in North Dakota, providing the infrastructure and quality of life required to support the vast employment needs of the industry, today and tomorrow.

It was very important to see the Surge Bill passed, providing a needed resurgence of funds to allow the local government to address the needs in western North Dakota. I am hopeful for a successful passage of HB 1176, to bring more revenue back to local subdivisions through the gross production tax formula, allowing long-term planning and financing to occur for vital infrastructure projects. Optimism and resiliency still remain strong, here in the Bakken!



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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

Holiday language comes up during the legislative session... If you hear, "It's a Santa Claus bill," that means the obvious: money for everyone in the state.

Words of the House. We use them every day; toss them around and never think much about them. If you sat through the endless hours of voting in the North Dakota House chamber, you would hear certain phrases repeated.

"IF IT WALKS LIKE A DUCK AND SOUNDS LIKE A DUCK, IT LIKELY IS A DUCK."

This phrase is used when we change old definitions in a legislative bill. For example, a nicotine cartridge in a new product line, an e-cigarette, derived from a chemical lab but built to replace a cigarette, is it a tobacco product? What if the nicotine in the cartridge came from a tobacco leaf?

If it is defined as tobacco, it could be taxed as such. If it's defined as an e-cigarette product but not tobacco, it is taxed at a different rate. So, word definitions move money from one pocket to another.

"THIS IS AN OLD FRIEND."

This means the bill has been voted down in previous sessions. Someone brings it back and it is time to vote it down again. It seems a strange way to treat a friend, but that's how the saying goes.

Another example would be electronic bingo cards or electronic paddle wheels. If the machines look like slot machines and act like slot machines, but they are called bingo, are they really bingo? The North Dakota Attorney General asked us to define it, so he could



enforce the law. Slot machines are illegal in our state. Regular card bingo is legal. An opponent to the expansion of gaming said, "If it walks like a duck..." The bingo cards were eventually approved because they must have walked like a goose.

"THERE IS ROOM FOR EVERYBODY IN THE CHOIR."

One of my graduate professors from the University of North Dakota, when we
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discussed two sides to an issue, used to say, **“There is room for everybody in the choir.”** I thought he was talking about my opinions but my other younger classmates thought he was talking about them, so it was open for interpretation. And since that class, I use the saying myself and still don’t know exactly what it means. But I like it.

“I NEED A FIX. IT’S TIME FOR RETAIL SHOPPING THERAPY.”

The other day, my daughter this. I immediately joined in. Although, later that month, I bought \$600 worth of snow tires for our used Buick, and that didn’t provide any rush of satisfaction. Not all shopping is equal.

“THE DEVIL IS IN THE DETAILS.”

Oftentimes during the session, dignitaries will come to the chambers to give a speech. One of the speakers we had in February was Jacky Arness, Miss North Dakota from Minot, ND. As she was introduced by the Speaker of the House, he announced that she was pursuing a double major—one in political science and one in religious studies.

A veteran legislator muttered to himself, **“She must be conflicted.”** We all had a slight chuckle at that; we open every day on the House floor with a prayer, however, **“the devil is in the details,”** so to speak, as we fight for funding our projects.

“THE BIG DANCE.”

Back on the House floor, a western legislator pleaded with House members to keep his bill alive for **“the big dance.”** He meant to keep it alive because he believed it was the **“fair”** thing to do—if the oil forecast is positive, and appropriators **“find money,”** the Senate can send the bill back. The House can then add money to make it work. If it doesn’t make it to **“the big dance”** at the end of the session, so be it, he added. The House defeated his bill by four votes. Western legislators didn’t feel like dancing because we had supported that bill.

“GET A ‘CHRISTMAS TREE’ ON THE BILL.”

Holiday language comes up during the legislative session. **“Get a ‘Christmas tree’ on the bill.”** Once a bill has been printed as a **“Christmas tree,”** it has a mixture of black words, green words and red words. Black words are existing law. Green text shows the original words of the bill and red words represent amendments or additional changes.

If you hear, **“It’s a Santa Claus bill,”** that means the obvious: money for everyone in the state. And it’s not a compliment to a bill in the House chamber that prides itself on frugality.

In fact, when the \$1.1 billion Surge funding passed, it was common to hear, **“Well, you got your Splurge.”** Deep breaths; count to 10.

Another common phrase that is overheard with the Finance and Taxation Committee, **“Here’s another tool for the toolbox.”** The toolbox was overflowing—and not overflowing with tools by the end of the committee’s work.

“YOU NEVER KNOW ABOUT SLEEPY HOLLOW.”

One day in committee, we were debating about putting an amendment on a bill to **“fix”** it, even though the committee would likely put a **“Do Not Pass”** recommendation on it. Why waste time **“fixing it,”** when the bill would be **“killed”** on the floor?

One of the experienced committee members said, **“Well, we should fix it, just in case. ‘You never know about Sleepy Hollow.’”** He was referring to the fact that one cannot predict a floor vote.

The words **“shall”** and **“may consider”** are two very different phrases in a bill. The House has an unwritten rule—or, maybe it is written somewhere—that legislators should not mandate Legislative Management to take up a study during the interim legislative session that they might not want to study.

Heaven forbid you tell them what to do.

Every so often, a bill comes to the floor of the House, and a leader will rise and say, **“I cannot vote for this bill because I can’t support ‘shall’ study.”** However, you might see that same person support a mandatory study bill if their name is on the bill. Don’t expect consistency.

“HARSH APPROACH”

Sometimes I am guilty of asking **“pointed”** questions in my committee hearings. I may go straight to the point. One of my fellow legislators, who sat next to me, said he has had more success with using a sweeter tone of voice, smiling, taking a deep breath, rather than taking a **“harsh approach,”** as he put it. He would hear my tone and whisper **“softer, softer.”**

One day in committee, another legislator asked a **“harsh”** question of a lobbyist, and I asked my colleague **“Why don’t you tell him he’s harsh?”** He said **“You are such a challenge; I can’t take on anyone else.”** I have to admit, I’m not a very good student. Teeth out of the jugular, **“Excuse me. I will rephrase my question. Thank you, Mr. Chairman.”**

“NEIGHBORLINESS, KINDNESS AND GENEROSITY.”

I mentioned the speech earlier given by Miss North Dakota Jacky Arness. I thought it was a great speech given by an obviously talented

young lady. She said North Dakota has a **“general culture of neighborliness, kindness and generosity,”** which shaped her into the young adult she has become.

“I have never known any other way to treat people than to listen to them and learn need, strive for excellence and care deeply about the condition of others...I think most people who come to our great state would say something similar. They came for the opportunity but they stayed because of the thing that truly sets North Dakota above the rest—the people.”

Later, she rhetorically asked the legislators, **“What state do you live in?”** As legislators, we live in a state of **“right now,”** as we negotiate the rocky road to consensus.

She is right about the politeness. I have a few unbreakable rules, and one of them is be a good person. This includes never honking at cars just because they sit at the light until I need a haircut. That’s impolite. And, it’s likely someone who lives on my street; a person I would have to face for the next 30 years.

“WORDS ARE NOT SIMPLY WORDS.”

Some sayings in the House come up every session and I love to hear them. It’s like a note from an old friend. It makes you feel warm inside. Every session, or at least the last three sessions that I have participated in, I have heard, **“Whiskey’s for drinking, water’s for fightin’.”**

And then, there is the story of the old guy who heard about North Dakota’s length of session, which runs every second year for 80 days. He asked if it was possible for legislators to meet once every 80 years for two days.

There are also, **“Trust but verify,”**; **“This is a good bill, vote green,”**; and **“This is a bad bill, let’s kill it.”** And, of course, the old standby, **“Folks, there’s not as much money as everybody thinks there is.”**

Or, when a Senator stops by the House to visit and he is accosted for a Senate vote, he scampers out of the House saying, **“I am going to get out of here before I get contaminated.”** That’s what happens when Senators only have to convince 46 others; in the House, we have to convince 93 others. It toughens us.

“Words are not simple words.” They evoke emotion. They bring tears to our eyes. They paint a story and sooth our souls. They change our views. So, I vow not to throw them around carelessly. I will choose my words, and they will be polite.

As Dr. Hasnat Khan declares his love for Princess Diana through a note in the movie, *Diana*, by using a quote from the mystical poet Rumi, **“Somewhere between right and wrong, there is a garden. I will meet you there.”** 

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TRIVIA TIME

SEN. HEITKAMP IN FAVOUR OF COAL

Sen. Heidi Heitkamp recently spoke in favour of coal. "Because it's such a big part of everyday life in the United States and is playing an increasingly larger role globally, I have been committed to finding a viable path forward for coal-fired power—as we all should be," she wrote.

Sen. Heitkamp predicts coal will make up at least one-third of the world's energy mix for decades. She introduced the *Advanced Clean Coal Technology Investment in Our Nation Act* to protect the future of coal. The act would make lowering carbon pollution affordable for coal-fired power plants.

"As a part of an all-of-the-above energy strategy, making smart investments in coal—as well as oil, natural gas, wind, and biofuels—will bring us closer and closer to North American energy independence," she wrote.

Source: www.globalccsinstitute.com/insights/authors/Senator%20HeidiHeitkamp/2014/10/22/keeping-coal-our-energy-mix-insight-us-senator-heidi-heitkamp?author=NjQ4Njg%3D

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THE 23RD ANNUAL WILLISTON BASIN PETROLEUM CONFERENCE TENTATIVE AGENDA

MONDAY APRIL 27, 2015		
10:00 a.m.	Exhibitor Move-In/Set-Up	Credit Union Eventplex, Evraz Place
TUESDAY APRIL 28, 2015		
Credit Union Eventplex, Evraz Place		Subsurface Geological Laboratory, 201 Dewdney Avenue East, Regina
8:00 a.m. to 5:00 p.m.: Exhibitor Registration / Pick-Up	8:00 a.m. to 1:00 p.m.: Core Workshop 1 & Lunch <i>NOTE: Pre-registration is required (\$150CAD/person)</i>	
12:00 p.m. to 9:00 p.m.: Conference Registration	12:00 p.m. to 1:00 p.m.: Lunch	
1:00 p.m. to 5:00 p.m.: Supply Chain Forum (Exhibit Hall Auditorium)	12:00 p.m. to 5:00 p.m.: Core Workshop 2 & Lunch <i>NOTE: Pre-registration is required (\$150CAD/person)</i>	
1:00 p.m. to 6:00 p.m.: Poster Presentation Set-Up (Exhibit Hall)		
6:00 p.m. to 10:00 p.m.: Ice Breaker (Exhibit Hall) <i>Shuttle buses will run from 6:00 p.m. to 10:15 p.m.</i>		
WEDNESDAY APRIL 29, 2015		
7:00 a.m. to 8:00 a.m.: Speakers' & Sponsors' Breakfast (Ballroom, Queensbury Convention Centre)		
7:30 a.m. to 8:30 a.m.: Continental Breakfast for delegates (Exhibit Hall, Credit Union Eventplex)		
8:00 a.m. to 5:00 p.m.: Conference Registration (Credit Union Eventplex)		
7:30 a.m. to 6:00 p.m.: Commercial & Poster Displays (Exhibit Hall, Credit Union Eventplex)		
4:40 p.m. to 8:00 p.m.: Evening Social (Exhibit Hall, Credit Union Eventplex) <i>Shuttle buses will run from 6:00 p.m. to 9:00 p.m.</i>		
8:30 a.m. to 11:40 a.m.: Wednesday A.M. Presentations: Three concurrent sessions (Main Hall, Ballroom & Exhibit Hall Auditorium)		
1:40 p.m. to 4:40 p.m.: Wednesday P.M. Presentations: Two concurrent sessions (Main Hall & Exhibit Hall Auditorium)		
Main Hall: Outlook & Updates		
8:30 a.m.	Welcoming Remarks	
8:40 a.m.	Greetings from the Province of Saskatchewan	
8:55 a.m.	Greetings from the State of North Dakota	
9:10 a.m.	Speaker TBA (North Dakota Department of Mineral Resources), <i>North Dakota Oil & Gas Industry Outlook</i>	
9:25 a.m.	Speaker TBA, <i>Montana Oil & Gas Industry Outlooks</i>	
9:40 a.m.	Keith Lowdon (Manitoba Innovation, Energy & Mines), <i>Manitoba Oil & Gas Industry Outlook</i>	
9:55 a.m. to 10:55 a.m.	Coffee Break, Visit Indoor & Outdoor Exhibits, Technical Posters	
10:35 a.m.	Melinda Yurkowski (Saskatchewan Ministry of the Economy), <i>Saskatchewan Oil & Gas Industry Outlook</i>	
10:50 a.m.	Ed Dancsok (Saskatchewan Ministry of the Economy), <i>The Implementation of IRIS at the Government of Saskatchewan & What It Means to the Oil & Gas Industry</i>	
11:10 a.m.	Speaker, Topic TBA	
11:40 a.m. to 1:40 pm.	Lunch Break, Buffet (Between Exhibit Floor & Main Hall; Seating in Main Hall)	
12:30 p.m.	Keynote Luncheon Speaker, TBA (Main Hall)	



WEDNESDAY APRIL 29, 2015

Time	Main Hall: Hydrocarbon Production & Enhancement	Ballroom: Infrastructure, Safety & Regulatory	Exhibit Hall Auditorium: Case Study
1:40 p.m.	Matthew Burton-Kelly (Energy & Environmental Research Center, UND), <i>Identifying Residual Oil Zones in the Williston & Powder River Basins Using Basin Modeling</i>	James Baker & Dave Thomson (JP Baker Management Inc. & Engineered Rail Solutions), <i>Oil by Rail...Southeast Saskatchewan & Beyond</i>	Chad Hyslop (US Ecology), <i>Radioactive Waste Transportation & Disposal</i>
2:00 p.m.	Petro Nakutny (Saskatchewan Research Council), <i>Effective EOR Technologies for Tight Oil Reservoirs</i>	David D'Alessandro (Stinson Leonard Street, LLP), <i>FERC and The Pipelines: Making Growth Work</i>	Russ Gross (Horton Inc.), <i>Fan Clutches for Cold Environments</i>
2:20 p.m.	Gökhan Coskuner (Husky Oil Operations Ltd.), <i>Enhanced Oil Recovery Potential of Lloydminster Heavy Oil Reservoirs</i>	Heidi Tillquist (Stantec Consulting Services), <i>Prioritizing Risk for Pipelines Using Geographic Information Systems</i>	Stephan Buckingham & Mike Murray (Basin Concrete and Trucking & ATEK Access Technologies), <i>Wireless Tank Monitoring in the Oilfields</i>
2:40 p.m.	Aenida Morris-Melvin (Baker Hughes), <i>Increase Oil Recovery Using Crosslinked Gels to Block Waterflood Hot Streaks</i>	Mike Vukman (Stantec Consulting Services), <i>The Importance of Geomorphic Risk Assessments Along Proposed & Existing Pipelines</i>	TBA
3:00 p.m. to 3:40 p.m.	Coffee Break, Visit Indoor & Outdoor Exhibits, Technical Posters		
3:40 p.m.	Steven Hawthorne (Energy & Environmental Research Center, UND), <i>Can We Translate High Oil Recoveries from Bakken Rocks in the Lab Using Associated Natural Gas and CO₂ to the Field?</i>	TBA	Mike Herrmann & Ken Elliott (Legacy Risk Solutions, LLC), <i>Environmental Liability Mitigation for the Bakken</i>
4:00 p.m.	James Sorensen (Energy & Environmental Research Center, UND), <i>Reservoir Characterization and Modeling to Examine the Potential for CO₂ Storage & Enhanced Oil Recovery in the Bakken Petroleum System</i>	TBA	Tom Wilson & Dan Johnson (Blue Bull LLC), <i>Effectively Eliminating H₂S in an Environmentally-Friendly Way</i>
4:20 p.m.	BK Sekar (Lightstream Resources), <i>Innovative Unconventional EOR: An Unconventional Tertiary Recovery Approach to an Unconventional Reservoir</i>	TBA	Jed Tallman (Ferus), <i>From Flare to Fuel: Using Flared Gas as Compressed Natural Gas to Fuel Operations</i>
4:40 p.m. to 6:00 p.m.	Commercial Displays & Technical Posters (Exhibit Hall, Credit Union Eventplex)		
4:40 p.m. to 8:00 p.m.	Evening Social (Exhibit Hall, Credit Union Eventplex) <i>Shuttle buses will run from 6:00 p.m. to 9:00 p.m.</i>		

THURSDAY APRIL 30, 2015

7:00 a.m. to 8:00 a.m.:	Speakers' & Sponsors' Breakfast (Ballroom, Queensbury Convention Centre)
7:30 a.m. to 8:20 a.m.:	Continental Breakfast for delegates (Exhibit Hall, Credit Union Eventplex)
8:00 a.m. to 10:00 a.m.:	Conference Registration (Credit Union Eventplex)
7:30 a.m. to 1:00 p.m.:	Commercial & Poster Displays (Exhibit Hall, Credit Union Eventplex)
8:20 a.m. to 11:20 a.m.:	Thursday Presentations: Three concurrent sessions (Main Hall, Ballroom & Exhibit Hall Auditorium)
1:00 p.m. to 12:00 a.m.:	Exhibitor Move-Out

Time	Main Hall: Exploration & Development	Ballroom: Infrastructure, Safety & Regulatory	Exhibit Hall Auditorium: Case Study
8:20 a.m.	Peter Budgell (National Energy Board), <i>An Assessment of the Unconventional Petroleum Resources in the Bakken Formation of Saskatchewan</i>	John Herrmann (TenCate Geosynthetics Americas), <i>The Use of Innovative Geosynthetics to Substantially Reduce Access Road & Well Pad Costs</i>	Rocky Mottahedeh (United Oil & Gas Consulting Ltd.), <i>A Case for Geo-Model-Based Geosteering Best Practices in Geosteering & Well Placement Case Study</i>

THURSDAY APRIL 30, 2015

Time	Main Hall: Exploration & Development	Ballroom: Infrastructure, Safety & Regulatory	Exhibit Hall Auditorium: Case Study
8:40 a.m.	Zhuoheng Chen (Geological Survey of Canada), <i>An Integrated Approach for Assessing Unconventional Petroleum Resources: A Case Study of the Devonian-Mississippian Lower Middle Bakken Member</i>	Tanya Shanoff (Stantec Consulting Services), <i>Emergency Response Case Studies: Prevention, Preparation, Response & Restoration in Action</i>	Scott Mundle (Chemistry Matters), <i>"Geo-CSI" in the Oil Patch: How Advanced Geochemistry Solves Real World Problems</i>
9:00 a.m.	Steve Nordeng (UND), <i>A Plea for a Standardized Three Forks Stratigraphy</i>	Jeffrey Voorhis (HY-BON Engineering), <i>Best Practices for Vapor Recovery Systems to Reduce Venting and Flaring</i>	Annie Smith (Profire Energy, Inc.), <i>Managing Chemicals: Why Chemical Injection Management?</i>
9:20 a.m.	Mike Blair (Crescent Point Energy), <i>Upper Shaunavon Geology Revisited: Evidence for a Mixed Carbonate-Siliciclastic Barrier Island System in the Greater Rapdan Area of Southwest Saskatchewan</i>	Scott Stewart (Halker Consulting), <i>Future-Proofing Oil & Gas Installations Against Regulatory Changes Throughout the Site Development Lifecycle</i>	Cliff Baratta (Encapso), <i>Driving Efficiency with Encapsulated Drilling Lubricants: Technology for Operational & Economic Improvements</i>
9:40 a.m. to 10:10 a.m.	Coffee Break, Visit Indoor & Outdoor Exhibits, Technical Posters		
10:10 a.m.	Phil Richards (Chemistry Matters), <i>Geo-forensic Chemical Analysis of Oil Samples from the Madison Group: What Can it Tell You?</i>	TBA	TBA
10:30 a.m.	Sven Egenhoff (Colorado State University), <i>How Anoxic Are Black Shale Settings? Views from the Upper Bakken Shale</i>	TBA	TBA
10:50 a.m.	Stephen Sonnenberg (Colorado School of Mines), <i>The Giant Continuous Oil Accumulation in the Bakken Petroleum System, Williston Basin</i>	TBA	TBA
11:20 a.m. to 12:00 p.m.	Lunch Break, Buffet (Between Exhibit Floor & Main Hall; Seating in Main Hall)		
11:45 a.m.	Keynote Luncheon Speaker Patricia M. Mohr, VP, Economics & Commodity Market Specialist, Scotiabank, Toronto, <i>Outlook for International Oil Prices, 2015-16: Implications for the Williston Basin</i> (Main Hall)		
Closing Remarks, Conference Adjourns			

*Agenda is subject to change but is up-to-date as of publication of this magazine. Please check the latest version on the WBPC website, www.wbpc.ca.



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Changing the Game:

EXPORT

By Paul Adair

The 1970s was a decade of tremendous turbulence for the United States—culturally, politically, and economically. In particular, 1973 proved to be a difficult year, as it marked the beginning of a multi-year oil crisis set off by the members of the Organization of Petroleum Exporting Countries (OPEC). The crisis was spearheaded by OPEC's Arab members, plus Egypt, Syria, and Tunisia, and it established an oil embargo in response to American involvement in the Yom Kippur War; the hope of the embargo was to push American policy into a more pro-Arab position.

Mixed with the embargo were an increasing global-demand for petroleum and a declining U.S. domestic oil production. These factors only exacerbated the 'oil-shock' felt by most of the western world, which witnessed the price of oil quadruple almost overnight, causing the price at the pumps to skyrocket with domestic supplies dwindling.

"We ended up having gas shortages here at home in the United States," says Robert Harms, owner at the Harms Group, a consulting firm that does work in the energy sector, including the oil and gas arena.

"I was a teen working at a gas station and we would run out of gasoline. This was unheard of at the time, and it was unthinkable that we could have possibly run out of gas."

TRYING TO OFFSET THE CRISIS

Nixon's administration attempted to mitigate OPEC's actions through a number of energy-saving measures, with varying levels of success, from lowering speed limits on American highways, to extending daylight-savings time, to the adoption of gas-rationing programs. It wouldn't be until the spring of 1974, however, when Americans could allow themselves to breathe easier, as OPEC once again opened its wells, as a result of easing tensions between Israel and Arab leaders.

That being said, the ramifications of OPEC's embargo are felt, even to this day, 40 years later.

While it's true that the embargo was disruptive, it had the fortuitous effect of turning a spotlight on America's growing dependence on foreign oil and the importance of the nation insulating itself from the uncertainty and volatility of world crude markets. This led President Gerald Ford to bring forth

the Energy Policy and Conservation Act (EPCA) of 1975, a comprehensive approach to federal energy policy.

