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First Quarter 2016

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See article on page 48.


ConocoPhillips

From the desk of

Joe Marushack, President, ConocoPhillips Alaska

THESE ARE CHALLENGING TIMES FOR THE OIL AND GAS INDUSTRY, with weak commodity prices and across-the-board belt tightening. We work in a boom-and-bust business, and those of us who have weathered these cycles before understand how important it is that our company be poised to emerge stronger than ever when things turn around.

This issue's cover story featuring the Alpine development on Alaska's North Slope is one shining example of ConocoPhillips' commitment to the future. Following the startup of Kuparuk drill site 2S earlier in the month, on Oct. 27, 2015, Alpine drill site CD5 celebrated its long-anticipated first oil. The first drill site in the area since 2006, CD5 is expected to increase production at Alpine for the first time in ten years, with 16,000 barrels per day gross of new oil in an area that had historically been experiencing an 8 percent production decline per year.

As the first oil development on Alaska Native lands within the boundaries of the National Petroleum Reserve-Alaska, CD5 is a state-of-the-art facility located in a remote, environmentally sensitive area. A variety of challenges were overcome by a dedicated team committed to safety and excellence. Much of the work took place during the brief windows of opportunity when ice roads offer access to remote areas on Alaska's North Slope. Over a two-year construction phase, more than 120 miles of ice roads were built; a million and a half cubic yards of materials were mined and hauled; and 32 miles of pipeline and electrical infrastructure were installed. The innovative construction of a 1,400-foot bridge spanning the Nigliq Channel of the Colville River was a crowning achievement. We are particularly proud of the partnerships and relationships with Native corporations that helped us make this a reality. All the while, the project construction team demonstrated that at ConocoPhillips, safety is more than a priority — it's a core value.

To me, the CD5 project represents what ConocoPhillips does really well all over the world — finding development opportunities, beating difficult odds with amazing perseverance, collaborating with key stakeholders to find winning solutions, planning for success and executing with confidence to exceed expectations. CD5 came online below budget and ahead of schedule, with an absolute commitment to safety. ■



EDITOR'S NOTE: Entering its tenth year of publication, *spirit Magazine* continues the tradition of delivering diverse examples of hard work, perseverance and collaboration. Between the covers of this issue, readers can travel from Alaska's North Slope to Surmont 2 in Canada's oil sands to London's Portman House, and through the many fields where compressive seismic imaging technology is poised to become an industry game changer. If you want to know more about ConocoPhillips today, read on.

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ON THE COVER On Alaska's
North Slope, Alpine's remote CD5
site is a model for sustainable
development. Environmental and
archeological studies helped guide
placement of facilities to minimize
the impact on wildlife, water
flow and the subsistence lifestyle
of residents in the neighboring
village of Nuiqsut.

PHOTO BY JUDY PATRICK





San Juan spectacular

Mesozoic stratigraphy meets the snow-capped peaks of the La Plata Mountains near Durango, Colorado — the northernmost boundary of the San Juan Basin. The pristine snowpack feeds the Animas and La Plata Rivers that form a confluence with the San Juan River in Farmington, New Mexico. The water will be vital in the coming summer months, providing a lifeline to Native peoples, farmers and ranchers living in the arid high desert of Northern New Mexico. PHOTOGRAPHY BY PATRICK CURREY

Katy Prairie Conservancy IR&C team exercise

The ConocoPhillips Investor Relations & Communications team repotted prairie tallgrass seedlings into 4" pots and trimmed dormant prairie grasses during a group exercise on Jan. 12 at the Katy Prairie Conservancy's Indiangrass Preserve, home to the organization's native seed nursery and field office.

The conservancy's mission is to preserve, protect and enhance critical and sustainable portions of the Katy Prairie ecosystem, located on Houston's far west side. The Katy Prairie comprises a variety of habitats, including agricultural wetlands, depressional wetlands, creek corridors and coastal grasslands. The Katy Prairie Conservancy owns and manages 14 preserves covering more than 13,000 acres, each with its own unique history, geology and wildlife community. Volunteers play a vital role in helping the conservancy meet its education and conservation goals. PHOTOGRAPHY BY GUS MORGAN



Restoring habitat: ConocoPhillips volunteers (above left) plant tallgrass seedlings in a 55-acre restoration area; **ABOVE RIGHT:** IR&C team members Vinnika Johnson (left) and Mary Ellen Weylandt transplant native grass seedlings to bigger pots at the conservancy's native seed nursery.

A flock of juvenile ibises takes flight on the Katy Prairie. These wading birds have long, down-curved bills and usually feed as a group, probing mud for food items such as crustaceans.



LEFT: (Clockwise from top) IR&C team members cut back dormant prairie grasses adjacent to the conservancy's native seed nursery at the Indiangrass Preserve. Cutting the grass helps stimulate spring growth and is used in areas where burning is not practical; a special garden provides milkweeds, nectar sources and shelter to migrating monarch butterflies; Daren Beaudou, director of external communications and media relations, removes native grass cuttings on a sunny January afternoon.



BELOW: The Indiangrass Preserve is home to a variety of native tall grasses, such as switchgrass, big bluestem, little bluestem and indiangrass. The coastal prairie of Texas is the southern terminus of the tall grass prairie system that extended from Canada to the Gulf of Mexico.





