

BAKKEN

Lab chemists play gatekeeper role at refinery

By **Dustin Monke**
The Drill Editor
DICKINSON, N.D.

In a windowless room inside of a non-descript steel building at Dakota Prairie Refining's sprawling facility west of Dickinson, there are six people whose job is to make certain America's first greenfield refinery built since 1976 turns Bakken crude oil into diesel fuel.

"It's a chem nerd's dream," laboratory technician and chemist Nicole Haller said of the lab where she works on the 375-acre refinery site.

The small lab crew — led by supervisor Holly Dalen of Dickinson — has some of the most important jobs at the refinery, which is in the final stages of testing before ramping up operations.

They already spend each day testing crude oil, diesel fuel and its sulphur levels, as well as other products to be produced by the refinery. They also run constant tests on city wastewater to be used in the refining process.

The lab crew act as the refinery's gatekeepers. If a product goes in or comes out of the refinery, the lab has its eyes and instruments on it.

Dakota Prairie Refining began receiving shipments of crude oil in December and its tanks are nearly full, plant manager Dave Podratz said. After a delay of a few months, the refinery could begin processing 20,000 barrels of oil as early as April, he said. WBI Energy, a subsidiary of Bismarck-based MDU Resources Group, developed the refinery with Indianapolis-based Calumet Specialty Products Partners LP. They broke ground in March 2013.

The lab has been preparing for that first day since last June, when Dalen was hired and the lab began coming together.

"It's a new project," said Dalen, who previously worked at Nalco Champion in Dickinson and the Dakota Gasification Co. in Beulah. "It's something that hasn't been done in a long time. ... This doesn't

happen very often, that you get to be at a facility from ground up. It's really exciting. We get to make it right the first time."

Podratz said he's confident the lab crew will be doing the job it was hired to do when the refinery begins producing fuel at its regular rate in the coming weeks.

"That's the beauty of it," Podratz said. "When we get the rest of the plant going in the next few weeks, these guys, they're ready. That's the one place I don't have to worry about. All the bugs are worked out."

Once the refinery begins operating and processing crude oil into diesel fuel and other products, at least one person will be in the lab 24 hours a day to test the oil, water and, most importantly, the diesel fuel produced in the refining process.

Podratz jokingly said that's the reason why there isn't a lock on the lab's door — "because there's always someone here."

While the lab crew likes to keep

things light and have fun, Dalen said their job is also very serious.

"On this end, if the diesel doesn't meet spec, they can't be putting it into the tank, and we can't be selling it," Dalen said.

The lab will run daily tests for sulphur levels in diesel samples that come out of the refining process and share those results with the refinery's operators.

"The process operators will actually make adjustments in the field to their process so that they hit the specifications but don't go overboard, because that costs us extra money and shortens the life of the process," Podratz said.

To make sure the lab does its job well, the refinery invested in some of the most updated equipment. While most of that equipment is more expensive than its primitive predecessors, the refinery benefits because it produces automated and accurate results, which are instantly logged into computers. It saves the

refinery on staffing, time and even cleaning solvents, Dalen said.

"It's so much cooler than the stuff I learned on in college," said Haller, adding the lab still performs manual checks to ensure its findings are accurate and within American Society for Testing and Materials specifications.

Three of the employees — including Dalen and Haller — have called southwest North Dakota home for several years. Haller grew up in the area and graduated from both Dickinson High School and Dickinson State University.

When Dalen arrived at the refinery in June, the lab was a large empty room. Piece by piece and person by person, that has changed. Now, as the days of testing come to an end and with production set to begin, she's proud of the group she works with and is anxious to start doing the job they've been assembled to do.

"People are excited," Dalen said. "They want to be here, and it's exciting to be in that environment."

Belle Fourche: The Bakken's southern exposure

BELLE FOURCHE, S.D.

There seems to be a split in conversations when discussing the energy industry these days.

One has headlines and talk shows focusing on dropping oil prices, economic recoveries and job growth. Others cite sources of overseas outsourcing numbers, inflation and lack of employment quality.

While the media and coffee talk focuses on pointing fingers and statistical numbers, the energy industry was busy jumpstarting the nation's economy by taking advantage of \$100 a barrel oil. This is an important conversation not many are having. Important because now that oil is around \$40-\$50, the next layer of the energy economy is scheduled to kick in.

Many of the Bakken mineral rights have been secured and long-term deals have been made to extract the resource. The shale play pricing and logistics created a shift in business priorities for oil and gas. Early on, energy companies were using \$100 oil to secure leases and production rights in remote areas of the Bakken. Now that prices have dropped, streamlining operations, costs and obtaining capital jump to the front of the line in priorities.