The goal of the EPCA was to help buffer the nation against future oil disturbances created by any hostile foreign oil producing countries, through programs such as the Strategic Petroleum Reserve and the Energy Conservation Program for Consumer Products. Also, for better or for worse, the EPCA also called for the president to ban crude oil exports, with some limited exceptions. This ban is a national policy that remains in effect in 2015.

Exporting North Dakotan Crude Oil Across the Pond... *Is it Possible?*



...this has the United States on pace to become the largest global oil producer within the next few years, surpassing the output of both Russia and Saudi Arabia.

However, the country has changed a lot over the last 40 years, and the merits of the crude export ban now call out to be reevaluated. Studies have shown that the ban did not bring the desired outcome of foreign oil independence; instead it had the inverse effect. Only five years ago, America found itself importing over 67 percent of all oil consumed domestically from foreign sources, some of which, can now be considered questionable in relation to the best interest of the United States.

“Ultimately, the export ban distorted the market,” says Harms. “Once in a while, we get off into the weeds, thinking we can control markets without having some kind of impact or without distorting other market

forces. This ban only ended up impeding domestic investment.”

That being said, domestic oil production has increased faster during the last six to seven years than anywhere else in the world, thanks to the shale revolution, and this has the United States on pace to become the largest global oil producer within the next few years, surpassing the output of both Russia and Saudi Arabia. Coupled with this production boom, national oil consumption has steadily decreased in recent years, and it is this combination which has created a glut of oil commodity in the domestic market.

SUCCESS HAS ITS CHALLENGES

The amount of oil being produced domestically establishes a significant challenge for the nation’s refineries: what do they do with all of the oil? The refineries along the Gulf Coast, where much of the Bakken shale oil is transported, are designed to handle the heavy, lower quality oil from countries such as Saudi Arabia, Venezuela and Mexico. Because they are not primarily set up to process the lighter shale oil, they are able to place a

lower value on Bakken crude—despite its higher quality—resulting in lower prices paid to producers.

“The majority of the United States’ refinery capacity is not set up for shale oil, especially along the Gulf Coast,” says Kirk Wald at Stark Development Corporation.

“Instead, this higher quality oil needs to travel to the refineries that have been modified or built to handle lighter crude oil, in Philadelphia, Washington State or California. The Bakken oil that is required to make the journey to the Gulf Coast would then be forced to be sold at quite a discount because it is just not what those refineries are designed for. So, this ban forces producers to face the logistical issues in getting their product to less optimal markets. Oil producers in this state are unfairly hit twice, despite the fact they have a much better quality of oil.”

HOPING TO HOP THE POND

Local producers feel they would be able to garner the best price for their product overseas, where Asian and European refineries are set up for the Brent-like quality of Bakken crude and have an increasingly voracious appetite for fuel.



TRIVIA TIME

OBESITY RATES IN NORTH DAKOTA

As of 2013, North Dakota had the 14th highest adult obesity rate in the United States, at 31 percent. That is up from 23.9 percent in 2004 and 11.6 percent in 1990. The rates differ slightly between men and women, at 32.3 percent and 26.8 percent, respectively. The highest rate of age groups is 36.2 percent among people aged 45 to 64.

The state is not taking as many steps toward reducing obesity rates as some other states. North Dakota does not have competitive food standards or limits in schools. Competitive foods are those that are not part of the USDA school meals program. Nutrition content does not have to be listed on menus of large food chains in North Dakota. BMI screening or other weight-related assessments are not mandatory in schools.

In other aspects of health, North Dakota is not looking so bad. North Dakota is ranked in 37th place for its 8.9 percent rate of diabetes; that is up from less than five percent in 1990. For its 29.7 percent rate of hypertension, it is ranked in 40th place, up from about 20 percent in 1990.

Source: www.stateofobesity.org/states/nd

CRUDE OIL VOLATILITY

The North Dakota Industrial Commission (NDIC) adopted new conditioning standards to improve the safety of Bakken crude oil for transport. Order No. 25417 sets operating standards for conditioning equipment to properly separate production fluids into gas and liquid.

The order includes parameters for temperatures and pressures to ensure light hydrocarbons are removed before oil is shipped to market. The new standard requires operators to condition crude oil to a vapor pressure of no more than 13.7 pounds per square inch (psi). National standards are no more than 14.7 psi.

Initially, the NDIC was going to require crude oil be processed at temperatures as high as 120° F, but oil producers pointed out that polyethylene pipeline could melt at that temperature, voiding a manufacturer's warranty.

All Bakken crude oil produced in North Dakota will be conditioned (no exceptions). The order requires operators to separate light hydrocarbons from all oil to be transported and prohibits blending of light hydrocarbons back into oil prior to shipment. Companies that do not comply could face a penalty of up to \$12,500 for each day in violation.

The order came into effect April 1, 2015, allowing enough time for producers that want to use alternative conditioning or stabilization methods to have requested a hearing before the commission, and allowing enough time for companies to have installed the equipment needed to ensure compliance.

Source: www.nd.gov/ndic/ic-press/dmr-order25417.pdf

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GET TO KNOW OUR EXPERTS

KIRK WALD



Kirk J. Wald is a specialist in business development, with a focus on the energy sector, especially oil and gas. He also has an extensive background in financial services and is the owner of Resource Service Providers, Inc.

Wald grew up in Dickinson, ND, during the first oil “boom,” before obtaining his Bachelor’s degree in business administration from Ohio State University. After his service in the U.S. Army as an officer, Kirk returned to the private sector to focus on business development. He and his wife Laura have a daughter and two sons.

REP. KEVIN CRAMER



Kevin Cramer was elected to the U.S. House of Representatives on November 6, 2012. He serves on the House Committee on Energy and Commerce, which has the broadest jurisdiction of any committee in Congress.

Cramer has a B.A. degree from Concordia College in Moorhead, MN, a Master’s degree in Management from the University of Mary in Bismarck, ND. He was conferred the degree of Doctor of Leadership, honoris causa, by the University of Mary on May 4, 2013.

A native of Kindred, ND, Kevin and his wife Kris have three adult sons, two daughters and one granddaughter.

ROBERT HARMS



Robert W. Harms is a lawyer and consultant in Bismarck, ND and owner of The Harms Group, a government affairs firm with an emphasis on oil and gas development. Harms served as Governor’s Counsel in North Dakota from 1992 until 2003. As Governor’s Counsel, Harms helped to set and implement policy within the administration and served as one of the Governor’s senior advisors.

Harms has a Bachelor’s degree in political science from North Dakota State University and a Juris Doctorate from the University of North Dakota. He and his wife Cherie have two sons and live in Bismarck, ND.

Last summer, *the Washington Post* revealed documents leaked from American-European Union trade negotiations that called on the United States to lift its ban on crude oil exports, and, specifically, to reconsider the ban on crude shipped to Europe.

Certainly, many within the European Union (EU) would welcome an additional supplier of quality oil, as recent events in Ukraine have European leaders questioning their own oil dependence on nations such as Russia.

Former Soviet Union countries (led by Moscow) currently provide the EU with almost 40 percent of its crude oil; as such, they carry a great deal of influence with some member nations; an influence that EU member nations would be more than happy to remove.

DISTORTING THE DOMESTIC MARKET

While the case for allowing the export of crude to world markets is strong, there are detractors to the lifting of the export ban. While it is true that the nation’s oil producers would see the greatest return in having the ability to reach a greater global marketplace, refiners along the Gulf Coast benefit a great deal by having a domestic seller in place that is constrained to a single market, and they enjoy the economic benefits of purchasing oil at a discounted price which, in turn, helps the refiner’s profit margins.

“When we put this ban in place, it distorted the market for producers,” says Harms. “Domestic producers are constrained to the domestic market, and because of this, they get less value for oil that is clearly just as good as Brent crude. We have American refiners who are free to take part in the open world market and buy Brent crude, if they chose to, or settle for West Texas Intermediate. It is a remarkably good position for the refining industry to be in.”

An additional myth bandied about when defending the ban is the idea that stopping American oil from leaving the United States in some way protects American jobs and the economy. While it is true that some value-added and downstream jobs may be shed, any expected increase in investment upstream and midstream would more than make up for any lost employment numbers.

“Allowing U.S. commodities to fully participate in the world market generates new investment in America,” says Harms. “It will create new pipelines to better transport crude to the coasts and develop a more efficient distribution chain that reduces energy costs for American manufacturing. If the government really wants to help the economy to continue

...domestic oil production has increased faster during the last six to seven years than anywhere else in the world, thanks to the shale revolution...

in its recovery, then it needs to put its shoulders to the wheel and work to lift this ban.”

EXPORT-PRICE DISCONNECT

An additional force working against lifting the ban is the weight of institution that 40 years of national energy policy can bring; the ban has been in effect for so long that any momentum toward change will be difficult to enact. Policy change also often equates with political change, and, at this moment in time, the voting consumer does not really perceive the value in lifting the ban, partly because of a lack of education in explaining the benefits inherent in its removal.

“It would be difficult to show that if we remove this artificial roadblock to exporting crude that we could better meet world demand, and then prices would naturally fall because of a better supplied world market,” says Wald. “Oil companies have an

undeserved reputation of being big, wealthy and exploitative of the American public, and the American farmer, whom would see his American oil going overseas would not necessarily draw the line to lower global oil prices and lower prices at the pump.”

This export-price disconnect turns out to be unfortunate for the U.S. consumer, as recent multiple independent reports have suggested that by opening domestically produced shale oil to the world marketplace, Americans could expect to see national fuel prices drop anywhere from two to 12 cents per gallon.

But even more than just reducing the price of fuel for consumers, many feel that by lifting the venerable export ban, there is the potential for the United States to become a stabilizing entity in the world market. By opening the doors to crude trade, our nation will be better able to protect

itself from the large unpredictable price swings that saw the price of oil range from a high of approximately \$150 per barrel a couple years ago, to the roughly \$50 per barrel we see today.

“Obviously global commodities are always subject to geo-politics and are never completely stable, but I believe the United States is a far more stable player than many other suppliers are proven to be,” says Rep. Kevin Cramer of North Dakota. “Any time there is stability, there is certainty. And certainty is a much better place to be in attracting large investments and in calming peoples’ anxieties, which are in a high pitch at the moment.”

FOR BETTER OR FOR WORSE

So far, there hasn’t been much vitriolic debate concerning the ban on either side of the fence. While there are certainly people who believe the ban should be kept in place, at least for the time being, the idea of lifting the ban seems to lack the emotionally-charged verbiage that hampers progress on similar topics, such as the Keystone XL Pipeline project.

“This might be that we, as Americans, have a fairly good culture of trade and of understanding of the value of trade,” says Cramer. “The conversation surrounding the lifting of this ban hasn’t turned partisan, with the administration drawing a hard line on the issue and anyone else making it an anti-Obama issue. Because of this, the discussions up to this point have been fairly reasonable, which has been a good thing and is pleasantly surprising.”

SPREADING THE WORD

Looking ahead, education will be paramount in helping to shape perceptions on the importance of lifting the ban. It will be up to consumer groups and associations, such as the North Dakota Association of Oil & Gas Counties, to take the lead in delivering the message to the American public. Hearings, such as the House Energy Commerce Committee held late last year, also play a part in broaching the subject and helping to bring the public along with the idea of lifting the ban before a concentrated push is made.

“It is the natural tendency of elected officials to let it play out in the public arena for a little bit before the real discussion begins,” says Cramer. “If people can be convinced that the price at the pumps won’t go up, that prices might actually go down, and that jobs will be created for middle-class America, then that makes a pretty sound argument for lifting the ban and makes it a very hard thing to argue against.”

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The Great American Remake

By Jason Spiess

When the modern day shale play began nearly a decade ago, energy companies realized this extraction cycle was completely different than anything they had ever come across before. Then, the code was cracked and the starter pistol was fired. The modern day shale play essentially became the Bakken Boom, creating new business plans, strategic meetings, buyouts, mergers and other major industry-changing moves.

BUILDING ON THE BOOM

“The Bakken changes everything,” says Lynn Helms, director of the North Dakota Department of Mineral Resources. “It has changed your life and will continue to change your life.”

Helms’ words were said at the North Dakota Association of Oil & Gas Producing Counties’ annual meeting. Now, his initial words were meant for those working and living in the Bakken oilfields, but, his comments demonstrated and tied in to convey that the Bakken is truly the modern day shale play; a world-class resource.

“National and international attention is tremendously focused on what is going on here in the state of North Dakota,” says Helms. “How it is changing the global economy; how it is changing environmental outlooks around the world; how it is changing attitudes about North Dakota and all the surrounding oil and gas producing shale plays.”



Sen. John Hoeven (ND-R) speaks with Jason Spiess.



Travis Jordan, MT RIGMAT, speaking with delegates at the 22nd Williston Basin Petroleum Conference, in Bismarck, ND.

BUILDING ON THE ECONOMY

This change is seen on a whole new level when discussing the impact to the economy. Roman Gonzalez, Ph.D., is director of the Energy and Environment Initiative and a professor of chemical and biological engineering and bioengineering at Rice University in Houston, TX. He knows the Bakken is special because of the role that energy plays in the global economy.

“Energy impacts everything in the economy. In terms of innovation, [it affects] many different sectors,” says Gonzalez. “We are seeing innovation in so many sectors of the economy and we want to keep seeing it. I am very excited about it, because I feel like I am an entrepreneur more than a professor.”

Dr. Gonzalez is also program director of the Advanced Research Projects Agency – Energy (ARPA – E), with the U.S. Department of Energy. He goes on to say that in many areas of energy, the value-added projects from traditional energy products will identify companies to work together, collaborate and innovate new technologies to solve problems and percolate new micro-economies.

BUILDING ON INNOVATION

Another expert who sees energy as the fuel behind innovation is Karen Alderman Harbert, president and CEO of the U.S. Chamber of Commerce’s Institute for 21st Century Energy (Institute). She believes those who are actively seeking new technical information and applying it to traditional applications are driving our country’s economic rebound.

Harbert anecdotally validated the hypothesis that innovation and technologies are driving the shale plays across the country, impacting the economy in new and dramatic ways.

“There is no other industry out there today that is higher tech than the energy business,” says Harbert. “We think of IT as really being ET. So it is really the new high tech part of things.”

Harbert continues, illustrating how technology has changed and evolved over time, and how oil and gas have played a role.

“When you look at the change, the pace of change, and the scale of change, in terms of what the energy industry has been able to unlock, they are getting more out of it,” says Harbert. “The rocks haven’t changed. They have been here for millions of years. Our technology has advanced so quickly to get at things unbeknownst to us just a couple of years ago.”

BUILDING ON NATURAL GAS

Robert Bryce, senior fellow at Manhattan Institute for Policy Research, suggests the natural gas game is really suited more for the bigger companies, which have access to large amounts of resources, especially in the natural gas transportation area.

“When it comes to natural gas and transportation, I really don’t see a big role for backyard entrepreneurs because of the capital requirements. They are just so large,” says Bryce.

“For general or smaller backyard entrepreneurs, we are seeing an economic boom that is rippling throughout the entire economy; everybody from hotel owner, to restaurant owner, to refueling. So, there are places in these booms for all kinds of people who want to start and own their own businesses, and I think it is all of this economic activity that is really allowing and providing an opportunity for a lot of people.”

BUILDING ON ENTREPRENEURIAL SPIRIT

According to U.S. Sen. John Hoeven, these backyard entrepreneurs are popping up in North Dakota from all over the nation and are contributing to The American Remake.

“Business is the engine that drives this country and small business is the backbone of our country. North Dakota is leading the way forward,” says Sen. Hoeven.

“Whether it’s agriculture, energy, technology or any of our other healthy industries, we are working to build a business climate that

MT RIGMAT loads an order of rig mats to be shipped to the Eagle Ford in Texas.



will continue to empower our great entrepreneurs, companies and small businesses to invest and make new and exciting things happen. That’s why everyone is asking about North Dakota and what’s going on up here.”

Enter BCE Structural, the largest structural engineering firm in Montana. The company is looking at how a backyard entrepreneur can use science, resources and ingenuity to assist the oil and gas industry, when it comes to time and money. The firm released a study involving rig mats, reporting quite a spike in new load data and durability.

“Our firm helped work through solutions for walking rigs, and the 4L mat tested the best,” says Matthew Schmidt, a project and managing engineer at BCE Structural.

“Now, like every energy job, it depends on the conditions and circumstances, but the 4L is the best strength for the least amount of weight.”

This study was commissioned by MT RIGMAT, a modern day group of backyard entrepreneurs from the little town of Charlo, MT. Charlo is located between Kalispell and Missoula, in the Flathead Lake region.

“We have never seen a rig mat company go to these lengths to ensure a safe and sound product,” says Schmidt. “Studies like this really do show hard numbers and facts, so professionals can have an intelligent conversation to highlight strengths and also dispel any myths about the product.”

BUILDING ON THE GREAT AMERICAN REMAKE

MT RIGMAT emerged from the 2009 recession after the Flathead Lake area was hit hard. Travis Jordan, a certified electrician and president of MT RIGMAT, started Montana’s first rig mat company in the state, with the help of a team of certified welders.

“The 2009 recession left a glut of unemployed electricians in our area. Actually anything that dealt with building or construction was hit hard. Even the logging industry was hit pretty hard,” says Jordan. “I had to reinvent myself and my business, while keeping my faith and family values intact. I very well couldn’t ship a wired house and I saw a need for the rig mats. We had a group of certified welders and electricians hungry for work, so

Continued on page 38

Continued from page 37

we set out to build a quality product by dedicated and hard working professionals.”

Since then, MT RIGMAT has grown its little business into a real, viable asset to oilfields and the Charlo community. MT RIGMAT started small, shipping mats to North Dakota and Montana, according to Jordan. Since then, the company has grown to ship all over the United States and even into Canada and Australia, creating economic activity with the local saw mill and doubling the company’s output.

During the early days, Jordan, like many, had to solve some unforeseen problems with the ever-changing energy industry. Since the study was done, and he was able to use the data to recreate a product, Jordan says he was pleasantly surprised that some small changes to the original 4-Rail Heavy Duty mats have made them 10 times stronger than steel-framed laminated wood (CLT) mats.

“Steel is really 19 times stronger than wood,” says Schmidt. “Wood is a great product for its weight, but with today’s rigs, the combination works very nicely. Essentially, it serves as a spine or backbone and distributes the weight.”

Jordan was quick to learn which variables to focus on when applying innovation.

“In the oilfield, weight is not as much of a concern as strength. We must get as high

a strength as possible out of the product,” says Jordan. “Steel is about 20 times stronger than wood, but an all steel rig mat would be too heavy, so, we had to back that down and engineer the highest strength for the weight that we could, while working within the industry standards and needs.”

According to Schmidt, one of the biggest benefits to this whole study is the proactive reclamation practices with the rig mats.

“The basic economics of trying to bring in a road base in soupy clays, means you need to bring in a bunch of gravel. That gets expensive,” says Schmidt. “In lieu of that, you remove one of those rig mats and you are not destroying the landscape. In fact, in many cases, you are preserving native fauna roots that might be very difficult to find, if they are destroyed by gravel, rock and the wear and tear of trucks.”

In the end, the one thing that may be the most satisfying to Jordan is peace of mind. Knowing that his hard work—and his team’s hard work—is making a difference in the industry, while being validated by outside sources for their innovation.

“Getting everyone on the same page and speaking close to the same language has allowed us to remove the anecdotal data like, ‘It looks pretty soft today,’ to real data and facts that we can truly measure,” says Jordan. “We are not guessing anymore.” 

GET TO KNOW OUR EXPERTS JASON SPIESS

Jason Spiess is an award-winning journalist, talk show host, publisher and executive producer. Spiess has worked in the radio and print industry for over 25 years. For all but three years of his professional experience, Spiess was involved in the overall operations of the business as a principal partner. Spiess is a North Dakota native, Fargo North alumni and graduate of North Dakota State University.

Currently, Spiess is the chairman and executive producer of The Crude Life, a multimedia content and distribution company. On the radio, Spiess produces and hosts newsmagazine programs for 35 radio stations, including *Building the Bakken*, *The MonDak OilField Review*, *Coffee & Capitalism* and *The Texas OilField Review*.

In print, Spiess has contributed to 23 newspapers and magazines focusing on energy, technology, business and agriculture. Additionally, he is featured on Stackstreet.com, Examiner.com and podcast sites like iTunes and Podomatic.

For more information on Spiess, you can email jason@thecrudelife.com or visit www.thecrudelife.com.

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Breathing New Life into New Town

By Paul Adair

Located in Mountrail County, at the epicenter of the Bakken oil boom, the city of New Town, ND, has been witness to a great many changes in the years following the resurgence of oil production in the region; changes that have been both positive and negative for the community.

Like other cities affected by the Bakken, New Town has seen its population grow as a result of the boom. Once a small city of roughly 1,800 people, the city has expanded to over 3,000 in a span of three short years, with estimates anticipating the city to balloon to over 8,000 people within the next two decades.

New Town's position within the Fort Berthold Indian Reservation has partially buffered the city from some of the rampant development that has swept through many of the neighboring communities. This has allowed New Town to watch from the sidelines and learn from the experiences of other cities facing similar issues.

"Our engineers know what's happening in places like Williston and Watford City," says New Town Mayor Daniel Uran. "What they have gone through has helped us quite a bit in our growth and lets us think long-term in our urban planning. Maybe we are moving a little slower, but I think that's an advantage over some of the other communities in the Bakken that have developed at a tremendous rate—we've had a little more time to plan things out."

INCREASING INFRASTRUCTURE DEMAND

This ability to plan for the future is going to be put to the test as new building projects and developments continue to place a greater strain on the infrastructure that is already in place. Where New Town would average 12 building permits annually in the years preceding the boom, the city now doles out almost 120 each year, bringing with them an ever-increasing demand for infrastructure and essential services.

"We have a lot of infrastructure needs," says Uran. "When you allow development to happen, you are promising things like streets, curbs, gutters, water lines and sewer lines to be there for the developers and residents who plan on moving in there. We really have a huge challenge ahead of us."

BYPASSING CHALLENGES

Much of the progress in the city needed to wait until the completion of the New Town Truck Reliever Route in November 2014, which allowed the city to shunt the approximately 12,000 vehicles per day away from an overworked Main Street, opening a window for new projects such as the Main Street rejuvenation. The rejuvenation plans were delayed for years as a result of high traffic volumes.

"The bypass was key to increasing the infrastructure of New Town," says Uran. "Once it was completed and could divert traffic, everything could get rolling, and things started to happen."

The accessibility of affordable housing remains an issue for New Town, as a large number of workers are still coming into the city and finding themselves living in campers and trucks throughout the year.

"Now that we have the oil, it's just brought a lot more folks into the community looking for work," says Colleen Reese, District 4 county commissioner and longtime resident of New Town. "Many of these people coming here don't have anything. It is really sad, the number of people who have come into town with just five dollars to their name, looking for work, and trying to find a new place to live."

VYING FOR VACANCY

There are several housing projects currently in the works to alleviate the residential strain. Developers, such as Meridian Pacific and Oppidan, are beginning to take the lead in providing new homes for workers, and the city is in the process of completing a second brand new hotel, with an additional hotel, the Sunset Motel, adding an adjacent apartment building in its back. All of this will undoubtedly better the city's current no-vacancy rate.

There has been an increased need for emergency services, such as ambulances and firefighters, over the last few years. Ambulance calls have risen from about 300 calls per year to over 1,300, with paramedics averaging three or four requests per day. Serviced by volunteer firefighters, New Town is looking at building a new fire hall and investing in a ladder truck to better service the apartment buildings that are being built.

With the influx of outside workers and new money into New Town because of the oilfields, so has come a certain level of vice that was not evident in the community before the boom. Police services now encounter an increase in overall rowdiness and criminal activity within the city.

"I was at a meeting recently put on by the city police, showing what exactly they are finding in vehicles now when they get pulled over," says Reese. "There are a lot of guns and drugs that are being transported through the town and that is a tough pill to swallow. It's pretty hard on a small community such as ours."

BREATHING NEW LIFE INTO NEW TOWN

In spite of the strains on infrastructure and the negatives associated with heavy oil production, the arrival of the oil industry into New Town has been generally viewed as a good thing for the well-being of the community.

"The boom has been welcome news to New Town," says Uran. "All across the north-west of North Dakota, businesses were dying off in a lot of the small towns, like ours. The boom has brought in a lot of money, and a lot of good jobs for people who might have struggled for employment before, helping people get on their feet again. The oil industry has definitely breathed new life into our town and has done much more good than harm."

New Town is poised to take advantage of all the boom has to offer. With foresight, the city anticipates reaping the benefits of ever-increasing development, while retaining the small town character that defines this city at the Heart of Lake Sakakawea.

"I believe our greatest asset has always been our people," says Uran. "New Town is always going to be a place where people want to come and raise a family. We just have to have a vision for the future and plan for it."

Maybe we are moving a little slower, but I think that's an advantage over some of the other communities...we've had a little more time to plan things out.

GET TO KNOW OUR EXPERTS COLLEEN REESE

Colleen Reese has been a resident of New Town for over 30 years. For 20 of those years, Reese was a domestic violence/sexual assault advocate. She now focuses her time on her role as the county commissioner of District 4, which the city of New Town is part of. She is in her second term as commissioner.

"After years of working as a victims' advocate, it's now very interesting to find myself advocating for everybody in my county, trying to do what's best for everybody and trying to make their lives better."

DANIEL URAN



Daniel Uran was born on a family farm just north of New Town in 1953 and attended school at New Town Public School District. Uran graduated from NDSU Bottineau with an Associate's Degree in business administration and from Minot State University in 1991 with a degree in accounting.

For 10 years, Uran worked in the oilfield on drilling rigs before taking over the family farm. He has been employed at New Town Public School District since 1992 as the business manager and has also served five years on the city council. Uran has been the Mayor of New Town for five years. "I enjoy helping people and I feel that by serving as mayor, I am accomplishing just that."

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TRIVIA TIME

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HISTORY OF OIL PRICES

Annual Average of Domestic Crude Oil Prices (in \$/Barrel) Inflation Adjusted to 2014 (November)

Year	Nominal Price	Inflation Adjusted Price
1946	\$1.63	\$19.41
1950	\$2.77	\$27.19
1960	\$2.91	\$23.26
1970	\$3.39	\$20.63
1980	\$37.42	\$107.37
1990	\$23.19	\$41.79
2000	\$27.39	\$37.55
2010	\$71.21	\$77.11
2014 (November)	\$89.08	\$89.08

Source: www.inflationdata.com/Inflation/Inflation_Rate/Historical_Oil_Prices_Table.asp

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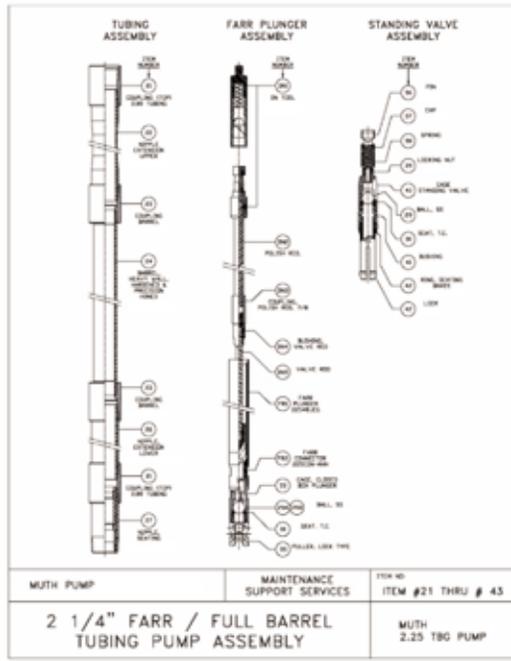


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Sandpiper Pipeline Delayed

By Danelle Cloutier

Enbridge's plan to build a pipeline to transport crude oil from North Dakota to refineries in the United States and Canada has been delayed. The company is waiting on permits from both the Minnesota Public Utilities Commission (MN PUC) and the Wisconsin Public Service Commission, and is awaiting an environmental review to study the pipeline's environmental and social impacts.

The Sandpiper Pipeline will be approximately 616 miles long and will span from the company's Beaver Lodge Station south of Tioga, ND to Clearbrook, MN, and it will be 30-inches in diameter from Clearbrook, MN to Superior, WI. Enbridge says the pipeline will be a long-term, stable and reliable source of Bakken light crude oil for North American refineries.

The Sandpiper Pipeline could potentially alleviate rail and highway traffic congestion by transporting as much oil every day as 3,628 trucks and 1,710 railcars.

WAITING GAME

The company originally planned to start construction in 2015 and have the pipeline in service by 2016, but delays in the regulatory process have pushed the date of completion to 2017.

"Any delay means the construction timeline has to shift," says Katie Haarsager, Enbridge's North Dakota community relations advisor. The delay also affects environmental research.

"A delay there means if we were to go out and do an environmental survey, that window

of opportunity starts to close the longer those delays take," she says. "We've really worked hard. We've put in 150,000 hours in the development and environmental work on this route, and we're looking forward to seeing the in-service of this project."

The project will provide about 1,500 local jobs during construction in Minnesota, with the expectation that most of the construction jobs will be filled by Minnesotans. The project is also expected to increase revenue for the local hospitality industry and other businesses that are providing equipment,

supplies and materials, and increase property tax revenue in each county the pipeline crosses. Once Sandpiper is in service, Enbridge's contributions to Minnesota property taxes will increase by as much as \$25 million annually.

Haarsager says using a pipeline to carry crude oil is a safe and efficient option. "A lot of the supporters who have come out have talked about the need to reduce rail traffic. The pipeline would help alleviate that."

Oil spills from trains are larger than those from pipelines; the average spill from a pipeline in transit is 12,259 liters, while the average spill from a train is 70,000 liters. The volume of crude oil is easier to control with pipelines, and the flow of oil is continuous. The Sandpiper Pipeline could potentially alleviate rail and highway traffic congestion by transporting as much oil every day as 3,628 trucks and 1,710 railcars. The pipeline will add 225,000 barrels of oil per day, which is equal to 700 railcars per day.

SPARKING DISCUSSION

The North Dakota Public Service Commission held public hearings about Sandpiper in February 2014, and the MN PUC held route permit information hearings along the proposed route in March 2014. The hearings addressed concerns of landowners, environmental organizations, elected and

public officials, emergency responders and, of course, the public.

In January 2015, the MN PUC conducted public hearings in St. Paul, Duluth, Bemidji, St. Cloud and Crookston to discuss the need for the Sandpiper Pipeline. During these hearings, opponents to the project said the focus should be on developing renewable energy.

RATING ROUTES

Citizen and conservation groups have protested the project, urging for alternate routes that, they say, will not be as harmful to the environment as Enbridge's preferred route. One of the groups pushing for an alternate route is the Minnesota Center for Environmental Advocacy (MCEA), a non-profit organization that uses law, science and research to protect Minnesota's natural resources, wildlife and the health of its people.

"The route they have chosen goes through lakes among the clearest in the state, as well as wild rice lakes, which are important economic and spiritual resources for our tribes," says Kathryn Hoffman, MCEA staff attorney.

"These are all resources we need to protect. The best way to protect them would be to put the pipeline in a different place."

Enbridge's preferred route promises to balance the impact on landowners and minimize the crossing of natural resources. The company

has been working with regulatory and environmental agencies, county officials, communities and landowners to develop the Sandpiper Pipeline route since early 2013 and has made more than 20 adjustments to its plan.

"Throughout the project lifecycle, we have quite a bit of consultation built into the project itself, like community meetings," says Haarsager. Enbridge also held one-on-one meetings, focus groups and meetings with organizations from North Dakota to Wisconsin, and integrated the feedback into the project.

"We definitely hold ourselves to our company values of integrity and respect," says Haarsager.

PROTECTION AND PREVENTION

More than 75 percent of Enbridge's preferred route follows pipelines and other infrastructure already in operation. The route runs through seven counties, which Enbridge has operated in for 65 years; five of the counties support the project.

The company says that 92 percent of landowners along the route have supported the project by granting easements for the construction, operation and maintenance of Sandpiper.

Enbridge spent 150,000 hours surveying the land along its proposed route to avoid sensitive areas as much as possible. The studies



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and surveys have looked at wetland and body of water delineations, biological assessments for threatened and endangered species and species of concern, and cultural resource inventories.

In places the company cannot avoid construction, reasonable impact minimization and mitigation measures will be developed and implemented. The company is also working with state regulators, such as the Minnesota Department of Natural Resources, to develop site-specific construction plans to help protect valuable resources.

The North Dakota Pipeline Company has developed an environmental protection plan for the project, which includes spill prevention, containment and control measures to minimize the risk of construction-related spills. The environmental protection plan also includes erosion control, drilling mud releases, noxious and invasive weeds and restoration/re-vegetation measures. The company will be conducting inspections during and after construction to ensure the plan is being followed.

In environmentally sensitive areas, such as waterways, Enbridge will use directional drilling to install the pipe deep below the waterway. The company will use pipes with thicker walls and extra abrasion-resistant coating to ensure the waterway's safety.

Continued on page 50

GET TO KNOW OUR EXPERTS

KATHRYN HOFFMAN



Kathryn Hoffman joined the Minnesota Center for Environmental Advocacy in December 2010 as staff attorney and works to support energy and mining issues. As a graduate of the University of Minnesota Law School, Kathryn Hoffman comes to MCEA with a background in complex litigation with the law firm of Zelle Hofmann Voelbel & Mason LLP.

In addition to her J.D., Hoffman holds a Master's in Public Policy, with a concentration in science, technology and the environment, from the Hubert H. Humphrey Institute of Public Affairs. She also serves as adjunct faculty at the University of Minnesota Law School.

KATIE HAARSAGER



Katie Haarsager is a 2011 graduate of the University of North Dakota, where she received her bachelor of arts in communications, with a minor in English and non-profit management. Haarsager has been the community relations advisor for Enbridge since June 2011.

Her role at Enbridge includes managing North Dakota region community investments, supporting public awareness initiatives and upholding relationships with Enbridge's many pipeline neighbors and communities.

She enjoys volunteering and is an active member in the Minot community, participating with such groups as the Mouse River Players Community Theatre, Minot Area Community Foundation and Minot Area Chamber of Commerce. Haarsager is a native of Mohall, ND, and is currently working on her Masters in Business Administration through the University of Mary.

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Continued from page 49

The company monitors all of its pipelines and frequently conducts routing inspections and aerial patrols of the line. In the case of an emergency, Enbridge is prepared to act quickly and thoroughly—the company has a helicopter stationed in Bemidji that can transport trained staff and necessary equipment to any of its Minnesota pipelines within minutes. The company also keeps emergency response material and equipment at locations along the proposed route.

Enbridge's goal is to work toward a neutral footprint for new projects. To fulfill this commitment, the North Dakota Pipeline Company will conserve one acre of wilderness for

every acre permanently impacted, plant a tree for every tree that has been removed to build new facilities, and generate one kilowatt-hour of renewable energy for every kilowatt-hour of energy the pipeline consumes.

NEXT STEPS

Now that the hearings are finished, the judge will consider all testimony and make recommendations to the MN PUC by April 2015. MN PUC is expected to decide whether or not to grant Sandpiper a certificate of need in June. If the MN PUC finds a need for the pipeline, it will then have to decide whether or not the pipeline should follow Enbridge's preferred route.

Enbridge says this delay impacts Minnesotans who are counting on the Sandpiper Pipeline for improved safety in crude oil transportation, relief to rail traffic and congestion, a more reliable, cost-effective crude oil supply, much-needed construction jobs and new tax revenue.

While this project is awaiting permits, this does not mean that Enbridge isn't working with landowners on right-of-way acquisition and completing the environmental survey work through the permitting process. Stay up-to-date on the project by visiting www.minnesotaprojects.enbridge.com.



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Safety First: Avoid the Worst

By Simon Peacock



When it comes to working in the oilfields of North Dakota, not many outsiders consider how important safety truly is. Safe operations affect every aspect of the oil and gas industry, from the operators and their co-workers who lay the pipe, all the way to the suppliers, shareholders and consumers. When an accident occurs on a job site, it can take months before things can get up and running again, not to mention setting back the company by millions of dollars in clean-up costs and legal fees.

The oil and gas industry goes to great lengths to continuously monitor for leaks and spills, using tools such as smart pigs, aerial surveillance and digital data loggers to constantly monitor any changes in pressure.



This is where quality control and pipeline inspection play a vital role when it comes to safety in the oilfields. Even with all the technological advances in inspection equipment, the most effective way accidents are avoided is by ensuring the operators are properly trained and working in safe conditions.

SAFETY IS EVERYONE'S RESPONSIBILITY

Workplace safety is the top priority for all employers in North Dakota's oil industry. The Department of Labor's Occupational Safety and Health Administration (OSHA) works tirelessly inspecting the oilfields of North

Dakota, making sure all pipeline operators are educated and working in safe conditions.

Eric Brooks, Bismarck Area Director for the OSHA, says nearly 10 years ago, the organization did merely 10-15 inspections per year in North Dakota's oil fields, but in recent years those numbers have risen exponentially.

"Since around 2010, inspections in the oilfield comprise nearly one-third of our total workload and nearly 50 percent of the fatality investigations we perform," says Brooks. "It is critical that employers develop, implement and enforce the industry-developed guidelines established to ensure worker safety."

Even when given the proper training and education, it is still important for an employee to take ownership for their own well-being and the safety of those around them. Being responsible enough to speak up when working conditions are unsafe can save you and your co-workers from fatal accidents.

"It is very important for everyone—owners, supervisors and employees—to embrace their responsibility toward workplace safety," says Brooks. "No one should lose their life or suffer life-altering injuries because safety came after profitability. After nearly every incident, we are flooded with calls reporting that 'They knew this; I thought it was bad; I knew better,' yet no one spoke up. With poor safety, it is not a matter of if, but rather a question of when something catastrophic will happen."

Ensuring all pipeline inspectors and operators are experienced and educated goes a long way toward improving workplace safety.

INSPECTION AND DETECTION

Chad Pittsley has been working in quality control, DOT Compliance, and Pipeline Inspection for 15 years. He now owns his own inspection company, D3 Inspection, which strives to provide inspectors who are highly trained, competent, and experienced in all phases of pipeline and facility construction. This includes being up-to-date on all equipment and technology used to inspect the pipe before it is buried.

One of the most common practices D3 Inspection performs during quality control tests is holiday detection.

"Steel pipe arrives with a factory coating applied to it, and to protect each weld, a coating is installed on each weld in the field," says Pittsley. "Early failure in the coating will occur if there is a discontinuity—a holiday or jeep, as it is commonly called—such as a pinhole, void, crack, thin spot, foreign inclusion, or contaminant in the coating. Many of these defects are not readily visible, but can be located using holiday detection equipment. Holiday detectors are instruments that use electricity to locate coating discontinuities. All holidays are removed



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and a protective coating is reapplied to that area before pipe is lowered into the trench.” Once the pipe has cleared inspection, been welded and coated, it is ready to be lowered into the trench and covered. A protective layer of soft material free of rocks must be surrounding the pipe before the trench can be filled in.

“There must be a minimum of 12 inches of padding on the bottom and around the pipe and another 24 inches of padding on top of the pipe before soil material can be used to complete the backfill,” says Pittsley. The trench is then carefully backfilled, to ensure the pipe and its coating is not damaged.

“Care is taken to protect the pipe and coating from sharp rocks or abrasion as the backfill is returned to the trench, says Pittsley. “In areas where the ground is rocky and coarse, the backfill material is screened to remove rock and the pipe is covered with a rock shield material to protect it from abrasions.”

The oil and gas industry goes to great lengths to continuously monitor for leaks and spills, using tools such as smart pigs, aerial surveillance and digital data loggers to constantly monitor any changes in pressure. In the construction aspect of preventing spills in the years to come, it is all dependent on how the lines were originally installed. This is where having your employees properly trained really comes into practice.

“There are companies that take pride in their work and do everything in their power to install it correctly and to specification, and then there are the companies that are here to get the pipe in the ground fast and fail to think of the future integrity of the pipeline,” says Pittsley. “This is where it is so important to have reputable contractors and inspectors who realize the importance

that what they do today can actually affect many people 10 to 20 years from now.” The future of this industry is already seeing advancements in technology, as permits and paperwork are being streamlined with the help of Smartphones. But there will always be a need for highly trained individuals to visually ensure pipelines are installed safely, with integrity and according to industry standards. 

GET TO KNOW OUR EXPERTS CHAD PITTSLEY



Chad Pittsley has worked on quality control and inspecting pipe in the Bakken, since the boom in 2011. He moved to North Dakota from Nevada with his wife and three boys and now runs his own inspection company, D3 Inspection. Pittsley wants his company to embody job security and personal growth for employees. He aims to attract, develop and retain the best employees who ensure any project they work on meets the industry standard safety guidelines.

ERIC BROOKS

Eric Brooks has been with the OSHA for approximately 15 years. Since November 2012, he has served as the Area Director for the Bismarck office, covering the Dakotas. During his tenure, Brooks has been involved in a wide variety of safety- and health-related issues, through enforcement inspections, education and outreach seminars and emergency response actions.

Brooks is originally from the eastern seaboard, where he provided health and safety expertise to several counties and municipalities in Virginia. He has completed a master's degree in the field of environmental management from Hardin-Simmons University in Abilene, TX, and he currently resides in Bismarck, ND.



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Clean Coal Cleans Up: Success Stories from the Industry

By Paul Adair

Coal has been used in this country to generate power for more than 140 years and, today, stands as the single greatest source of domestically-produced energy in the United States, supplying approximately 40 percent of the nation's electricity needs. Unfortunately, the use of the nation's coal resources also adds to the nation's energy-related carbon dioxide emissions totals, annually accounting for over 80 percent of all greenhouse gas emissions throughout the U.S. and pumping almost six million metric tonnes of carbon into the atmosphere each year.

In a world where human-attributed climate change is moving from a place of plausible skepticism to one of scientific fact, coal's carbon footprint can no longer be ignored. The question, then, becomes, "What can we do about it?"

At the National Conference of State Legislatures in December 2014, two massive North American projects were singled out by the U.S. Department of Energy as bright success stories in adopting state-of-the-art carbon capture and storage (CCS) technologies: Mississippi's Kemper Project and Saskatchewan's Boundary Dam CCS project.

KEMPER COUNTY ENERGY FACILITY

Southern Company subsidiary Mississippi Power is constructing the Kemper County energy facility, a 582-megawatt,



SaskPower's Boundary Dam (BD3) Carbon Capture and Storage project.

21st century coal generation plant near the town of DeKalb, MS. The facility will use a new, first-of-its-kind Integrated Gasification Combined Cycle (IGCC) technology to convert locally mined, low-grade coal (lignite) into a synthesis gas to generate electricity for its customers.

"The use of this innovative technology is expected to capture 65 percent of the carbon dioxide emissions," says Jeannice Hall, a representative at Southern Company.

"Customers will reap the benefits of the low-cost fuel source the first day it begins generating electricity from lignite, and once the project is in operation, the sale of captured carbon dioxide and other marketable projects from the coal gasification process are expected to generate at least \$50 million annually."

Eastern Mississippi was selected as the project site for its ideal geology and geography. Mississippi has an estimated four billion

mineable tons of “young coal” lignite, which is high in moisture and accounts for over half of the world’s coal reserves. The facility is being constructed next to a lignite mine with more than enough ore to meet the needs of the project for its entire life. By positioning the generation plant close to the mine, transportation costs were kept at a minimum and a nearby CO₂ pipeline allows for the repurposing of captured carbon for enhanced oil recovery practices.

In the wake of 2005’s Hurricane Katrina, Mississippi Power realized the need to have a generating facility located away from the Mississippi coastline, in an area not subject to hurricane flood risks. Nearly 200 miles north of the coast, DeKalb, MS was the ideal location for the Kemper Project.

Workers at the site are now focusing on the start-up phase of the project and on one of the plant’s more significant milestones to date—the first fire of the gasifier. The combined cycle has been operating on natural gas since August 2014, as part of the start-up process, and following the firing of the gasifier this spring, Southern Company expects to bring the remainder of the project into service in the first half of 2016.

Southern Company views the research and development that goes into the Kemper Project as a way to provide meaningful solutions for the future of both domestic and international energy markets. As such, the company, in partnership with KBR, developed the Transport Integrated Gasification (TRIG™) technology used at the Kemper Project and is marketing it around the world, where there is abundant low-grade coal and the need for marketable captured carbon.

“As energy innovators, Southern Company and Mississippi Power are committed to the long-term success of the Kemper project to provide stable energy prices for customers,” says Halls. “The investment in a first-of-its-kind technology, like that being deployed at Kemper, is evidence of our belief that America’s most abundant fuel source, coal, must continue to be a component of the full portfolio of energy resources.”

BOUNDARY DAM (BD3) CCS PROJECT

Further north, across the 49th parallel into Canada, SaskPower’s Boundary Dam (BD3) Carbon Capture and Storage project has been garnering international praise for its advances in CCS technologies and was recently recognized as this year’s “Project of the Year” in the coal category by *Power Engineering* and *Renewable Energy World* magazines.

BD3 commenced construction in 2011, completing the rebuild of Unit 3 of Boundary



Crystalizers at the water treatment plant, part of Mississippi Power’s Kemper County energy facility.