This is not an overnight process in oil and gas. It's a process that has a cycle of its own. Even if prices hit \$90 by the end of the summer, it would be almost a year before the transition would occur.

"Even if oil was back at \$90 in August, we'd be looking at July or August of 2016 before rig count really responded



Jason Spiess
For
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significantly for that," said Lynn Helms, director of North Dakota Department of Minerals Resources' Oil and Gas Division. "That's because oil companies have to raise the capital, put together their budgets, put together their drilling plans, their contracts and then go out and do the work. So it takes 11 to 12 months, even with a quick rebound, to work itself through the system and translate into a rig count."

The pricing volatility and business plan streamlining has centralized the rigs to primarily four counties — McKeen, Williams, Dunn and Mountrail, which are often referred to as the Bakken hot zones. According to Helms, 123 of the 126 rigs are in those four hot zone counties.

This sudden shift in the energy economy only ramps up the phases in a natural resource or mining cycle. The harvesting continues, albeit at a different rate than before, therefore the infrastructure and supporting cast must continue.

"They are now in the rebounding phase and the only question is how quickly that happens," Helms said.

"Is that going to be a year roughly, like happened in 2008 or 2009? Or is it going to be three years, like it hap-

pened in the late '90s? Or is it 10 years, like it happened in the 1980s?" he asked. "No one really knows, although this has more the characteristics of '08-'09 than it does of either of those earlier collapses and rebounds. We are beginning to rebound now from a significant collapse that followed almost four years of high stable oil prices."

North Dakota recently signed a "surge funding" bill to get infrastructure projects rolling in order to satisfy the growing population on the western side. This will ensure the next layer of the energy economy is played out.

The word "support" in oil and gas means several things. There's industry support impacting the locals and there's community support impacting the region.

Construction companies and those supplying the major contractors will percolate the local economies while regional communities have to react differently to the end of Big Oil's spending spree.

This is where communities like Belle Fourche become interesting prospects in the energy economy. Once considered a potential drilling location because of the Tyler formation, the agriculture

town of 5,000 is not only the geographical center of the U.S., it is the center of several major shale plays.

"The Highway 85 corridor runs through Belle Fourche does on a daily basis have over 10,500 vehicles on it a day. That's a day," said Hollie Stalder, executive director of the Belle Fourche Economic Development Corp. "About 2,500 of the 10,500 are trucks. So it is some people going back and forth either working or having shifts in the Bakken. Belle Fourche has been growing in size and interest ever since companies like Permian Tank opened."

Terry Jacobson, a Lead, S.D., native and corporate attorney for Permian Tank, said in 2013 that Belle Fourche was chosen as the location for Texas-based above-ground storage tank and processing equipment manufacturer Permian Tank & Manufacturing, Inc., because of its geographical location to support the Bakken, Niobrara and Green River oilfield activities.

Stalder hears the same thing from others who want to know more about the gateway to the northern Black Hills. She said Belle Fourche has had an advantage many

other energy impacted communities have — geography and distribution arteries.

"We are surrounded by major energy plays and we have embraced what has come out of that. It's pretty much been all very positive," Stalder said. "Because we live far enough away and are not in the thick of the Bakken and what comes with that. Good and bad."

Another reason companies are inquiring about Belle Fourche is their decision to invest into an industrial rail park, where Permian Tank set up shop. Stalder said there is more than \$3 million invested into infrastructure and the rail spur is still continuing to be developed.

"The transload and spur will serve that industrial park very well," Stalder said. "In western South Dakota and kinda this tri-state area, that's a mechanism serve not only the people in the rail park but trucking businesses all over to on load and offload product for folks that want to use the rail as a more economical way to transport their goods either in or out of our area."

Stalder said Belle Fourche is still receiving calls and inquiries from businesses looking to set up shop. She added the

recent economic study showed the vehicle number dropped by nearly half when you got north of the town.

"That tells me it isn't all oil related," Stalder said. "I would say over the past six months, 90 to 95 percent of all our inquiries we non-oil related. From retail to manufacturing to agriculture. They are across the board, they are more location related."

Stalder said there are three industries specific to oil who have settled in Belle Fourche — Permian Tank, Black Hills Fiberglass and Pipeline Plastics. Stalder added Pipeline Plastics and Black Hills Fiberglass can and do some business in the water industry, but oil is their primary customer.

"If we can benefit from any of the oil plays that surround us with businesses, industries or manufacturing or anything related to the oilfields, we'd love to be that," Stalder said. "But I appreciate that we can be diversified here and still accommodate the shale plays like the Bakken. Yet not be so narrowly focused that it is all oil related."

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