Dam and the new CCS facility within two years. SaskPower began commercial operation on October 1, 2014, which was celebrated with a ribbon-cutting ceremony, at which over 20 countries were represented.

“The technology and process used at Boundary Dam can be replicated on 95 percent of the world’s coal units,” says Mike Monea, president of SaskPower Carbon Capture and Storage Initiatives. “Being a ‘real, live’ project is significant, as the industry needs to see tangible operations to move from myth to reality.”

BD3 allows for value-added revenue opportunities, as SaskPower has secured contracts to sell many of the by-products of the CCS process; including carbon dioxide, sulfur dioxide that is converted to sulfuric acid on-site and sold for industrial purposes, and fly ash used as filler material in construction.

“We estimate this additional revenue stream will be in the tens of millions of dollars annually; that offsets our initial investment and means more cost-competitive electricity,” says Monea.

“We’re also pleasantly surprised that the purity of the CO₂ produced by this process is higher than we planned. At 99.99 percent pure, it will open up potential market opportunities for us in the future.”

SaskPower acknowledges the divisive environmental challenges associated with the use of coal; however, the company is also aware that power demand is growing in the province of Saskatchewan, North America and globally. The low cost and stability of lignite, not to mention its accessibility, will continue to make coal an increasingly attractive energy source around the world. And should the technologies of SaskPower help in reducing coal’s overall effect on climate change, then the effort was well worth it.

“Coal is a growing fuel used to generate power on a global scale. Cleaning up the majority of its emissions is extremely important,” says Monea.

“That is why this project is important. Our process notably removes 100 percent of

the sulfur dioxide produced at the unit and up to 90 percent of the carbon dioxide, which means that at Unit 3, we are producing electricity in a way that is 10 times cleaner than another coal unit, and even four times cleaner than a comparable natural gas unit. BD3 can be explored as a real solution path to global climate change.”



GET TO KNOW OUR EXPERTS MICHAEL MONEA

Michael J. Monea joined SaskPower in 2008 as vice-president of Carbon Capture & Storage Initiatives for SaskPower. In September 2011, he was appointed president of this division.

Prior to his role with SaskPower, Monea was a senior vice-president with Canada Capital Energy Corporation. He served as executive director of the Petroleum Technology Research Centre at the University of Regina and was later appointed chairman of the board. In 2008, he was appointed to the Society of Petroleum Engineers Distinguished Lecture program, as an expert in enhanced oil recovery.

Monea holds professional engineer and geoscientist designations and is a member of the Canadian Institute of Corporate Directors.

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INSOURCING ND'S UREA

North Dakota has been importing urea for years. The granular fertilizer is often used in the agriculture sector. Soon, the state will not have to look beyond its borders; three urea plants will be opening in the state by 2017 (read more about this on page 64).

Dakota Gasification Company is opening a \$402-million urea production facility at its Great Plains Synfuels Plant near Beulah, ND. It will include a 53,000-ton storage facility and load-out facility for trucks and railcars, with the capacity to load up to 110 railcars in a single shipment. An estimated 1,100 tons of urea will be produced daily.

"We believe the addition of urea will bring more benefit to the agricultural community," says Paul Sukut, Dakota Gas interim CEO and general manager.

Urea production requires anhydrous ammonia and carbon dioxide, both of which are produced at Dakota Gas's Synfuels Plant. According to Dave Sauer, Dakota Gas senior vice-president and CEO, urea has the highest nitrogen content of all solid fertilizers, but costs less to handle, store and transport than other nitrogen-based fertilizers.

CHS Inc. is building a fertilizer manufacturing plant in Spiritwood, ND, which will produce urea. The \$1B facility is expected to start operation in 2016 and will employ between 100 to 150 people.

Northern Plains Nitrogen is building a nitrogen production facility in Grand Forks that will produce urea. The company claims it will be the safest, most efficient and environmentally compliant facility constructed. The 2017 crop should benefit from this facility's urea.

Sources: www.basinelectric.com/News_Center/Publications/News_Releases/dakota-gas-approves-urea-plant-near-beulah.html

www.chsinc.mediaroom.com/northdakota-nitrogenplant

www.agweb.com/article/northern_plains_nitrogen_to_add_ammonia_urea_uan_capacity

NORTH DAKOTA'S WINDY FUTURE

In 2010, North Dakota got about 12 percent of its energy from wind. The Natural Resources Defense Council thinks North Dakota could become one of the leaders in producing clean energy. This is due, in part, to its geography, making it the sixth-largest wind resource in the country. There is potential to harvest 770,000 megawatts, more than all fossil-fueled power plants in the country combined.

So far, that resource is largely untapped with only 1,424 megawatts of wind energy being harvested. While all counties are suitable for commercial wind production, only 13 out of 53 currently have developments in place. Though wind production is small, it has already created about 1,000 jobs in the state (read more on the next page).

Wind energy could begin to grow more rapidly in North Dakota. Google recently invested nearly \$39 million into two North Dakota wind farms run by NextEra Energy.

Source: www.nrdc.org/energy/renewables/ndakota.asp

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Wind & Water:

Harnessing Renewable Energy for America

By Meg Crane

Energy from offshore winds, waves and tides is coming to the United States, and it could have a huge impact on the industry in North Dakota.

Turbines have been floating in bodies of water in and around Europe for years, bringing renewable energy to businesses and citizens. According to Walter Musial, the principal engineer at the National Renewable Energy Laboratory (NREL), the United States is lagging behind Europe.

The United States tends to have more land-based industries than other places in the world, causing it to focus more on land-based energy sources. But things are changing.

“The industry is taking the lead from the EU and is developing right now,” says Musial. “It’s starting now because, just generally, the country needs to be looking at reducing its carbon footprint.”

While there could be some environmental impacts of harvesting offshore energy, it is known that offshore wind, wave, tide and current energy does not create carbon dioxide.

Musial says that installing turbines can have an impact on local ocean ecosystems. Some are too fragile for the intrusion. Consideration on the impacts of ocean life, including whales, migrating birds and endangered species, and careful planning, are imperative in ensuring that offshore wind energy is, indeed, sustainable in a particular location.



Wind park northern sea, offshore and wind turbines.

Musial says that one issue of installation is the amount and level of noise. Knowing that, they can look at how it will affect a potential wind turbine site and decide if there are ways to mitigate the issue.

By 2030, the United States could harvest enough offshore wind to power more than 42 million homes, estimates NREL.

In more densely populated regions, most sources of renewable energy are not feasible, says Musial. However, wind energy may be the solution to get clean energy into large, urban centers.

In fact, Verdant Power, Inc. has been supplying energy off and on for Manhattan from underwater currents in New York's East River for the past 12 years. This is the amount of time that it generally takes to go from a working prototype to being commercially ready.

But Trey Taylor, co-founder and director of Verdant Power, says current technology could not be used in North Dakota. Water depths need to be deep enough to support five meters diameter rotors, at least 28 feet and water currents need to move at a speed of 1.8 meters per second. There are not bodies of water in the state that fit these criteria.

But now that the project in New York is going so well, Taylor says that Verdant may start working on technology that could operate in shallower and slower waters. "It all takes time and engineering," says Taylor.

Energy from water movement is newer. Hydrokinetic turbines, underwater versions of the wind turbines and other devices are currently being tested. But there are other, more tested ways of harvesting offshore energy.

Offshore wind can be harvested above water through turbines, much like those located on land. The turbines are either fixed to the seabed or supported by floating platforms in deeper waters. Wind rotates the blades, and then a power generator converts that energy into electricity. The electricity is transported to shore through cables on the ocean ground.

It would also benefit local economies as the introduction of offshore wind energy will create jobs. More than 43,000 jobs could be created in the United States by the introduction of offshore energy, according to NREL. It would also bring in an estimated \$200 billion in new economic activity.

"A lot of the benefits from offshore wind can be taken advantage of by the oil and gas industry," says Musial.

This should be good news for North Dakota. According to the Natural Resources Defense Council, North Dakotans use

more energy per person than most other states, in part because of the local oil and gas industry.

Offshore energy is far off in North Dakota's future, but onshore wind energy is already having a large impact on the state. In 2010, Google invested \$38.8 million dollars into two wind farms in the state. The wind farms now produce 169.5 megawatts of power and can light up approximately 55,000 homes.

In addition, North Dakota is already one of the country's leaders in producing wind energy, generating about 12 percent of its energy from wind in 2010.

But there is only so much space for on-land wind farms in North Dakota, due to oil-fields and wildlife conservation efforts. When technology allows, offshore wind could reduce energy costs in the state, create jobs and reduce environmental damage. But, as Taylor says, it will take a while to get there. 

GET TO KNOW OUR EXPERTS WALT MUSIAL



Walt Musial is a principal engineer and the manager of offshore wind at the National Renewable Energy Laboratory (NREL) where he has worked for 26 years. In 2003, he initiated the offshore wind energy research program at NREL, which he now leads. Musial was also responsible for the development and implementation of the full scale blade and drivetrain testing facilities at the National Wind Technology Center.

He studied mechanical engineering at the University of Massachusetts in Amherst, where he earned his Bachelor's and Master's degrees and specialized in renewable energy and energy conversion with a focus on wind energy. He has over 60 publications and two patents.

TREY TAYLOR



Trey Taylor is a founder of Verdant Power. Previously, he founded the Interactive Marketing Institute; worked with BGE and Price Waterhouse; and worked at Edison Electric Institute, ITT Corporation, Ogilvy & Mather, and Procter & Gamble.

Taylor currently serves on the Renewable Energy & Energy Efficiency Advisory Committee for U.S. Department of Commerce and NYC's Green Export Initiative Advisory Council.

He also served on the board of directors for the Hydro Research Foundation, chaired the R&D Committee for the National Hydro-power Association, helped charter the Ocean Renewable Energy Coalition and participated on the CEO Council for the American Council on Renewable Energy.

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Eureka!

Urea Production in North Dakota

By Andrea Danelak

Local agricultural producers are about to gain easier access to a product that's making waves in the application of nitrogen to crops.

More and more producers are switching to urea, a granular fertilizer with the highest nitrogen content of all solid nitrogenous fertilizers, and by doing so, are replacing a field that was once dominated by anhydrous ammonia.

"Urea is safer to apply, use and store—and it has a much higher nitrogen content (than other dry products), so we know it will be well-received by the farmers," says Curt Pearson, manager of media and community relations at Basin Electric Power Cooperative.

HUGE INVESTMENTS

To fulfill demand, the Dakota Gasification Company (DGC) has made its biggest dollar investment in a new product to date by building a new, state-of-the-art urea plant. With the plant, the DGC will be poised to manufacture both anhydrous ammonia and urea for supply to the surrounding region.

"We're planning on producing 1,100 tons of granular urea product per day. That's the main goal of the project: to take a portion of the anhydrous ammonia, process it under heat and pressure with carbon dioxide, and from that, produce urea," says Jim Greer, senior project manager at Basin Electric Power Cooperative, DGC's parent company. "We'll be introducing urea as our 11th product."

CLEANER PRODUCT FROM THE SOURCE

Located at Great Plains Synfuels Plant near Beulah, ND, the new facility will primarily market urea to local and regional agricultural communities but will also ship around the country and into Canada.

"The local area will soon have a readily available source of urea," says Greer.

And that is one of the key benefits of the new plant, according to Kyle Ferebee, agronomy manager at the Farmers Union Oil Co. plant in Beulah/Halliday.

"When we bring in imported urea, it's been handled so many times, which makes it harder for us to handle," he says. "If we're

able to pull product directly from a plant, we'll get a lot cleaner of a product that is easier to handle."

Scheduled for completion in early 2017, the new facility is projected to cost approximately \$402 million, with construction on the plant already well underway. The construction crew broke ground in July 2014 with some site preparatory activities and is on track to begin physical construction in spring 2015.

"There is a lot of activity going on right now," says Greer, who is leading the project for DGC and has overseen every step of the construction process. "Detailed engineering across all of the disciplines is underway, ranging from mechanical equipment installation drawings to concrete foundation drawings to electrical drawings. A lot of effort is going into preparing those plans and specifications, so we can have a successful construction effort."

Additionally, the project team is procuring major pieces of mechanical equipment, such as high-pressure pumps, heat exchangers, compressors and electrical power centers.

BIG THINGS IN THE WORKS

The next year will bring about exciting developments in the plant's construction, which include construction of a storage facility that can hold approximately 53,000 tons of granular urea. "This year [2015] is really critical in successfully completing the project by the second quarter of 2017, which is our goal," says Greer.

"In 2015, we'll be putting pilings in the ground to support the foundation this spring. We'll be erecting steel structures. We'll begin to install mechanical equipment and the power supply," he continues. "The plant will really start to take shape over the next year. We'll also be installing four new rail lines and the dirt work for that will be completed."

JOBS TO SUPPORT THE COMMUNITY

The project has brought a number of jobs to the area, both short- and long-term, and more than 700 people will be working on the plant during the peak of construction. Eventually, the plant will create 40 to 60 full-time operational and maintenance positions.

"Many of the full-time employees will choose to live in the county. They will have a positive impact on our taxes, they will shop locally and they will help support the community," says Pearson.

Coordinating the large number of people working on the project doesn't come without its challenges.

"There are a lot of individuals on the project team," says Greer. "It takes a lot of communication and coordination to stay organized. On top of the unique technology that we're deploying, we're also coordinating trips, emails and face-to-face meetings. We're trying to make sure that everyone is communicating and staying aligned with the project's goals."

But despite the challenges associated with working on a project of this magnitude, Greer is excited to add additional members to the team and work toward their goals.

"We're really going to form a full team here to make this all become a reality," he says.

LOOKING AHEAD

In addition to urea production, the new plant will also allow DGC to add a 12th product to its lineup—diesel exhaust fluid (DEF), which is now a requirement for injection into diesel vehicles. "We'll become a major producer of DEF," says Greer.

Greer looks forward to seeing what the future holds for both the plant and the use

Our corporate mission is to provide products that support rural America, so we're pioneering the introduction of urea into the farming community.

of urea. "The construction of this plant is a very exciting and very interesting project," he says. "Our corporate mission is to provide products that support rural America, so we're pioneering the introduction of urea into the farming community."

Urea's growing popularity may mark a larger shift from anhydrous ammonia, and Ferebee is eager to see how the next few years play out in the industry. "In western

North Dakota, I think we are still a long way from using urea exclusively, as many producers are still using anhydrous ammonia for nitrogen," he says.

"But in other parts of the country, producers are starting to drift away from anhydrous ammonia because of all of the regulations surrounding it. This gives us the possibility to phase out anhydrous ammonia in several years."

GET TO KNOW OUR EXPERTS JIM GREER



Jim Greer is a senior project manager at Basin Electric Power Cooperative, where he has been assigned to manage the Dakota Gasification Company's urea project. Greer joined Basin Electric in December 2013, bringing more than 20 years of project management experience in multiple industries, including energy, mining, mineral processing and semiconductor micro-electronics, as well as experience in the planning, engineering and construction of industrial facilities.

He is a former Air Force captain and obtained a Master of Business Administration degree from the University of Utah and a Mechanical Engineering degree from the University of Colorado Boulder. Jim also has an Energy Innovation Professional certificate from Stanford University.

CURT PEARSON



Curt Pearson is manager of media and community relations in the administration and communications department of Basin Electric Power Cooperative. Employed by Basin Electric for over 37 years, Pearson supports Basin Electric's media and public relations, new generation and transmission projects, and community relations activities.

Pearson attended Bismarck State College and the University of North Dakota, where he received a Master of Business Administration degree. He is a graduate of the National Rural Electric Cooperative Association Management Internship Program and is a certified cooperative communicator.

KYLE FEREBEE



Kyle Ferebee has been the manager of the agronomy department of Farmers Union Oil of Beulah/Halliday for the past three years. He graduated from North Dakota State University with a degree in Crop and Weed Science.



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Another One Bites the Dust

As one travels in western North Dakota on oil haul roads, the dust becomes thick, impacting the safety of travel; maybe impacting adjacent crops and livestock. The North Dakota Association of Oil & Gas Producing Counties approved and funded a study on dust, as proposed by the UND Civil Engineering department. The Fall 2014 edition of Basin Bits offered a sneak peek at the initial findings. Now, we take an in-depth look at the results and observations from the study.

By Danelle Cloutier

Trucks from the oil and gas industry are creating high amounts of dust in the western part of North Dakota, which is impacting crops and livestock, according to a recent study.

The North Dakota Association of Oil & Gas Producing Counties (NDAOGPC) contributed \$39,844 to a study that measured and compared dust from unpaved roads in five counties—McKenzie, Mountrail, Williams, Grand Forks and Cass. The purpose of the study was to compare dust from the western part of North Dakota to dust from the eastern part of the state and explore the effects of dust on health, livestock and crops.

Study lead and University of North Dakota (UND) civil engineering professor, Dr. Daba Gedafa, began the study June 1, 2014, and presented the results at the NDAOGPC executive committee meeting on November 5, 2014.

HOW IT WORKED

Researchers set up five metal posts at 30, 60, 120, 240 and 480 feet from the center of the major unpaved roads in each county on each side of the road, to account for wind direction. Each metal post had a jar at two, three and four feet from the ground, to measure the effect of height and distance on each side of the major unpaved road.

Gedafa and his team also set up radar traffic counters on the major unpaved roads in each county to determine the number of vehicles passing by, as well as the length of each



Dust jars set up on the east side of the Mountrail County site.



Driving behind a truck on a popular road in Williams County, ND.



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vehicle, which helped determine whether the vehicle was a car or truck. The counters also determined the speed at which each vehicle was travelling.

Each month, researchers replaced the dust jars with new ones and brought the dust-filled jars to the UND civil engineering laboratory to analyze the amount, size distribution and pH levels of the dust they collected.

Gedafa discovered the effects on livestock and crops by surveying farmers through county extension offices and associations. They received 57 responses to the online survey. They also got 13 responses over the phone from the people who own farmland and/or grassland adjacent to the test sites.

“Most of the people say dust has significant effects on livestock and crop yield,” says Gedafa. Calves and horses were particularly affected by dust; the main health concern for livestock is pneumonia and pinkeye. Dust from unpaved roads can also aggravate respiratory ailments for humans and animals.

THE RESULTS

Of the five counties in question, the three in the western region of the state had the highest amount of dust. Williams County had up to six times more dust than some of the counties.

“These people are the ones who have been suffering the most,” says Gedafa. “You can clearly see Williams County has been affected the most, based on the responses of the people.”

Gedafa says some people from Williams County told him they haven’t opened their windows in the last four or five years.

“One woman in Williams County said in three days they get the same amount of traffic they used to get in one year.”

In the first month, Williams and McKenzie counties had similar traffic. McKenzie started applying water as dust suppression once or twice per day, as needed, which reduced the amount of dust and showed that dust suppressants can work, if applied regularly. McKenzie also applied chloride once.

Even though McKenzie had the most dust within the first month, it came in second place for the amount of dust, overall, because the suppressant was effective. Mountrail was the third worst for dust and had a low number of vehicles compared to the western counties and a higher number of vehicles than the eastern counties. However, the county applied chlorides every month, which controlled the dust.

For Gedafa, the most surprising result was finding out how fast people are driving down unpaved roads. “How can a person drive

at 90 miles per hour on an unpaved road? Someone can lose control and lose a life.”

Dale Heglund, program director of the Upper Great Plains Transportation Institute’s North Dakota Local Technical Assistance Program (NDLTAP), agrees.

“The speed is off the charts,” says Heglund. “It supports the need for a strengthened public awareness campaign to address safety concerns.”

Heglund used the information from Gedafa’s study to help inform counties and promote better roads. He also gave an update on Gedafa’s study at a NDAOGPC meeting in the fall.

GOING FORWARD

Gedafa’s study also shows how much dust suppression helps. “The study also helps support the expenditure on dust control,” says Heglund.

As Gedafa points out in his report, a long-term solution to dust problems is paved roads. Although paved roads are more expensive upfront, in some cases, they could be cheaper than dust suppressants, which need to be applied often.

Now that this study is over, Gedafa recommends the following:

- Conduct detailed economic analysis to determine the cost-effectiveness of using dust suppressants regularly on highly travelled, unpaved roads (average daily traffic more than 500) as compared to paving them;
- Estimate the monetary value of the impact that dust from unpaved roads has on crop yield and livestock using economic analysis;
- Post speed limits that are appropriate under existing road, traffic and weather conditions;
- Enforce speed limits on unpaved roads to reduce the amount of dust and improve the safety of the public; and
- Investigate the effect of spring load restriction policy of the North Dakota Department of Transportation on county and township roads.

This report is just one more tool for county commissioners and policymakers to address road issues.

“There isn’t a silver bullet to fix the problems associated with roadway dust,” says Heglund, “but if we give transportation leaders information on best practices, they can make economically-sound decisions that result in roadway improvements.”

GET TO KNOW OUR EXPERTS DR. DABA GEDAFU, PH.D., P.E.



Dr. Daba Gedafu has been an assistant professor in the civil engineering department at the University of North Dakota (UND) since August 2011. He was an assistant professor at the University of Connecticut for two years before he joined UND. He received his Ph.D. in civil engineering from Kansas State University in December 2008 and stayed there as a post-doctoral research associate until he joined the University of Connecticut in August 2009.

Gedafu’s areas of research include mechanistic-empirical pavement design; pavement management systems; construction quality control and quality assurance; recycled materials and nanotechnology for sustainable infrastructure; impacts of dust from unpaved roads; and traffic and pedestrian safety. Gedafu is a registered professional engineer in the states of North Dakota and Connecticut.

DALE HEGLUND, PE/PLS



Dale Heglund has been director of the North Dakota Local Technical Assistance Program since 2014. Prior to his position with the Upper Great Plains Transportation Institute, he worked for 14 years as a sales engineer for Cretex Concrete Products.

Heglund received his civil engineering degree from the University of North Dakota and has since become a registered professional engineer and professional land surveyor in North Dakota. He also graduated from the Bismarck-Mandan Chamber of Commerce Leadership Development program.

Heglund has had a wide variety of growth opportunities, beginning with learning how to produce with a shovel and backhoe on his family’s Northern Minnesota dirt construction business back when he was a kid, to now helping North Dakota’s transportation system leaders grow.



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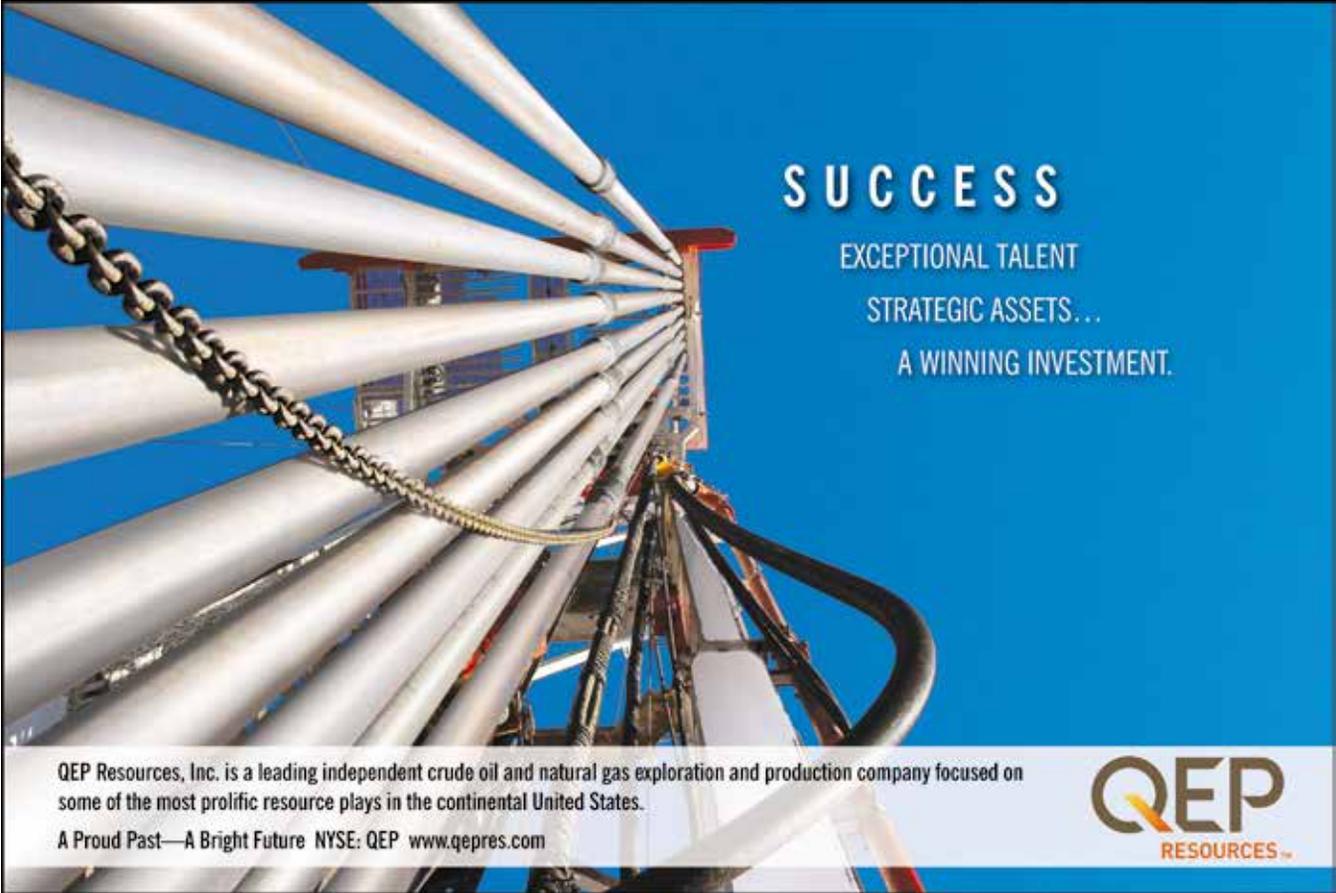
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Set Your Sights:

Recruiting Women for the Energy Sector

By Meg Crane

In North Dakota, the demand for workers is outstripping supply, as jobs remain unfilled for lack of qualified workers. This is a problem across the nation. Schools are stepping up to help draw more people into the industry. But they are not looking to recruit potential workers who will fit into the crowd; schools are recruiting populations of people not traditionally seen in the oil and gas industry. One of those populations being recruited is women.

Latha Ramchand, dean of Bauer College of Business at the University of Houston in Texas, is a strong believer in having diversity in the workforce, as it can improve how businesses are run and increase shareholder value. When there is not diversity in the workforce, it can be hard for people who do not see themselves represented to break into a space, including the male-dominated gas and oil industry.

“We are sensitive to the fact that there are some demographics that make it more

challenging for women to be represented in the workforce,” says Ramchand. That is why the college works to draw women into its program and prepare them for the industry.

NO BETTER TIME THAN NOW

There’s no time like the present, and now is a great time to join the industry’s workforce. “Over the last few years, there has been an increase in demand for energy professionals,” says Ramchand.

Rough estimates show that there will be a growth of managerial and professional roles in the industry. About 85,000 white collar jobs in the sector will need to be filled, and most of them are non-secretarial positions, says Ramchand.

The college hosts open houses to show anyone who is interested in their programs what they have to offer, but they also host sessions that are specifically aimed at women. Ramchand says that the Bauer MBA Information Session for Women has

been popular in the past. The event brings potential students together with current students and alumni.

Along with the Houston Business Journal, the college hosts Mentoring Mondays for Women. It also hosts women-only events at the college, sponsors the Young Women in Energy and works closely with the Women’s Energy Network.

“We have a local, college chapter,” says Ramchand. This chapter of the Women’s Energy Network brings in speakers, plans field trips and discusses what is new in the industry.

“These young women do a great job in raising awareness about the energy sector,” says Ramchand.

In the co-ed classrooms, many of the speakers are women from the industry.

Ramchand hopes that this focus on women will break down barriers and show that women are capable of being successful in science, math- and business-related industries.



With programs focusing on drawing in women, the gender-split will begin to even out...

"If it's energy, we want to be there. If it's women, we certainly want to be there," says Ramchand.

DIVERSITY IN THE WORKPLACE

Over at Stark State College's ShaleNET Regional Hub in Canton, OH, it is a bit of a different case.

Jean Barbato, case manager for the hub, says, "I don't know that I'd say I'm recruiting women. I'm recruiting students." She is focused on bringing in all people who are not traditionally in the industry, so that the college can have a diverse population.

"Anytime you can get diversity in the workplace, it is important," says Barbato,

adding that it brings different perspectives to the table.

For example, men and women have different processes for dealing with problems, suggests Barbato. She sees this in the classroom and says it may have something to do with how they are brought up, but that it may also have to do with

Continued on page 74

GET TO KNOW OUR EXPERTS

LATHA RAMCHAND



Latha Ramchand is Dean and professor of finance at the C. T. Bauer College of Business at the University of Houston. Ramchand teaches

in the areas of corporate and international finance, and risk management. She received her Ph.D. in finance at Northwestern University where she attended the Kellogg Graduate School of Management.

She is a gold medalist in economics from Bombay University where she graduated with a master's degree in economics. Ramchand is a noted expert and speaker on several topics, including international and corporate finance, energy education, corporate governance and leadership, global business, energy and the economy, and women in leadership.

JEAN BARBATO



Jean Barbato is currently the ShaleNET regional hub case manager at Stark State College in North Canton, OH. Her focus is on the recruitment, advising and job placement of students in oil and gas technology.

Most recently, Barbato was the intake enrollment manager at Walsh University, where she designed a lead management system and taught business classes. She is active in the community in the Chamber of Commerce and Women's Impact. She holds a bachelor's degree in management and an MBA from Walsh University.

Jean lives in Perry Township, where she is a business owner with her husband of 32 years.

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Continued from page 73

the gender-split in the industry. Currently, only about eight percent of students in the program are women. "In the industry, where women are the minority, women think more because they don't want to suggest something that won't work—they don't want people to think that she, or women in general, don't know what they are doing," says Barbato.

SHAPING DECISION-MAKING

While, traditionally, women were not working in the oil and gas industry, Barbato

has a few theories as to why that continues to hold true today. For one, many people think that being in the field involves a lot of grunt work and getting dirty; when the people with these beliefs are the parents of women who might be considering a profession in the industry, they might become a deterrent in their children's decision-making.

Barbato has seen this first-hand. Stark State College has dual enrollment with some high schools. In one session, there was only one girl and 23 boys. The high school teacher accompanying the students said that three other girls had wanted to join the program, but their parents would not let them.

They did not want their daughters digging and getting dirty for a living.

"I'm going to actually go and talk to parents," says Barbato. She wants to educate them about all the different career paths in the industry, including technicians and mechanics, so she is going into high schools to educate the parents. "There's a lot of money there," says Barbato, and she plans to tell parents this.

MENTORING RECRUITS

Once women are in the program, Barbato says they have support from another woman in the industry: her. "I'm a case manager, and it enables me to be more of a mentor to all of my students," says Barbato. That is of particular help to women in the classrooms, who frequently email her or drop-in to her office.

"They need mentoring to get through [the program] because there are fewer females in the classroom," says Barbato. "It's going to be harder for women."

While entering the industry may be more difficult for women, they are not being deterred. And with programs focusing on drawing in women, the gender-split will begin to even out, making it easier and easier for women to enter the industry and alleviating employee shortages at the same time.



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OPEC Meeting

What's the sweet-spot price in McKenzie County??



Cartoonist Kevin Holten, holten24@gmail.com

Worth the Wait: Killdeer's New Community Center Opens its Doors



The High Plains Cultural Center opened its doors in Killdeer, ND, with a grand opening in December 2014. The \$3.3 million center promises to be a hub of community interaction.

By Jennifer Ryan

After a decade of planning and building, the High Plains Cultural Center has opened its doors in Killdeer, ND. Located on Highway 22, the \$3.3 million center promises to be a hub of community interaction.

The center held its grand opening in December 2014, with a Christmas event for 400 guests: a community potluck complete with choral and band entertainment, gifts, and a visit from Santa Claus.

Executive Director Ken Roshau boasts that community residents have taken a real ownership and sense of pride in the facility already.

“The community reaction has been very positive. It was the best-kept secret in

Killdeer,” he says. “They’re amazed at what’s here and they love it. They contribute to it and take care of it like it’s their own.”

FUTURE EXPANSION

High Plains Cultural Center boasts a fully equipped gymnasium with a 100-meter walking track and exercise equipment, and there are plans to further expand facilities in the future, with a museum and gift shop included in the expansion. Popular yoga and Zumba classes are now available for members, as well as various dance and exercise classes. Sports leagues, such as basketball and volleyball, are planned to begin in 2015.

The center’s banquet area and meeting room are configurable for different sizes of groups and

are available for bookings. The potential for community events is far-reaching and varied: dances, concerts, viewings of movies or sporting events, conferences, and cultural activities.

High Plains plans to book training functions for oil companies in the region, and can also host functions such as awards banquets and even weddings. Previously, oil companies had to look to event facilities in Dickinson, 33 miles away, where brides and grooms-to-be were facing wait times of up to two years to find a date for their nuptials.

Plans to construct the new cultural center began in 2004, as a grassroots effort by some local citizens who now serve as the center’s board of directors. It took many years of perseverance to make their vision a reality.

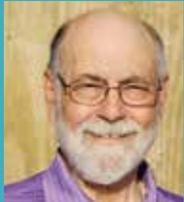
"They're loyal and hard-working people. I believed in their dream," says Roshau. "I think the community does too. They're pitching in."

Roshau was officially hired to be the executive director. His role soon evolved and found him wearing many different hats, especially a hard hat. He was onsite almost daily, pitching in as construction manager and making decisions about sound systems and color schemes.

EVERYTHING COMES AT A COST

The center's price tag came in at \$3.3 million, which Roshau says is standard for a regional center of this scope.

GET TO KNOW OUR EXPERTS KEN ROSHAU



Ken Roshau is the executive director of Killdeer's High Plains Cultural Center, and in that role, wears a variety of hats.

Previously, he worked for 21 years as the director of youth ministry for the diocese of Bismarck. When his wife was offered a teaching position at Killdeer School, they relocated, though they still spend time at their home in Dickinson.

Roshau enjoys working with people of all backgrounds and describes his family as community-minded and honest. When Roshau manages to find spare time in his busy schedule, he enjoys boating, camping and fishing, and above all else, playing golf.

DARYL DUKART

Daryl Dukart is serving his second elected term as Dunn County Commissioner. Dukart developed an interest in local government at college.

"I enjoy working with and for the citizens," he says. That passion has led to his current position, advocating for the people of the fourth-largest oil producing county.

As spokesperson for the western North Dakota county, his priority is sustaining and continuing to build infrastructure, "so the rest of the state can also benefit from the rewards the oil boom has brought."

Dukart lives with his wife in Dunn County, where they enjoy attending the sports and school events of their seven grandchildren.

"In normal times, it could have been \$700,000 less, but the increased costs of labor, material and trucking in this region drove prices up."

The Dunn County Commission chipped in nearly half of the total cost. The rest came from energy-impact grants, local donors, fundraising efforts, and a \$1.2 million loan that the center continues to pay off.

Commissioner Daryl Dukart says contributing to the project was important.

"We contributed our funds over two years, and we're impressed with the results," he says. "We're looking forward to the public taking advantage of the health,

wellness, entertainment, and social offerings at High Plains."

Early in 2015, the center had 80 members already. "I'm hearing a very positive response," says Dukart. "It's not yet being used to its full capacity, but I'd guess it's going to meet its capacity pretty suddenly."

Membership to High Plains Cultural Center costs \$25 per month. The center is open Monday to Friday from 8 a.m. to 8 p.m. and Saturdays from 8 a.m. to 5 p.m. On weekdays, a cafeteria-style lunch selection will be available from 11 a.m. to 1 p.m. The center is closed on Sundays.

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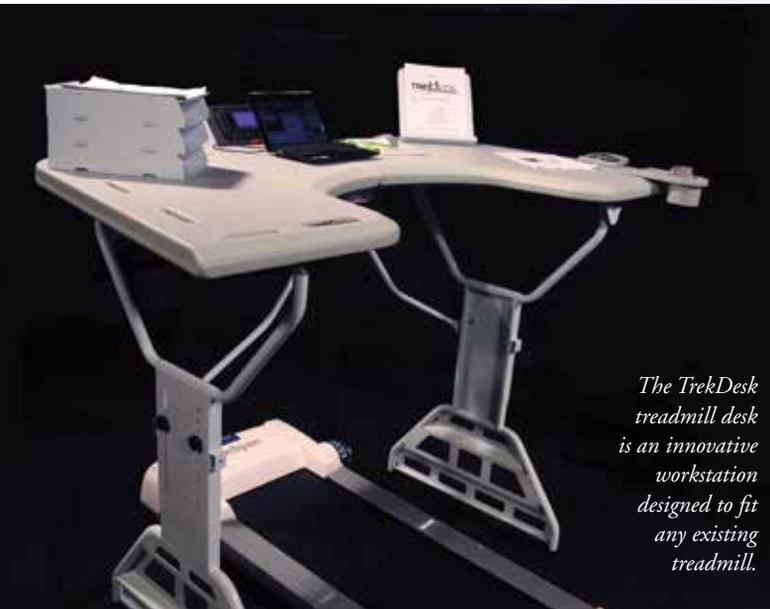
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GAS DETECTION

Defeating the Problem at its Core:

Using Science to Battle North Dakota's Obesity Rate



The TrekDesk treadmill desk is an innovative workstation designed to fit any existing treadmill.



Those who use the TrekDesk can raise their physical activity level throughout the day, while on the job.

By Simon Peacock

The obesity rate in the United States has almost doubled since the 1980s and it continues to climb, with 30 percent of the adult population now classified as obese. North Dakota ranks 15th in the nation for overall obesity rates, with 29.7 percent of adults falling into this classification. Obesity-related health risks include heart disease, stroke, Type 2 diabetes and certain types of cancer, all of which are preventable diseases. Many attribute the super sizing of the American diet to the growing obesity rates, but is that really the case?

STUDYING CAUSES AND RISKS OF OBESITY

A study by Stanford University has shown that dietary trends and caloric intake of Americans has remained a steady constant throughout the years, and that more inactive lifestyles are the primary reason the overall health of the nation is at risk.

According to the 2014 study entitled *Obesity, Abdominal Obesity, Physical Activity, and Caloric Intake in US Adults: 1988 to 2010* by U. Ladabaum, A. Mannalithara, P.A. Myer and G. Singh, “We examined trends in obesity, abdominal obesity, physical activity and caloric intake in U.S. adults from 1988 to 2010. Obesity and abdominal obesity are associated independently with morbidity and mortality. Physical activity attenuates these risks.”

The Centre for Disease Control (CDC) shows the amount of American females reporting no physical activity jumped from

19.1 percent in 1994, to 51.7 percent in 2010, and adult male inactivity leapt from 11.4 percent to 43.5 percent.

So, what is the cause behind the drop in physical activity? Steve Bordley, CEO and innovator of the revolutionary TrekDesk treadmill desk, says the introduction of new technology and more sedentary lifestyles are the largest factors in declining levels of physical activity.

"We have seen a huge shift since the late '80s, with the emergence of computers and increased sedentary leisure activities," says Bordley. "Technology got us into this lifestyle rut, but it can also take us away from it."

PUTTING "WORK" INTO YOUR "WORKOUT"

The TrekDesk treadmill desk is an innovative workstation designed to fit any existing treadmill. It grants its user the ability to raise their physical activity level throughout the day, while on the job.

"I have found that one of the biggest issues keeping people from getting active is a lack of time," says Bordley. "The TrekDesk allows you to be active without taking any extra time or motivation."

The TrekDesk treadmill desk can easily be set-up to operate in any corporate or home office, while offering a myriad of health benefits. Along with promoting weight loss and helping prevent many heart- and cardiovascular-related diseases, the TrekDesk can also be beneficial to those suffering from chronic back and joint pain. The act of sitting for an entire work day can be very strenuous on your joints and muscles.

"Convincing people that chairs were hazardous to their health was met with disdain and disbelief, even within the medical community," says Bordley. "But times are changing and science has now

equated the health hazards of sitting on the same level as smoking cigarettes."

DON'T SWEAT IT, GET RESULTS

Those who use the TrekDesk on a daily basis are raving about what it has helped them achieve. Cindy Mayhak spends her days working as an accountant in the offices of Paul Davis Restoration in Vancouver, WA. She has been using the TrekDesk for five years and hasn't looked back since.

"I have been able to get in additional slow fat burn 'workouts' during my workday; that helps me maintain an active lifestyle, which helps my body feel better and, in turn, have a better emotional well-being," says Mayhak. "It also keeps me from having terrible back pain, which I experience if I try to sit for more than a few hours. Standing or walking is the only way to go, to feel good and healthy throughout the work day." It didn't take long for Mayhak to realize just how beneficial to her health the TrekDesk was.

"I lost 55 pounds in the first two years. I feel that standing/walking at my TrekDesk has allowed me to maintain that loss without doing much exercise," she says. "I'm also able to maintain a good base of fitness that allows me to go outside and walk 5K, 10K and half-marathon distances without much training at all and no ill effects on my body." Mayhak believes everyone can benefit from using the TrekDesk treadmill desk and strongly encourages anyone looking to improve any aspect of their lifestyle to give it a try.

"It's helpful for your health, for your emotional well-being, and for your productivity," she says. "Plus, it never hurts to see people come through your office building and do a double-take when they see the set-up I have. They always mention what a neat idea it is!"

GET TO KNOW OUR EXPERTS CINDY MAYHAK



When Cindy Mayhak first "Liked" the TrekDesk Facebook page, she had no idea it would lead to winning her very own. Going from sitting at a desk all day, to spending her entire workday walking on the TrekDesk, she now understands the benefits of adding more physical activity to her daily routine and just how easy it was to do.

Read Mayhak's blog at www.trekdeskwalk.blogspot.ca to follow the progress she has made over the course of five years, using her TrekDesk.

STEVE BORDLEY



When Steve Bordley suffered a severe injury that left him wheelchair-bound and immobile, he sought an alternative means of exercise. This led to the creation of the TrekDesk treadmill desk. Needing exercise that wouldn't be too strenuous, it was just what he needed.

Bordley soon found how beneficial the simple act of walking could be, and he now works tirelessly to educate others about the curative powers of walking and the health hazards of sedentary lifestyles. Learn more about the TrekDesk treadmill desk at www.trekdesk.com.

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By Paul Adair

As oil production in North Dakota continues to expand, industry has been increasingly turning to rail as the preferred mode of transportation for moving Bakken crude out of state; trains now account for as much as 60 percent of all oil being shipped. Just five years ago, U.S. railways managed around 21,000 barrels per day of oil, while, today, they carry over one million barrels in a day.

Unfortunately, this increase in train usage has seemingly led to an upswing in the number of rail accidents involving crude. Take, for example, the highly reported accidents in Casselton, ND, 14 months ago, and in Lac-Mégantic, Quebec, Canada, 19 months ago.

Incidents such as these have, in turn, have shaped negative public perception over rail safety and resulted in grown concerns related to the risks associated with moving oil by train across the United States. To help alleviate concerns, the North Dakota Industrial Commission (NDIC) has introduced strict new standards governing the volatility of the crude that is being moved out of the Bakken.

As of April 1, 2015, energy companies operating within North Dakota will be required to process their crude oil through specialized equipment that lies close to the well site. These “heater-treaters” are intended to heat up the liquid to a minimum of 110° Fahrenheit, at a pressure of 50 pounds psi, removing the potentially explosive natural gas liquids, such as propane and butane.

National standards currently recognize oil with a Reid Vapor Pressure (RVP) of 14.7 pounds per square inch (psi) or less to be stable. The goal of the new state requirements is to produce a crude oil that does not exceed an RVP of 13.7 psi; an RVP similar to that of gasoline.

Legislative Line: Lowering Crude Volatility for Rail Transport

READYING TO MEET REQUIREMENTS

The burden placed on North Dakotan energy companies will vary; some will need to make capital investments in new equipment, tankage or vapor pressure monitoring equipment, and training of personnel. Conservative estimates suggest the industry will be required to make a \$20 million investment in equipment and operating costs, which will average out to about 10 to 20 cents per barrel.

For the majority of operators—approximately 80 percent—not much will need to be done in order to comply with the new regulations. For others, however, adjustments will be required in regard to the temperatures and pressures at which their well site equipment operates. This small minority of operators will also need to confirm their compliance through third-party testing and will then need to report to the commission that their RVP is within the required parameters.

A small estimated percentage of operators—around five percent—must seek alternative methods of conditioning or stabilizing crude and will need to request approval from the commission through a request for notice and hearing.

TRANSPORTING CRUDE SAFELY

Despite these new requirements regarding crude volatility, it should be noted that crude oil will always remain a flammable liquid, even when conditioned. After all, this is why oil is being produced in the first place. However, the millions of barrels of oil moved by rail out of North Dakota each and every day are transported in a safe and professional manner, and it is an extremely rare occurrence that an incident should ever take place.

“Flammable liquids, along with all other hazardous materials offered for transportation are regulated by the U.S. Department of Transportation, under the Pipeline and Hazardous Materials Administration,” says Kari Cutting, vice-president of the North Dakota Petroleum Council (NDPC).

“All hazardous materials moved by rail arrive at their destination safely without incident 99.997 percent of the time. These rules are trying to be one part of a group of incremental improvements for the 0.003 percent of incidents that do occur.”

ENFORCING THE REGULATIONS

The new rules are to be enforced by more than 30 field inspection staff that will visually inspect gauges on facility equipment to determine operating temperatures and pressures. Operators who are found to be in violation

This is a national—even international—issue of safety. The point of this order is to make oil more predictable, so it is safer.

of the new rules could be fined a penalty of \$12,500 per day until they illustrate to officials they are compliant. It should be noted, however, that the vast majority of energy companies operating in North Dakota strive to ensure they meet the benchmarks of these standards.

“The biggest challenge we’ve had is the amount of follow-up questions we’ve received from those in the industry, so they make sure they are in compliance,” says Alison Ritter, public information officer for the North Dakota Department of Mineral Resources.

“This is an important issue, and many of the operators in the state are committed to responsible development and remaining in compliance.”

The process of bringing these new requirements to fruition commenced last August, when the NDIC hosted a meeting to hear results from an industry-funded study on the characteristics of Bakken crude oil. The study was commissioned by the NDPC and administered by Turner, Mason and Company.

After hearing the study results, the NDIC requested a special hearing, to be conducted by the oil and gas division, to take testimony regarding transportation safety and the marketability of crude oil. The hearing, which was held September 23, 2014, heard from 19 witnesses and received hundreds of pages of comments for consideration.

The proposed order was written and presented to the NDIC for decision by mid-November 2014, and was later amended to clarify language, reduce operating temperatures to accommodate for pipeline transport, and specify the testing methods producers must use. The final order was presented to, and unanimously approved by, the commission on December 9, 2014.

“This is a national—even international—issue of safety,” says Ritter. “First and foremost, the public will benefit when we can have crude oil moving through communities that acts like gasoline. The point of this order is not to make oil less flammable. It is to make it more predictable, so it is safer.”

GET TO KNOW OUR EXPERTS

ALISON RITTER



Alison Ritter joined the North Dakota Department of Mineral Resources in 2011 as the public information specialist, after five years of work at KFYZ-TV in Bismarck, ND. While at KFYZ, Alison was a two-time winner of the Northwest Broadcast News Association’s Eric Sevareid award. She is a 2006 graduate of South Dakota State University, where she majored in Communications.

When she’s not busy trying to keep up with the ever-changing oil and gas industry, she’s busy trying to keep up with her husband Bryce and their two sons, Boedy and Benson.

KARI CUTTING



Kari Cutting is vice-president of the North Dakota Petroleum Council (NDPC). Cutting has a diverse background, which includes chemistry, sales, marketing, and transportation management experience, with over 25 years in the North Dakotan energy industry. Cutting manages regulatory activities and strategic operations for the NDPC.

As a North Dakotan native, Cutting earned a Master of Science degree in Management from Minot State University and a Bachelor of Science degree from University of North Dakota. Cutting was appointed by Gov. Dalrymple to serve on the North Dakota Pipeline Technical Advisory Committee and the Petroleum Tank Release Compensation Committee.

ND Senate Passes Bill to Approve Keystone XL Pipeline, Obama Vetoes Bill

By Paul Adair

The beginning of 2015 has inched the much maligned and misunderstood Keystone XL pipeline saga closer to conclusion, as the Republican-controlled Senate made good on a promise to pass a bill, written and introduced by Sen. John Hoeven, to approve the pipeline project, circumventing the Obama administration's seemingly never-ending reviews of Keystone XL.

The passage of this bipartisan bill now puts the ball squarely into the White House's court, with President Obama already having pledged to veto the measure.* While Republicans—and some Democrats—have espoused Keystone's ability to create jobs, grow the economy, and make the country safer by lessening the nation's dependence on foreign oil, the president has downplayed the economics of the pipeline, criticized its environmental impact, and questioned Keystone's overall benefit for the American people.

"The greatest challenge for Keystone has been the conflation of political hyperbole surrounding its construction, which has spurred misinformation about what oil sands are and what impact their continued development will have on increased carbon emissions," says Sen. Heidi Heitkamp.

"For too long, the Keystone XL pipeline has become an overly politically charged issue, in which emotion has taken over and facts have left the room. Keystone has transformed into something different, and much bigger, than what it really is—from an energy infrastructure project into a cause for both the right and the left."

Certainly, much of the opposition to Keystone may have been made in lockstep

with the claims of left-leaning special interest groups, particularly those of the environmental movement, who desire to see the global use of all fossil fuels curtailed. However, this entrenched position would, ironically, end up increasing the oil industry's overall carbon footprint, while driving up the cost of energy for American consumers and businesses.

"Keystone has more safety features than required and, according to a review by the president's own state department, building the pipeline will result in lower emissions than not building it, as the oil would still move via rail if Keystone were not built," says Sen. Hoeven, who introduced the bill in January with co-sponsor, Sen. Joe Manchin (D-W.Va.).

"The president now has no more excuses left to delay or deny Keystone XL. We need

to empower investment in new technologies that will enable us to produce more energy with good environmental stewardship, regardless of the source."

Should the president veto the bill*, it does not necessarily mean that Keystone is dead. Policymakers could attach the approval language to another must-pass bill that the president would find difficult to veto or that might find enough Congressional votes to overcome a veto.

"This has been going on for six years and still isn't complete," says Sen. Heitkamp. "That's longer than the Second World War. Right now, it is up to the Senate to find four more votes, so we could override a presidential veto. It's a tall order, but we'll keep pressing for more support, so that we can move ahead with our larger energy goals for this country." 

OBAMA VETOES BILL

The following is a press release from February 24, 2015, from the White House.

Veto Message to the Senate: S. 1, Keystone XL Pipeline Approval Act TO THE SENATE OF THE UNITED STATES:

I am returning herewith without my approval S. 1, the *Keystone XL Pipeline Approval Act*. Through this bill, the United States Congress attempts to circumvent longstanding and proven processes for determining whether or not building and operating a cross-border pipeline serves the national interest.

The Presidential power to veto legislation is one I take seriously. But I also take seriously my responsibility to the American people. And because this act of Congress conflicts with established executive branch procedures and cuts short thorough consideration of issues that could bear on our national interest—including our security, safety, and environment—it has earned my veto.

BARACK OBAMA

**Editor's note: Under U.S. law, a presidential veto can be offset if a bill gets two-thirds majority in either the Senate or the House of Representatives. After the announcement of Obama's veto on February 24, 2015, Republicans suggested bringing forward new legislation to approve the pipeline.*

GET TO KNOW OUR EXPERTS SENATOR HEIDI HEITKAMP



Taking the oath of office on January 3, 2013, U.S. Sen. Heidi Heitkamp is the first female senator elected from the state of North Dakota. In her first two years in the Senate, Sen. Heitkamp has proven herself to be a senator who works across the aisle to fight for all North Dakotans. She has demonstrated that if senators work together, it can lead to real solutions.

Sen. Heitkamp received her B.A. from the University of North Dakota and obtained a law degree from Lewis and Clark Law School.

She lives in Mandan, ND, with her husband, Dr. Darwin Lange, a family practitioner. They have two children, Ali and Nathan.

SENATOR JOHN HOEVEN



Sen. Hoeven earned a bachelor's degree from Dartmouth College in 1979 and a master's degree in business administration from Northwestern University in 1981. He served as executive vice-president of First Western Bank in Minot, ND from 1986 to 1993 and established a strong position of service in many civic, community and economic development activities prior to elective office.

From 1993 to 2000, he served as president and CEO of Bank of North Dakota. He served as governor of North Dakota from 2000-2010 and has been serving as a United States senator since 2011.

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MAKING SENSE OF INVESTING

Getting Back to Earth:

Ag & Energy Working Together

By Jason Spiess

“**W**hat I tell pipeline and companies is that this is a farming and ranching state.

When you go out and talk to a landowner about an easement, you need to treat them like they were your mother,” says North Dakota Gov. Jack Dalrymple.

“Anybody who tries to expedite or use high pressure or any other intimidation in North Dakota is going to be very sorry.”

Those words, uttered by the governor, speak volumes in the Bakken and they are not going unheard by industry.

“First of all, those two are the premiere industries of the state and are very important here, and we recognize that, especially when working with landowners,” says Harold Hamm, CEO of Continental Resources.

Continental Resources is the largest oil producer in the Bakken oilfield, at least until the Whiting/Kodiak deal is finalized. Then, Whiting Petroleum is slated to be the Bakken’s top producer, and CEO Jim Volker is very aware of the relationship between agriculture, energy and landowners.

“The relationship with ag and the oil and gas industry is one that goes back to the founding of our industry. That’s why we call our departments that work with the surface owners our land departments,” says Whiting Petroleum CEO Jim Volker.

“And we honor those relationships, because without them, we don’t have a place to

Ron Ness, president of the North Dakota Petroleum Council, discusses the importance of reclamation.



drill. So, it’s very important for us to be good stewards of the land, air and water, as well as the oil and gas resource.”

Volker believes Whiting sets an example for good practices for the industry, with challenges to constantly improve.

“We are doing a lot of things, whether it is the eco-pads that Harold just talked about, or the natural gas processing plants and the pipelines,” Volker says. “Whiting has about \$600 million dollars tied up in the plants and pipelines we put in here to capture that natural gas resource. It is our responsibility to see that it works well for the surface owners and mineral interest owners, who in this state, fortunately, are many private individuals who are farmers and ranchers. It also has to work well for the state, as a whole, so we maintain that quality of life. We all want to see that quality of life, if not maintained, improved.”

RECLAIMING LAND

Although there are some hiccups, Gov. Dalrymple says he has seen the industry demonstrating proper behaviors when it comes to reclamation and land owners.

“I think the companies have learned how to treat landowners properly over the past few years. They are showing a lot of good practices out there, for the most part. And they are having success.”

Alison Ritter, public information officer with the North Dakota Oil & Gas Division, believes topsoil is one of the key elements in the reclamation of land.

“Prior to the 1980s, there were no regulations, in regard to saving topsoil. When the Oil & Gas Division was formed in the 1980s, one of the first rules implemented was saving topsoil,” says Ritter.

“Today, topsoil is stockpiled, so that after development, the land is reshaped and returned

as close as possible to the original contour. The area can be reseeded with appropriate native fauna or crop. It's not a process that happens overnight, and it can sometimes take years to get a site returned to its original condition."

Cody Vanderbush, reclamation specialist with the North Dakota Oil & Gas Division, agrees that topsoil regulations are extremely critical for proper reclamation, and says new technologies and methods have been instrumental in restoration.

"Over the past decade or so, we have gained a better knowledge on everything from better seeding, to erosion control, to hydroseeding," says Vanderbush.

DECREASING THE INDUSTRY'S FOOTPRINT

Another factor in today's reclamation world is pad drilling. The advent of pad drilling has created new opportunities in extracting oil and has allowed increased opportunities to decrease the footprint created by the oil and gas industry.

"Previous to multi-wells, the footprint was about 10 percent," says Ritter. "Then, in 2006 and 2007, we got down to four or five percent. Now, we are at less than one half of one percent."

According to Ritter, the typical well pad is approximately four to five acres and averages about four wells per pad; however, the well numbers do vary, with the largest drilling 14 wells.

"Whether there are four or 14, the steps for reclamation are the same," says Vanderbush. "Ultimately, everyone's goal is to get the land back to its original state."

According to Hamm, the "eco-pad" has been very instrumental in the advancements

of not only oil extraction, but of the reclamation of the land, too.

"The eco-pad development has been tremendous, and the lateral development minimizes surface usage and has worked very well."

RESIZING AND REPLACING PIPELINES

Eco-pads are just one example of how oil and gas companies have transformed their business model to satisfy the ag relationship, while improving day-to-day operations. Pipelines, on the other hand, are a different story.

According to Lynn Helms, director of the North Dakota Department of Mineral Resources, all of the pipes that have been put in the ground after 2007 will have to be resized or replaced. This is currently underway, creating new challenges for the state, its citizens and the industry.

"The installation of the larger pipes bring us to the next problem, which is that a lot of right of way was required, and a lot of the construction practices and reclamation practices fell short," says Helms.

"So, the landowners, the surface owners, got weary of the process and have been denying right of way. The state has stepped up to say, 'We want to hear about your problems; we want to take action on those and make sure they get fixed, so that we can actually get back on board with acquiring the right of way and put the pipe in the ground.'"

Like well pad science, reclamation involving pipelines has evolved over the years, too. Ron Ness, president of the North Dakota Petroleum Council says executing new ideas and procedures will continue to address the variety of issues that are still at large with reclamation and proper restoration of the land.

"We had some wet springs, and some improvements were made," says Ness.

"I think using winter installation of pipeline would be huge. It would allow us to get more pipe in the ground and stay out of the landowner's fields, in some situations.

AN ENVIRONMENT FOR ENVIRONMENTAL STEWARDSHIP

We have more work to do and I know it will be a major focus for oil and gas."

Tony Straquadine, manager of government affairs at Alliance Pipeline, believes communication, proper process and commonsense stewardship allow the oil and gas industry to lead the way in reclamation.

"We permitted out Tioga line, which is an 80-mile, 12-inch line from Tioga to Sherwood, to connect to the Alliance mainline. That's been in the ground for 14 years to Chicago," says Straquadine.

"We built the Tioga lateral specifically under Federal Energy Regulatory Commission jurisdiction, using a winter construction approach, in which we did some initial topsoil stripping in the late fall, after the crops had come off. We then came in during the winter and did the subsoil; we set that to a separate side, put our pipeline in and welded it, constructed it, and put the soil back on."

Putting the soil back on allows for additional compaction before applying the topsoil in the spring, according to Straquadine, who also says working with regulatory agencies, energy companies, landowners and policymakers can create an environment for environmental stewardship.

"The one thing Alliance follows up on is a commitment to the land," he says. "We recognize the privilege that landowners provide us to put in a pipeline as an easement. Even though we pay for that right, they continue to own the land and operate over us. But the key is the commitment."

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PROBLEMATIC PIPELINES

Justin Kringstad, director of the North Dakota Pipeline Authority, has seen the pipeline predicament first-hand. Kringstad explains how the pipeline predicament came to be in the Bakken.

“The 2007 pipes were laid based on the knowledge of old production levels. So, if a company put in an eight-inch pipeline, it’s because they were expecting one or two wells to be on a pad. Well, here we are several years later, and we are looking at eight, 12, even 16 wells on a pad, and that eight-inch pipeline is no longer going to be adequate,” says Kringstad.

“Companies have to look at their network, see where the bottlenecks are and decide what they need to do to alleviate them. Do we need new pipe? Additional pumps on the system? What steps can we take to use the existing ones, and then add additional pipelines to meet customer demand? What has changed very rapidly is the understanding of our production levels.”

Kringstad offers several more examples to explain the pipeline issues in the Bakken and how the industry plans to pacify this pipeline plight.

“Some systems may need to repurpose the pipeline from gas service to crude oil, and then add another gas line. There are several different scenarios,” he says.

“But the infrastructure that was put in place was based on our understanding several years ago, and going forward it is going to continue to evolve. That is one of the biggest ongoing challenges of right-sizing the pipeline system. When you put pipe in the ground and build a pipeline, you don’t want it to be oversized and you don’t want it to be undersized; you want it to be sized correctly. You want it right-sized.”

RESTORING RELATIONSHIPS

Ness has been working with the industry and landowners, and overall, he thinks the oil and gas companies’ commitment to reclamation isn’t just lip service; that their practices are on point, with a couple of exceptions.

He says there have been numerous changes to regulations, hotlines have been added, capital investments have been made, as have other additions, in attempt to help restore any damaged relationships.

“I believe reclamation is one of the key topics (in the Bakken) today,” says Ness. “In terms of landowners, there was a period where we rushed through with subcontractors and just didn’t do a good job, and we have essentially paid for it in the field. You have to go back out there and restore those relationships. But overall, we do a good job of reclamation in the Bakken.”

GET TO KNOW OUR EXPERTS JASON SPIESS

Jason Spiess is an award-winning journalist, talk show host, publisher and executive producer. Spiess has worked in the radio and print industry for over 25 years. For all but three years of his professional experience, Spiess was involved in the overall operations of the business as a principal partner. Spiess is a North Dakota native, Fargo North alumni and graduate of North Dakota State University.

Currently, Spiess is the chairman and executive producer of The Crude Life, a multimedia content and distribution company. On the radio, Spiess produces and hosts newsmagazine programs for 35 radio stations, including *Building the Bakken*, *The MonDak OilField Review*, *Coffee & Capitalism* and *The Texas OilField Review*.

In print, Spiess has contributed to 23 newspapers and magazines focusing on energy, technology, business and agriculture. Additionally, he is featured on Stackstreet.com, Examiner.com and podcast sites like iTunes and Podomatic.

For more information on Spiess, you can email jason@thecrudelife.com or visit www.thecrudelife.com.

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Crude Move by OPEC Doesn't Phase the Bakken

By Andrea Danelak

Plummeting oil prices are some of the most talked-about news topics as of late. By late 2014, worldwide oil supplies were much higher than demand and, in turn, prices started dropping and have continued to descend. Barrels that once fetched around \$100 are now selling for less than \$60.

The world's largest oil cartel, the Organization of the Petroleum Exporting Countries (OPEC), recently made the decision not to scale back on production, a move that has met its fair share of criticism, due to the potential implications on the U.S. oil boom. While overall, most experts are not worried about the future of production in the Bakken shale formations, North Dakota has not come out of the situation completely unscathed.

"First and foremost, there has been a dip in pace," says Alison Ritter, spokesperson for North Dakota's Department of Mineral Resources. "We have typically been running an average of 195 rigs, and OPEC's decision has further lowered oil prices. With prices dropping like they have been, it has had an impact on companies' spending and their budgets, which means lower rig counts—and that means fewer jobs and less rig activity."

The Department of Mineral Resources predicts that the majority of drilling in North Dakota will shift to four core counties: Williams, McKenzie, Dunn and Mountrail counties. "Drilling will still be fairly active in those counties. So yes, we will lose

The world's largest oil cartel, the Organization of the Petroleum Exporting Countries (OPEC), recently made the decision not to scale back on production, a move that has met its fair share of criticism, due to the potential implications on the U.S. oil boom.

GET TO KNOW OUR EXPERTS

ALISON RITTER



Alison Ritter joined the North Dakota Department of Mineral Resources in 2011 as the public information specialist after five years of work at KFYZ-TV in Bismarck, ND. While at KRYR, she was a two-time winner of the Northwest Broadcast News Association's Eric Sevareid award. Alison is a 2006 graduate of South Dakota State University, where she majored in Communications.

When she is not busy trying to keep up with the ever-changing oil and gas industry, she is busy trying to keep up with her husband Bryce, and their two sons, Boedy and Benson.

"I love the additional perspective I can provide to our decision-makers and I enjoy the different challenges my job presents every single day. I literally leave work every day thinking, 'Wow, that was tough, but it was fun!'"

rigs, but they'll move out of the fringe areas into the core counties," she says.

As for how many jobs will be affected in North Dakota, Ritter says it's hard to pinpoint an exact number. "The only way to really measure how this affects job counts is by looking at the amount of rigs that we lose," she says. "Our lowest projection is 120 rigs (down from 195) but that's a very, very low estimate—140 is probably more realistic."

There is a positive side to the slower pace, she adds, thanks to the significant growth many areas have faced during the oil boom.

"A lot of our communities are still behind, in terms of building infrastructure and housing, so this little dip in activity gives them a chance to catch up," she says.

"Some of these communities are ready for a bit of a break, whatever that break may be."

Though OPEC's decision has been seen by some as an attempt to end the U.S. shale boom by driving down oil prices, there is still a long way to go before oil companies in the Bakken fail to show a profit.

"In North Dakota, the statewide breakeven point is about \$33 per barrel, but that's a weighted average," explains Ritter. "New drilling is very geology-specific. There are certain counties that will experience higher breakeven prices and there will be some that will experience lower."

For example, as of mid-January 2015, Dunn County's breakeven average sat at \$28, while Burk County saw an average of \$61.

Ritter expects that oil prices will rise to their former levels again, though it may take some time.

"This is a very small blip in a very, very large picture," she says. "Even if prices remain

low, two or three years is not a large amount of time, given that we anticipate drilling to last 20 to 25 years."

And if prices do rise, Ritter hopes they stabilize somewhere in the middle of the former highs and recent lows.

"It can be very difficult to maintain the cost of living and completion crews, as well as all of the other costs associated with drillings, when you have \$120 barrels of oil," she says. "We have to keep production up and running and we need to keep all of the associated costs in range."

Indeed, while many initially speculated that oil-producing areas in the U.S. would be hit hard by the dropping prices, Ritter says the Bakken is still looking at a healthy long-term outlook.

"The resources and companies here have a great formula for extracting the oil, and they have a lot invested in this state," she says. "They're definitely not going anywhere." 

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Aquatech Energy Services: Providing Sustainable, Cost-Effective Solutions for Oil Producers

By Drew Kozub

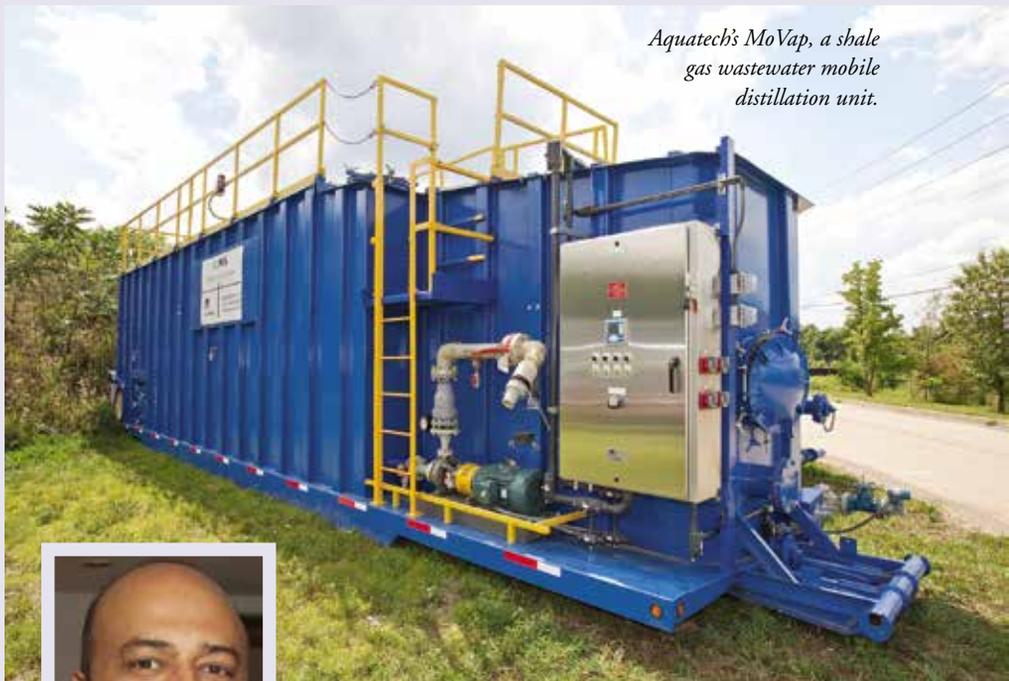
The scarcity of water can be a major issue for shale formation drilling. Mining companies in North Dakota depend on a stringent water recovery process to make sure they are minimizing downtime and maximizing production. Managing this precious resource can be stressful, so many companies around the world—and right here, in North Dakota—are relying on the experience and expertise of Aquatech Energy Services for a reliable, safe and sustainable solution to this on-going issue.

Aquatech has been operating for almost 35 years. From its head office in Canonsburg, PA, the company directs the actions of approximately 700 employees around the globe, including for several who are available to work from regional production sites in North Dakota.

The company provides mobile, modular and fixed tools to help maximize resources for companies using its services and technology. Aquatech can manage and treat waste coming from flowback, drill fluids, production brine and more, and offers a variety of cost-effective water reuse, treatment and management options.

At the head of the company's shale gas division is Devesh Mittal, who has worked in the water and wastewater treatment industry for 25 years, 19 of which were with Aquatech. In this time, he has worked as a field service engineer, application engineer, sales manager, and director of sales, before becoming the vice-president and general manager of the shale gas division at Aquatech Energy Services.

Through these various roles, Mittal understands the pressure and production costs for mining companies working in North Dakota. Mittal sees his company's membership with the North Dakota Association of Oil & Gas Producing Counties (NDAOGPC) as a great platform to connect and share ideas, in order to help companies find ways to reduce the pressure and costs on their job sites.



Aquatech's MoVap, a shale gas wastewater mobile distillation unit.



Devesh Mittal.



Aquatech's MoTreat, a suspended solids separation, filtration and disinfection unit.

“At the end of the day, mining companies want to be able to focus on their core operations: exploration and production of energy while reducing their dollars spent on water management.”

“The sustainability and cost-effectiveness of our solutions are of particular interest to oil producers, and we are looking for the NDAOGPC to help us create interaction with the oil producers facing water management challenges,” says Mittal. “The NDAOGPC offers the right forum to have these discussions with their membership, to enable continued production of energy from the region. In a declining oil price environment, Aquatech’s solutions, which enable producers to improve production cost-efficiencies and reduce cost of water management, are critical to the sustainability of operations.”

At the end of the day, mining companies want to be able to focus on their core operations: exploration and production of energy, while reducing dollars spent on water management. Aquatech has a variety of specializations and customized services that can be tailored to a particular job site. Mittal says the company wants to provide the tools that will allow customers to do their work in the best way possible.

“We take the pain away from managing the water by bringing reliable, sustainable, adaptable, safe and cost-effective technology-driven solutions to the customer,” says Mittal. “Due to our elaborate technology portfolio, we are able to develop full-scale solutions for the customer, which further substantiates our ability to deliver service-based solutions.”

These solutions can include innovative ways to make sure there is plenty of source water on a jobsite. This water can be generated from recycling production brine, treating secondary water from city sewage treatment facilities or many other secondary sources.

The biggest benefit for companies that want to do things as efficiently as possible is Aquatech’s ability to use its integrated treatment technology and full-service envelope to deliver these resources directly at the well pad, satellite location, or central facility, depending on the needs of the oil and gas producer. Mittal says operating these assets directly on, or very close to, the well pad has many valuable benefits.

“The advantage of [being close to the well pad] is that it cuts down trucking of both flowback and production brine significantly, allowing the customer to gain cost-effectiveness in managing their water, while claiming eco-consciousness by reducing truck traffic,” says Mittal.

“This is a win-win for both the oil and gas producer and the public, as it addresses their concerns and the environment. Our mobile treatment unit-based solutions that can get close to the well are very exciting; they are seeing significant market pull, due to the elegance of the water management solution.”

Through mobile water treatment and management assets, Aquatech Energy Services is able to offer a full menu of services to oil and gas producers in North Dakota.

The company’s extensive capabilities provide a variety of options for tackling water scarcity and wastewater recycling issues, ensuring customers have complete and permanent solutions for their operations. 

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TRIVIA TIME

THE OIL AND GAS INDUSTRY'S MOST POWERFUL WOMEN

Each year, the Oil and Gas Diversity Council publishes a list of the 50 most powerful women in the industry. And now, in no particular order, here are the 2015 winners.

1. Deborah G. Adams, Phillips 66
2. Eileen Gallagher Akerson, KBR, Inc.
3. Sue Alberti, Devon Energy Corp.
4. Laurie H. Argo, Enterprise Products Partners LP
5. Lydia I. Beebe, Chevron Corp.
6. Terry B. Bonno, Transocean Ltd.
7. Beth Bowman, Shell Energy North America
8. Ursula M. Burns, Exxon Mobil Corp.
9. Lynne Johnson Carrithers, Aera Energy LLC
10. Kim Clarke, Key Energy Services
11. Kimberly Allen Dang, Kinder Morgan
12. Shelby DeZell, Hilcorp Energy Co.
13. Julie Dill, Spectra Energy Corp.
14. M. Cathy Douglas, Anadarko Petroleum Corp.
15. Robyn L. Ewing, Williams Companies
16. Meg Gentle, Cheniere Energy, Inc.
17. Hinda Gharbi, Schlumberger Ltd.
18. Zhanna Golodryga, Hess Corp.
19. Wendy Hallgren, Fluor Corp.
20. Kelli M. Hammock, Murphy Oil Corp.
21. Margery M. Harris, Apache Corp.
22. Vicki Hollub, Occidental Petroleum Corp.
23. Grace B. Holmes, Cameron International Corp.
24. Carla Howard, Energy Future Holdings Corp.
25. Myrtle L. Jones, Halliburton Co.

26. Janet Langford Kelly, ConocoPhillips Co.
27. Sylvia Kerrigan, Marathon Petroleum Corp.
28. Hege Kverneland, National Oilwell Varco
29. Katrina Landis, BP plc
30. Lori Johnston, Celanese Corp.
31. Kim Lubel, CST Brands, Inc.
32. Jennifer McCauley, Southwestern Energy Co.
33. Kerry McDonough, Energy XXI USA, Inc.
34. Denise C. McWatters, HollyFrontier Corp.
35. Marcia Morales-Jaffe, World Fuel Services
36. Dana O'Brien, CenterPoint Energy
37. Sallie Reiner, Entergy Texas, Inc.
38. Kimberly Ross, Baker Hughes
39. Maryann T. Seaman, FMC Technologies, Inc.

40. Whitney Shelley, Denbury Resources
41. Sharon Spurlin, Plains All American Pipeline
42. Donna Titzman, Valero LP
43. Tesla Tolliver, Chevron Pipeline Co.
44. Cathy L. Tompkins, Chesapeake Energy
45. Melanie M. Trent, Rowan Companies plc
46. Jessica Uhl, Shell Oil Co.
47. Rose Valenzuela, Camac International Corp.
48. Cynthia Warner, Tesoro Corp.
49. Candice J. Wells, LINN Energy
50. Susan M. Whalen, Greka

Source: www.oilgasdiversitycouncil.org/what-we-do/recognition/top50



To learn more about women in the oil and gas industry, read *Set Your Sights* on page 72.

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T & R Transport: Hard Work + Ingenuity + Entrepreneurial Spirit = Self-Made Success



By Drew Kozub

The oil and gas industry has been the book in which many self-made success stories are written. These stories are inked with hard work, and entrepreneurial spirit, and the heroes of these tales are the companies creating new jobs and better lives for like-minded people. Beginning with just one truck and a plan, now sitting with a fleet over 100 subcontractors and 85 employees, T&R Transport is one of these stories.

This is not a tale of overnight success or luck, but rather one of hard work and ingenuity. Ross “Chico” Eriksmoen has worked in the trucking and transport industry since 1996. His first gig in the oil and gas industry was hauling production and flowback water for SM Energy & Continental Resources, about six years ago. Since that time, his company has grown to offer a full suite of complementary transport and trucking services to mining companies. This company will continue to grow because of its deep roots and commitment to seeing prosperity in its home state.

“T&R Transport is a local, family-owned business,” says Eriksmoen. “It is owned and operated by people who were born and raised in North Dakota. As a company, we seek to maintain a position of long-term growth by monitoring alternative transportation opportunities in the oilfield and trucking industry.”

The company is most commonly hired to haul water into the Bakken, to oil rig sites and frac tank locations, but as the business has grown, customers are also making use of T&R Transport’s water filtration, Hot Shot services, and side dump and rig cutting services.

In a busy industry like oil and gas, the rush of day-to-day operations and the pressure to get things done on schedule can sometimes come at the expense of the well-being of the people who

One of T&R Transport’s winch trucks on the job.



T&R Transport started with just one truck six years ago. Above is VP of Operations Ross “Chico” Eriksmoen’s truck.





Over the years, an operation with one truck has grown to include a fleet of more than 100 subcontractors and 85 employees.

are actually doing the work. This doesn't happen with T&R Transport. The company places a massive emphasis on the well-being of its employees, which, in turn, is reflected in the quality and professionalism of their work.

"We believe our employees are our greatest asset and seek to provide a rewarding place of employment," says Eriksmoen. The company is always looking to expand its operations, which means there is always opportunity for experienced contractors to be part of a growing company that values its employees.

"The health and safety of our employees is our number-one priority," says Eriksmoen. "We take on the responsibility to train and educate our employees as best we can and provide them

with the safest environment possible in the oil field. We care about our employees, and want to keep them safe because of the high potential for danger within the oilfields of North Dakota."

When it comes to keeping a pulse on the industry, T&R Transport looks to the North Dakota Association of Oil & Gas Producing Counties. Eriksmoen says it is extremely valuable to have a membership with a professional association like this one, so they know there is someone looking out for the interests of companies like his on the governing and policy-making level.

"We appreciate the legislative updates and the representation in the House of Representatives and State Legislators that is provided by the

North Dakota Association of Oil & Gas Producing Counties," he says.

Between full-time employees (drivers, shop staff, office workers, etc.) and subcontractors, T&R Transport has grown to a workforce of almost 200, which is very impressive, considering just over six years ago, the company launched with just one truck. T&R Transport works throughout the Bakken, with its main office and shop located in Crosby, ND, and a truck yard in Williston, ND.

Providing freshwater transport, oil skimming/recovery for pit reclamation, flat-bed and pipe hauling, water filtration, disposal, and more, T&R Transport has driven its locally-owned-and-operated company into a position of dependability for companies working in the oil and gas fields of North Dakota. 

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- Loss of work time due to unsafe work surface
- Delays in Drilling
- Unable to access due to bad weather
- Wasting unnecessary amounts of rock
- Unnecessary extra cost

MAT DRILL SITE

Advantages

- No reclamation cost
- Reduce the environmental impact
- Reduce the amount of rock on native farm lands
- Minimize unnecessary accidents
- Mats provide a safe and stable work surface
- 24/7 all-weather access with no down time
- Potential to drill one to two more additional wells per year
- Reduce the amount of truck traffic on roads
- No additional cost

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Regional Roundup

LOW OIL PRICES HAVE YET TO RATTLE SMALL BUSINESSES

Even as plunging crude oil prices fuel anxiety in North Dakota, small business owners are confident that demand for their products and services will remain strong.

Small businesses employ three-fifths of the state's private workforce, with food service and construction among the larger employers, according to the U.S. Small Business Administration (SBA).

New coffee shops, restaurants and health food stores have recently opened, or are set to open, in Williston, the capital of the state's oil boom.

While layoffs are happening at companies both large and small, more than 2,000 jobs are still waiting to be filled. The number of job openings shows the labor market remains tight.

"I'm not worried about oil prices at all," says Chris Duell, a Little Caesars franchisee who plans to open by April 2015, if his contractor can get enough staff to finish renovations. "Pizza sells, no matter what."

LEGISLATORS REVISE REVENUE FORECASTS

Republican majority leaders in the North Dakota Senate and House released revised forecasts for the remainder of the 2013-2015 biennium and the 2015-2017 biennium.

State tax collections during the upcoming 2015-2017 biennium are expected to be the second highest in state history, despite the drop in crude oil prices that forced legislators to review the projected tax revenue.

The revised general fund projections for the 2013-2015 biennium show total revenue at \$5.65 billion, which is a \$130 million reduction from the December forecast. The projected general fund ending balance has grown from \$87 million from last session to \$562 million today.

The current biennium projection for oil and gas tax revenue is \$6 billion, which is an \$800 million reduction from the December forecast.



OIL RULES MAY HAVE LIMITED DISASTER

The oil train derailment and resulting explosion in West Virginia are likely to heighten scrutiny of new regulations pending in North Dakota, where the oil was produced. The new regulations are aimed at reducing the chance of such disasters.

State officials say most produced oil is already treated in some way, though not necessarily to the level required by the new rules, which environmentalists say are not tough enough.

Oil from North Dakota's Bakken shale formation has been described as more potent than oil extracted from other shale formations, due to unusually high concentrations of ethane, propane and other natural gas liquids (NGL).

Recognizing that potency, Gov. Jack Dalrymple and state regulators decided to require that the more than 1.2 million barrels of oil produced daily in the state be filtered for NGLs starting April 1, 2015.

\$10 MILLION FOR EMERGING TECHNOLOGY

As the United States aims at reducing its carbon dioxide (CO₂) emissions, representatives of the Lignite Energy Council (LEC) have been talking with legislators and the North Dakota Industrial Commission about what can be done locally.

One of the most important bills for the LEC in the 2015 Legislature is HB 1014, an appropriations bill to fund the North Dakota Industrial Commission. Contained in the bill is also money for the Lignite Research and Development program, a joint venture between the state and the lignite industry.

This year's request for funds includes a one-time appropriation of \$10 million from the state's general fund to support research and development of promising carbon capture technology.

LEC President and CEO Jason Bohrer says CO₂ is the largest barrier to building a new lignite-based facility in the state. However, he notes, that it is not the only challenge facing the industry.

The lignite research and development program is also addressing regional haze, nitrogen oxides and other issues.

HESS STILL KEEN ON THE BAKKEN

The value of the prize hidden in the earth will keep the Bakken boom going for years, according to Stephen McNally, North Dakota general manager for Hess Corp.

He says Hess would have reduced its rig count, even without the drop in oil prices because the company has become more efficient in the extraction process.

It invested \$2 billion last year in the Bakken, and plans to invest another \$1.8 billion this year.

"The bottom line is that we are investing in infrastructure, so we will be prepared as the oil prices go back up. We are going to be able to ramp up very, very quickly," says McNally.

"We hope the state continues with investment in infrastructure, just like we are doing. We are spending almost \$2 billion. We are putting our money where our mouth is."



BILL 2103 PASSED

Gov. Jack Dalrymple signed into law Senate Bill 2103, making \$1.1 billion in state funding immediately available for infrastructure projects and other critical needs, primarily in North Dakota's oil producing regions.

Legislative leaders fast tracked the bill and included in the bill's language an emergency clause to make the \$1.1 billion immediately available for appropriation. Without priority action, the funding would not be available until after June 30, 2015, well into the 2015 construction season.

Senate Bill 2103 was sponsored by senators Kelly Armstrong, Nicole Poolman and David Rust, as well as representatives Scott Louser, Mike Schatz and Blair Thoreson. The House passed the amended bill 90-2. The Senate voted 46-0 to pass the funding bill. The bill's emergency clause required a two-thirds majority to pass.

Senate Bill 2103 includes:

- \$450 million for state highway improvement projects throughout oil and gas regions;
- \$240 million for the state's top 10 oil-producing counties;
- \$172 million for the cities of Williston, Watford City, Dickinson and Minot;
- \$112 million for counties outside of the state's oil production region;
- \$100 million for other cities within the top 10 oil-producing counties;
- \$16 million for townships outside of the state's oil production region; and
- \$10 million for cities within eligible counties bordering the Oil Patch.



FORMULA BILL MOVES FORWARD

The House voted to approve an amended version of House Bill 1176, known as the Formula Bill, which is the five percent gross production tax change.

There were significant changes to the bill. The most significant is that the distribution to local political subdivisions was proposed to change from 25 percent to 60 percent, and the amended version changed the distribution to 30 percent.

Other differences included changing the definition of a "hub city" and using the North Dakota Job Service oil and gas employment numbers. That is a change in how the money is distributed to the local political subdivisions, funds for school districts and funds for non-oil counties.

The obligations that the state has committed to fund certain initiatives, like the 12 percent property tax buy-down and education funding, were discussed.

Legislators from the oil and gas region have worked hard to address the needs and presented the information that shows the needs, as well as many of the community leaders doing the same, during the first half of the session.

The same effort will be necessary during the second half and the North Dakota Association of Oil & Gas Producing Counties, along with community leaders and legislators, will be working to find solutions that can both meet the needs and secure the votes to pass the bill.

The association and western legislators continue to talk to other legislators and leaders about the needs in the oil and gas region and the need to have a change in the formula for appropriate funds. This can provide long-term stability to the funding for proper planning.

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UNIFORM COUNTY RESTRICTED ROAD EPERMIT

The North Dakota Uniform County Truck Permit System implemented a Uniform County Restricted Road ePermit.

It is required to drive heavy trucks on any participating oil county roads and will be used for restricted county roads during the spring frost law period, and for county roads outside of the spring frost law period going forward.

The ePermit was requested by the industry to help with compliance and clarity when requesting to travel overweight on load-restricted county roads in oil producing counties.

It will allow the requestor to use the system to electronically request to drive overweight on load-restricted county roads, rather than going to each individual county for approval.



UPCOMING EVENTS

April 28 to 30, 2015

The 23rd Williston Basin Petroleum Conference will be held at Evraz Place in Regina, Saskatchewan, Canada. Registration is open.

Next year's event will be held in Bismarck, ND, May 24 to 26. Registration will open in January 2016.

www.wbpc.ca

May 19, 2015

The North Dakota Lignite Research Council meeting will be held at the Ramada Bismarck Hotel in Bismarck, ND.

www.nd.gov/ndic/lrc-infopage.htm

July 14, 2015

The 7th annual Bakken Rocks! CookFest will take place in Alexander, ND.

www.ndoil.org/events/bakken_rocks_cookfest

July 16, 2015

The 7th annual Bakken Rocks! CookFest will take place in South Heart, ND.

www.ndoil.org/events/bakken_rocks_cookfest

September 21 to 23, 2015

The 2015 North Dakota Petroleum Council Annual General Meeting will be held at the Ramada Plaza in Fargo, ND.

www.ndoil.org/events/annualmeeting

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TRIVIA TIME

GET FIT IN THE OFFICE

Looking to tone up, but don't have time to hit the gym? Here are some great exercises you can try in the office to work out, while you work away.

- 1. The Twinkle Toe:** Tap into your inner Fred Astaire by speedily tapping those toes on the floor under your desk. Or graduate to a harder (and less inconspicuous) move: Stand in front of a small trashcan and lift those legs to tap your toes on its edge, alternating feet, in soccer-drill fashion.
- 2. The Stair Master:** Want to avoid elevator small talk in favor of elevating your heart rate? Take the stairs! Accelerate on the straight-aways. Take two at a time every other flight for a real leg burn.
- 3. The Slog and Jog:** Instead of slogging away for hours nonstop, take a mini-break for a stationary jog. Pop up from your chair and jog in place. Willing to huff and puff a little more? Pick up those knees! Continue for one minute, return to spreadsheets, and repeat.
- 4. The Celebratory Split Squat Jumps:** Win over a new client? Figure out how to unjam the printer? Is it *finally* Friday? Celebrate with the split squat jump. With feet hip-width apart, step the left leg back two feet and balance on the ball of the foot. Lower into a lunge and accelerate upwards in an explosion of celebration. While in the air, switch feet, so the left foot is planted firmly in front and the right leg is behind. Repeat 10-12 times on each side.
- 5. The Cubicle Wanderer:** Walking during work is totally underrated. Stroll down the hall to catch up with co-workers or welcome a new employee. Instead of dialing extensions and sending lazy emails to the manager two doors down, put in some face time.
- 6. The Mover and Shaker:** There is nothing wrong with a brief freakout session. Release stress and spark some energy with a quick bout of seated dancing when no one is looking! Salsa anyone?
- 7. The Wall (Street) Sit:** Standing with your back against the wall, bend the knees and slide your back down the wall until the thighs are parallel to the floor. Sit and hold for 30-60 seconds, while browsing the *Wall Street Journal* (or the latest issue of *Basin Bits*). For an extra burn, cross the right ankle over the left knee, hold for 15 seconds, then switch.
- 8. The Last Man Standing:** Standing is not traditional exercise, but research shows long periods of sitting are linked to increased risk for diabetes, obesity and cardiovascular disease. Standing significantly increases your daily caloric expenditure. Stand whenever you can and convince co-workers to have standing meetings.
- 9. The Patient Printer:** The boss just requested a 200-page presentation be printed "perfectly." Why not use this time by the printer to sculpt your calves with calf raises? Standing with feet shoulder-width apart, press up onto the tippy toes, pause at the top, then, lower back down. Repeat for three sets of 12-15 reps or until the printing, faxing or scanning is done.
- 10. The Silent Seat Squeeze:** Some deskercises can be kept under wraps. To start toning, simply squeeze the buttocks, hold for five to 10 seconds and release. Repeat until the agenda wraps up or the glutes tire. The results will be uplifting.

Source: www.greatist.com/fitness/deskercise-33-ways-exercise-work

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Tools of the Trade



Drill Right's Glaive software at work.

GLAIVE SOFTWARE PROVIDES MORE THAN DIRECTIONS FOR DRILLING

Drill Right, an Oklahoma-based oilfield services company, is making directional drilling even more accurate. One of the most comprehensive systems used to track data is the highly specialized directional drilling Glaive software developed by Drill Right Technology. The software provides information about drilling projects to anyone, anywhere with Internet access.

The Glaive software syncs with all of the directional drilling tools provided by Drill Right. However, it goes well beyond just tracking the drill's pathway. It also provides daily activity reports that can include billing, daily bottom hole assembly components, inventory of the rig's collars, drill pipe types and mud pumps. It even stores the phone numbers of team members and daily weather reports from the rig site.

Having access to various types of information from a rig all in one place can help a team analyze data retrieved from the rig site to figure out the "why" behind the numbers. Having this data available helps teams look in the past to make future decisions about when, where and how to drill. The resulting product provides a wealth of information.

"We track trucking companies hauling tools to the location, packing lists as tools are used and returned to inventory, rig directions, surveys, slide and rotate footage, and it will even show how the actual drilling is progressing compared to the original plan. Glaive enables anyone with approved access to log in and view live data."

Glaive software, in conjunction with Drill Right's other tools, provides not only drillers, but engineers, accountants, suppliers and others easy access to all the data about a rig's operations. It is a huge time-saver.

bcondit@allcapcorp.com

HALLIBURTON INTRODUCES COREVAULT™ SYSTEM

Halliburton's Wireline & Perforating business line introduced the CoreVault™ system, a unique solution that provides a more accurate volumetric picture of the amount of oil and gas trapped in unconventional reservoir rocks. The system allows operators to contain and bring the reservoir fluids within rock samples to the surface, allowing for measurement of the volume of hydrocarbons-in-place.

Prior to the development of the CoreVault system, when coring tools were used to bring samples to the surface, 50 to 70 percent of the hydrocarbons escaped from the rock as the samples depressurized.

Building a model of the volume of oil and gas in a reservoir required operators to estimate this fluid loss rather than measure the fluids in place, and estimates were often inaccurate. By preserving 100 percent of the fluids within the core sample, the CoreVault system allows for an improved understanding of potential production within the reservoir.

The CoreVault system builds on the capabilities and reliability of the Halliburton Hostile Rotary Sidewall Coring Tool (HRSCCT-B™) that recovers 1.5-inch-OD cores at temperatures up to 400° F and pressures up to 25,000 psi. The CoreVault system, when combined with the HRSCCT-B tool, allows up to 10 cores to be sealed at reservoir conditions in a single wireline run, saving time over full-hole coring and allowing more targeted samples to be taken.

Samples taken with the CoreVault system often reveal dramatically more oil and gas in place than previous estimates. The information obtained can enhance economic value and reduce exploration and development risk.

An operator in Ohio and West Virginia used the system to retrieve 150 samples in five wells, with measurements of the samples showing 2.5 times more oil and gas in place than had been previously estimated.

www.halliburton.com

ATLAS COPCO QAC 1200 GENERATORS SUPPLY ONE MEGAWATT PREDICTABLE POWER

Atlas Copco QAC 1200 generators produce one megawatt of predictable power. They can be used in prime power or critical standby applications. Operators can parallel as many as 16 QAC 1200 generators for greater dependability, versatility and reduced fuel consumption.

The generators feature plug-and-play technology, allowing users to connect units with a single cable, connect the power cables to a common bus, and set desired parameters. They automatically synchronize, enabling units to power themselves down or up, depending on load requirement, which saves fuel.

Paralleled QAC 1200s provide more dependable power than multi-megawatt generators. Running paralleled, multiple one-megawatt generators keeps power supplied to tools and machinery, even if one unit goes offline.

Atlas Copco engineers the QAC 1200 into custom, 20-foot enclosures with the same footprint and form factor as ISO containers. The enclosure helps minimize engine noise to 75 dBA at 23 feet, which is ideal for sound-sensitive applications near hospitals, museums and schools.

The QAC 1200 features a Cummins QST30G5 diesel engine, which is EPA Tier 2 certified and provides 1158 kVA/926 kW prime power rating (60 Hz). With this fuel-efficient, electronically-governed engine, the integrated fuel tank provides a minimum runtime of eight hours.

Engine fluids are plumbed to the edge of the skid on the QAC 1200 to eliminate maneuvering pans into the interior space. The standard, spillage-free base frame is sized to contain 110 percent of the machine's fluids and fuel, safeguarding the site and protecting the environment.

Atlas Copco offers optional cold-weather packages for the QAC 1200 generators. They include alternator heaters, coolant heaters and battery chargers.

www.atlascopco.com



Atlas Copco's QAC 1200 generator.

NORTH AMERICA'S FIRST VANADIUM FLOW ENERGY STORAGE SYSTEM

American Vanadium has announced that the United States Department of Energy's National Renewable Energy Laboratory (NREL) is commissioning the first CellCube Vanadium flow energy storage system to arrive in North America. While there are more than 65 CellCube systems commercially installed globally, this will be the first to be showcased in North America.



Vanadium's CellCube system.

Located in Colorado, NREL is providing its new, state-of-the-art Energy Systems Integration Facility (ESIF) to independently test the CellCube for renewable integration, microgrid and utility scale applications in North America. It will provide an independent report on the technical characteristics of the CellCube energy storage system, which American Vanadium will make available to interested parties.

American Vanadium is inviting utilities, renewable energy project developers, industrial microgrid customers and media to visit NREL to view the CellCube system in operation and to further understand its capabilities. Parties interested in viewing the CellCube at NREL are invited to email the company at sales@americanvanadium.com for an appointment.

"We are very excited about independently showcasing our commercially available energy storage systems at such a leading-edge facility as NREL in Colorado," says Bill Radvak, president and CEO of American Vanadium.

"With our ability to provide reliable, long-duration energy storage systems coupled with long-term financial packages, we are now in a position to enable our partners to submit the most competitive bids."

"The ESIF is a megawatt-scale facility that provides industry users with the ability to minimize the risk and accelerate the impact of new technologies and help move them into the market faster," says Dr. Martha Symko-Davies, director of partnerships, Energy Integration, at the National Renewable Energy Laboratory in Golden, Colo. "The ability to demonstrate and evaluate technologies that can help integrate renewables into the grid is where the ESIF has an extremely important role for the evaluation of the CellCube."

www.vorticom.com

WAUKESHA BEARINGS® INTRODUCES TILT PAD THRUST BEARINGS

At Pump & Turbomachinery Symposia, Waukesha Bearings® featured its new Hidrax™ HT thrust bearing for high-temperature electric submersible pumps (ESPs). The Hidrax HT tilt pad thrust bearing can sustain unit loads of eight MPa (1160 psi) at oil bath temperatures up to 572° F.

Technological advances in steam-assisted gravity drainage (SAGD) are increasing ESP operating temperatures and placing increased demands on the thrust bearings located in the motor seal/protector section of the ESP string.

"Waukesha Bearings is staying ahead of industry needs through our continual investment in research and development," explains chief engineer Barry Blair. "With this high-temperature tilt pad thrust bearing, we are building on more than 30 years of experience in advanced materials development, testing and implementation."

The Hidrax HT bearing is a drop-in replacement option for equipment requiring increased load capacity at high temperatures. The bearing is available in sizes up to eight inches, with center or offset pivot designs. Given the hardness of the Hidrax HT bearing surface, the rotating thrust collar surface must be hard as well. Waukesha Bearings can supply an appropriate thrust collar that is designed to work well with the Hidrax HT bearing.

The Hidrax tilt pad thrust bearing platform is well-proven with polymer surfaces, with 200,000 supplied to date. Polymer Hidrax bearings have a rated unit load of eight MPa (1160 psi) and oil bath temperature of 392° F.

www.waukeshabearings.com



Hidrax™ HT thrust bearing for high-temperature electric submersible pumps.

MAPTEK ADDS EVORELUTION TO PRODUCT SUITE

Maptek Ltd. and Orelogy Group Ltd. announced they have signed an agreement for Maptek to acquire the suite of Evorelution products from Orelogy.

Maptek will deliver the advanced strategic mine scheduling optimisation capabilities within Evorelution to the global mining industry, augmenting geological modelling and mine design functionality in Vulcan software.

Orelogy will continue to offer specialist mine planning services to customers globally and will apply Evorelution and Vulcan in their consulting work.

Evorelution is an open pit mine scheduling solution that maximizes value by delivering practical, high-value schedules more cost effectively and up to 10 times faster than other methods.

"Orelogy has created a next generation scheduling and optimization solution in Evorelution," comments Maptek general manager Peter Johnson. "Maptek is pleased to partner with them."

Orelogy has developed and delivered Evorelution successfully from their Perth head office for several years.

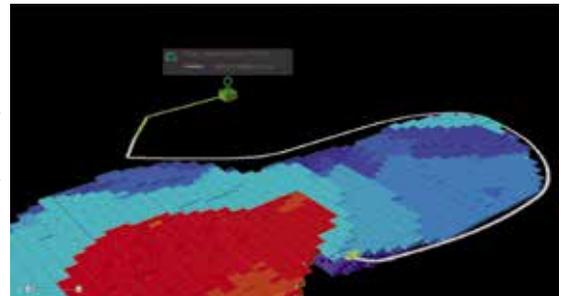
"Maptek has validated our belief that we have a world-class scheduling solution," comments managing director for Orelogy, Steve Craig.

"Maptek also welcomes key staff responsible for developing Evorelution," adds Johnson. "They will add a new dimension to our strategic solutions, along with expertise to support customers globally."

Technology company advisor Atrico Pty Ltd. advised Orelogy on this transaction.

The terms of the agreement are confidential. To discuss how Maptek solutions can benefit your mining operation, contact Maptek at +61-8-8338-9222.

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THE TOP 50 BAKKEN

The following are the top 50 oil and gas producers in North Dakota as of February 2015. The list, which shows the cumulative amount of oil and gas that the 50 companies have produced in North Dakota in 2014, was provided by the North Dakota Department of Mineral Resources in February 2015. This list also reflects how many wells were in production for each of these top producers during that time.

As of mid-February 2015, there are 137 active rigs drilling in the North Dakota oil patch, according to the North Dakota Oil & Gas Division of the North Dakota Department of Mineral Resources. This number is down from 188 rigs in November, and the biggest factor in this drop is falling oil prices. The statewide rig count is down 37 percent from its all-time high of 218 in May of 2012, and in the five most active counties, the rig count is down as follows:

1. Divide: Down 62 percent from its high in March 2013;
2. Dunn: Down 45 percent from its high in June 2012;
3. McKenzie: Down 28 percent from its high in January 2014;
4. Mountrail: Down 41 percent from its high in June 2011; and
5. Williams: Down 40 percent from its high in November 2014.

The number of producing wells in North Dakota, as of December 2014 is 12,124—a new, all-time high. Over 95 percent of drilling still targets the Bakken and Three Forks formations. Last April, North Dakota reached the milestone of producing one million barrels of oil per day, an achievement only completed by four other states—Alaska, California, Louisiana and Texas—and only 22 other countries in the world. The state is currently sitting as number two in oil production in the nation, with the number one spot belonging to Texas.

- | | | |
|---|--|--|
| <p>1. Whiting Oil & Gas Corp.
Oil production (2014): 48,386,133 bbls
Gas production (2014): 60,470,443 mcf
Wells in production (2014): 1,166
Tel: (303) 837-1661
Fax: (303) 861-4023
Web: www.whiting.com</p> | <p>4. EOG Resources, Inc.
Oil production (2014): 29,120,881 bbls
Gas production (2014): 26,631,936 mcf
Wells in production (2014): 565
Tel: (713) 651-7000
Toll-Free: (877) 363-3647 (EOGR)
Web: www.eogresources.com</p> | <p>8. Oasis Petroleum North America, LLC
Oil production (2014): 19,102,276 bbls
Gas production (2014): 17,805,351 mcf
Wells in production (2014): 535
Tel: (281) 404-9500
Web: www.oasispetroleum.com</p> |
| <p>2. Continental Resources, Inc.
Oil production (2014): 35,580,232 bbls
Gas production (2014): 48,879,066 mcf
Wells in production (2014): 1,057
Tel: (405) 234-9000
Toll-Free: (800) 256-8955
Killdeer: (701) 764-6582
Rhame: (701) 279-6688
Tioga: (701) 664-3001
Fax: (405) 234-9253
Web: www.contres.com</p> | <p>5. Burlington Resources Oil & Gas Co., LP
Oil production (2014): 22,196,050 bbls
Gas production (2014): 27,238,850 mcf
Wells in production (2014): 419
Tel: (432) 688-6800
Web: www.br-inc.com</p> | <p>9. Marathon Oil Co.
Oil production (2014): 19,060,686 bbls
Gas production (2014): 16,340,598 mcf
Wells in production (2014): 451
Tel: (713) 629-6600
Web: www.marathonoil.com</p> |
| <p>3. Hess Bakken Investments II, LLC
Oil production (2014): 32,668,838 bbls
Gas production (2014): 45,980,163 mcf
Wells in production (2014): 947
Tel: (713) 496-4000
Web: www.hess.com</p> | <p>6. XTO Energy Inc.
Oil production (2014): 20,655,958 bbls
Gas production (2014): 29,155,580 mcf
Wells in production (2014): 590
Tel: (817) 870-2800
Toll-Free: (800) 299-2800
Fax: (817) 870-1671
Web: www.xtoenergy.com</p> | <p>10. QEP Energy Co.
Oil production (2014): 16,536,863 bbls
Gas production (2014): 18,767,313 mcf
Wells in production (2014): 232
Tel: (303) 672-6900
Web: www.qepres.com</p> |
| | <p>7. Statoil Oil & Gas, LP
Oil production (2014): 19,243,478 bbls
Gas production (2014): 22,215,141 mcf
Wells in production (2014): 476
Tel: (512) 427-3300
Web: www.statoil.com</p> | <p>11. HRC Operating, LLC
Oil production (2014): 13,390,677 bbls
Gas production (2014): 13,628,835 mcf
Wells in production (2014): 216
Tel: (832) 538-0300
Web: www.halconresources.com</p> |

- 12. WPX Energy Williston, LLC**
Oil production (2014): 11,546,940 bbls
Gas production (2014): 9,687,744 mcf
Wells in production (2014): 179
Tel: (701) 837-2900
Web: www.wpxenergy.com
- 13. Slawson Exploration Co., Inc.**
Oil production (2014): 10,020,713 bbls
Gas production (2014): 7,668,604 mcf
Wells in production (2014): 250
Tel: (316) 263-3201
Fax: (316) 268-0702
Web: www.slawsoncompanies.com/exploration.html
- 14. SM Energy Co.**
Oil production (2014): 9,389,612 bbls
Gas production (2014): 12,199,258 mcf
Wells in production (2014): 291
Tel: (406) 245-6248
Web: www.sm-energy.com
- 15. Petro-Hunt, LLC**
Oil production (2014): 8,574,028 bbls
Gas production (2014): 12,942,262 mcf
Wells in production (2014): 184
Tel: (214) 880-8400
New Town: (701) 675-2467
Killdeer: (701) 863-6622
McGregor (Tioga): (701) 546-4601
Web: www.petro-hunt.com
- 16. Oxy USA Inc.**
Oil production (2014): 7,596,940 bbls
Gas production (2014): 3,085,454 mcf
Wells in production (2014): 272
Tel: (713) 215-7000
Web: www.oxy.com
- 17. Newfield Production Co.**
Oil production (2014): 7,581,160 bbls
Gas production (2014): 14,322,795 mcf
Wells in production (2014): 175
Tel: (281) 210-5100
Fax: (281) 210-5101
Web: www.newfld.com
- 18. Enerplus Resources USA Corp.**
Oil production (2014): 5,723,753 bbls
Gas production (2014): 4,779,282 mcf
Wells in production (2014): 100
Tel: (701) 675-2135
Web: www.enerplus.com
- 19. Triangle USA Petroleum Corp.**
Oil production (2014): 4,675,094 bbls
Gas production (2014): 5,277,517 mcf
Wells in production (2014): 99
Tel: (303) 260-7125
Fax: (303) 260-5080
Web: www.trianglepetroleum.com
- 20. Hunt Oil Co.**
Oil production (2014): 3,778,879 bbls
Gas production (2014): 3,047,274 mcf
Wells in production (2014): 132
Tel: (214) 978-8000
Fax: (214) 978-8888
Web: www.huntoil.com
- 21. Murex Petroleum Corp.**
Oil production (2014): 2,787,650 bbls
Gas production (2014): 2,628,529 mcf
Wells in production (2014): 100
Tel: (281) 590-3313
Fax: (281) 590-3381
Web: www.murexpetroleum.com
- 22. Fidelity Exploration & Production Co.**
Oil production (2014): 2,638,894 bbls
Gas production (2014): 2,009,280 mcf
Wells in production (2014): 91
Tel: (406) 359-7360
Web: www.fidelityepco.com
- 23. Zavanna, LLC**
Oil production (2014): 2,571,938 bbls
Gas production (2014): 2,729,589 mcf
Wells in production (2014): 74
Tel: (303) 595-8004
Fax: (303) 595-9847
Web: www.zavanna.com
- 24. Samson Resources Co.**
Oil production (2014): 2,429,119 bbls
Gas production (2014): 3,137,395 mcf
Wells in production (2014): 112
Tel: (918) 591-1791
Fax: (918) 591-1796
Web: www.samson.com
- 25. Lime Rock Resources III-A, LP**
Oil production (2014): 2,064,565 bbls
Gas production (2014): 1,083,540 mcf
Wells in production (2014): 48
Tel: (713) 292-9510
Fax: (713) 292-9560
Web: www.limerockresources.com
- 26. Emerald Oil Inc.**
Oil production (2014): 1,878,464 bbls
Gas production (2014): 2,335,867 mcf
Wells in production (2014): 69
Tel: (303) 323-0008
Web: www.emeraldoil.com
- 27. Abraxas Petroleum Corp.**
Oil production (2014): 1,476,710 bbls
Gas production (2014): 2,667,957 mcf
Wells in production (2014): 26
Tel: (210) 490-4788
Web: www.abraxaspetroleum.com
- 28. American Eagle Energy Corp.**
Oil production (2014): 1,437,072 bbls
Gas production (2014): 1,224,023 mcf
Wells in production (2014): 53
Tel: (303) 798-5235
Web: www.americaneagleenergy.com
- 29. Liberty Resources Management Company, LLC**
Oil production (2014): 1,082,619 bbls
Gas production (2014): 2,153,908 mcf
Wells in production (2014): 23
Tel: (303) 749-5757
Fax: (303) 749-5759
Web: www.libertyresourcesllc.com
- 30. Sinclair Oil & Gas Co.**
Oil production (2014): 884,445 bbls
Gas production (2014): 901,670 mcf
Wells in production (2014): 40
Tel: (801) 524-2700
Web: www.sinclairoil.com/exploration.html
- 31. Crescent Point Energy US Corp.**
Oil production (2014): 758,319 bbls
Gas production (2014): 828,136 mcf
Wells in production (2014): 31
Tel: (888) 693-0020
Web: www.crescentpointenergy.com
- 32. PetroGulf Corp.**
Oil production (2014): 436,700 bbls
Gas production (2014): 457,926 mcf
Wells in production (2014): 4
Tel: (303) 893-5400
Web: www.petrogulf.com
- 33. Arsenal Energy USA Inc.**
Oil production (2014): 405,563 bbls
Gas production (2014): 166,427 mcf
Wells in production (2014): 9
Tel: (403) 262-4854
Web: www.arsenalenergy.com
- 34. Cornerstone Natural Resources, LLC**
Oil production (2014): 361,927 bbls
Gas production (2014): 307,696 mcf
Wells in production (2014): 23
Tel: (303) 468-5860
Web: www.cornerstonenaturalresources.com
- 35. North Plains Energy, LLC**
Oil production (2014): 298,674 bbls
Gas production (2014): 242,282 mcf
Wells in production (2014): 8
Tel: (303) 800-5100
Web: www.northplainsenergy.com
- 36. Mountain Divide, LLC (a Subsidiary of Mountainview Energy)**
Oil production (2014): 297,619 bbls
Gas production (2014): 192,117 mcf
Wells in production (2014): 9
Tel: (406) 969-5590
Web: www.mountainviewenergy.com
- 37. Spotted Hawk Development (SHD) Oil & Gas, LLC**
Oil production (2014): 285,542 bbls
Gas production (2014): 339,904 mcf
Wells in production (2014): 7
Tel: (703) 286-1448

- 38. **True Oil, LLC**
Oil production (2014): 282,697 bbls
Gas production (2014): 561,167 mcf
Wells in production (2014): 10
Tel: (307) 237-9301
Web: www.truecos.com
- 39. **Thunderbird Resources, LP**
Oil production (2014): 174,108 bbls
Gas production (2014): 209,181 mcf
Wells in production (2014): 11
Tel: (405) 600-0711
Web: www.gmxresources.com
- 40. **Bakken Hunter, LLC**
Oil production (2014): 140,301 bbls
Gas production (2014): 147,795 mcf
Wells in production (2014): 10
Tel: (832) 369-6986
Web: www.magnumhunterresources.com/operations_williston.html
- 41. **Gadeco, LLC**
Oil production (2014): 55,726 bbls
Gas production (2014): 66,279 mcf
Wells in production (2014): 2
Tel: (303) 850-7490
- 42. **Windsor Energy Group, LLC**
Oil production (2014): 49,507 bbls
Gas production (2014): 25,283 mcf
Wells in production (2014): 1
Tel: (405) 848-8807
- 43. **RIM Operating Inc.**
Oil production (2014): 42,775 bbls
Gas production (2014): 26,506 mcf
Wells in production (2014): 5
Tel: (303) 799-9828
- 44. **Legacy Reserves Operating, LP**
Oil production (2014): 36,906 bbls
Gas production (2014): 40,492 mcf
Wells in production (2014): 10
Tel: (855) 534-5200
Web: www.legacyp.com
- 45. **Resource Drilling, LLC**
Oil production (2014): 32,220 bbls
Gas production (2014): 13,104 mcf
Wells in production (2014): 1
Web: www.resourcedrillingllc.com
- 46. **Texakota Inc.**
Oil production (2014): 14,174 bbls
Gas production (2014): 14,763 mcf
Wells in production (2014): 6
Tel: (713) 520-7600
Web: www.texakota.com
- 47. **Condor Petroleum Inc.**
Oil production (2014): 12,684 bbls
Gas production (2014): 7,172 mcf
Wells in production (2014): 2
Tel: (403) 201-9694
Fax: (403) 201-9607
Web: www.condorpetroleum.com
- 48. **Petro Harvester Operating Co., LLC**
Oil production (2014): 10,395 bbls
Gas production (2014): 5,473 mcf
Wells in production (2014): 2
Tel: (701) 756-6310
Web: www.petroharvester.com
- 49. **Pride Energy, an Oklahoma General Partnership**
Oil production (2014): 7,692 bbls
Gas production (2014): 4,382 mcf
Wells in production (2014): 4
Tel: (918) 524-9200
Fax: (918) 524-9292
Web: www.pride-energy.com
- 50. **Samuel Gary Jr. & Associates, Inc.**
Oil production (2014): 6,244 bbls
Gas production (2014): 2,450 mcf
Wells in production (2014): 3
Tel: (303) 831-4673
Fax: (303) 863-7285
Web: www.samgaryjr.com



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