Postcard from London

The HMS Belfast sits permanently moored in the River Thames in front of the iconic Tower Bridge. The U.K.'s second longest river, the Thames rises in the Cotswolds in the west of England and flows 215 miles to the Atlantic Ocean. The museum ship HMS Belfast, a Royal Navy light cruiser, was launched on March 17, 1938 and played an important role in World War II and the Korean War. A joint committee successfully fought to preserve the ship, and in October 1978 she became a branch of the Imperial War Museum. PHOTOGRAPHY BY PATRICK CURREY



Achieving the impossible in Alaska



Launching the final span of
the Nigliq Channel Bridge



BY AMY BURNETT, PHOTOGRAPHY BY
CHRIS AREND & JUDY PATRICK

ALPINE DRILL SITE CD5 CELEBRATED LONG-ANTICIPATED FIRST OIL IN OCTOBER 2015.

FROM THE OUTSIDE LOOKING IN, THE SUCCESSFUL STARTUP OF CD5 10 YEARS AFTER FIRST PERMIT APPLICATIONS WERE SUBMITTED MIGHT SEEM LIKE A SMALL MIRACLE. TO THE PEOPLE INVOLVED IN MAKING THIS PLAN A REALITY, IT FEELS A LOT MORE LIKE HARD WORK, PERSEVERANCE AND COLLABORATION.



Mike Lyden, Operations Maintenance superintendent



Helene Harding, vice president, Gulf Coast business unit

BELOW: (From left) Barb Fullmer, managing counsel; Lisa Pekich, director, Village Outreach; Lynn DeGeorge, project permitting coordinator; and Jon Goltz, senior counsel

MOVING WEST

Just outside the boundary of the [National Petroleum Reserve-Alaska \(NPR-A\)](#), the first Alpine field discovery well was drilled in 1994, followed by five appraisal wells in 1995. Results were promising. By 1997 this westernmost, remote addition to the Alaskan North Slope oil fields had been funded and final engineering and design were underway.

Field construction and development took three years and six million labor-hours, cost more than \$1.3 billion dollars and will produce 16,000 barrels per day gross of new oil.

The project sprinted out of the starting gate, setting a North Slope record for cycle time from discovery to field startup in 2000. That achievement was based on the main Alpine pad, Colville Delta (CD) 1, which included the process facility, offices and most of the primary infrastructure needed to support oil development in an area accessible only by air about nine months out of the year.

By 2001, wells were being drilled at a second pad, CD2. Exploration continued and process facilities were expanded. In 2006, Alpine celebrated the startup of CD3 and CD4, and all of the planned development on the east side of the Colville River (the boundary to the NPR-A) was complete.

This is where the story of CD5, the first oil development on Alaska Native lands within the

boundaries of the NPR-A, begins.

CD5 was discovered, along with CD3 and CD4, before construction of Alpine was underway. Located on the west side of the Colville River, 6 miles from the central Alpine facility, the CD5 drill site would require more infrastructure, be

“Stakeholder relations is critical to pretty much everything we do on the North Slope of Alaska.”

— HELENE HARDING

costlier and more time consuming than its counterparts, and would be last in line for construction.

“We started permitting CD5 in the early 2000s along with CD3 and CD4,” said Project Permitting Coordinator Lynn DeGeorge, one of a handful of people who worked on CD5 from the beginning. “We put it on the shelf for a little while,

then dusted it off.”

The company knew developing the drill site would eventually become essential to sustaining production and keeping the Alpine field viable.

“Alpine is on a fairly steep production decline,” said Operations Maintenance Superintendent Mike Lyden. “CD5 will stem that decline tremendously.”

Permit applications were submitted in 2005 based



on parameters laid out in the approved 2004 Alpine development plan. CD5 was on course to follow its sister drill sites into production, but its environmentally and politically sensitive location in the NPR-A sent it down a long and circuitous path.

COMPLEX PERMITTING

Alpine is a model for sustainable development. ConocoPhillips did its homework in planning the field, spending more than eight years and millions of dollars establishing baseline conditions, documenting wildlife use in the area and evaluating potential effects of development on the flora and fauna. The environmental and archeological



studies, among other things, helped guide placement of drill sites and other facilities to minimize the development's effects on wildlife, water flow and the subsistence lifestyle of residents in the neighboring village of Nuiqsut.

Based on these extensive studies, a successful track record at Alpine and the established development standards, ConocoPhillips submitted the necessary project development permit applications in 2005 to move CD5 toward construction. Given its strong relationships with key stakeholders, the company was surprised by opposition. When they couldn't reach agreement with key stakeholders on the location of the main bridge connecting CD5 to Alpine, ConocoPhillips withdrew the applications. The company spent the



ABOVE: The village of Nuiqsut
The Nigliq Channel Bridge
"superstructure" launch
begins during the second
project construction season.



Steve Thatcher, manager, Western North Slope Operations

next several years working closely with permitting agencies and Nuiqsut residents to find common ground.

“Stakeholder relations is critical to pretty much everything we do on the North Slope of Alaska,” said Helene Harding, who was vice president of North Slope Operations from January 2008 through June 2011.

At CD5, Nuiqsut isn’t only a neighbor; it’s also a business partner. Kuukpik Corporation, the Native village corporation for Nuiqsut, owns the land on which CD5 sits. “So our activities can impact each other,” Harding added.

Harding, DeGeorge and other members of ConocoPhillips permitting and village outreach departments were committed to finding a path forward that would be beneficial for all involved. The bridge location needed to work from an engineering, access and cost perspective while minimizing the project’s effects on key subsistence hunting and fishing areas.

“The folks who have lived in the community for many years know the land better than we ever will,” said DeGeorge, “so we sought their advice.”

“One of my most memorable times throughout this project was when we went out to the bridge site with some of the key elders from the village,” Harding said. “The elders laid right down on the tundra. I got down with them with



the maps, and that is when we picked the final location for the bridge.”

Permit applications reflecting the updated project design were resubmitted in 2009. The Kuukpik Corporation was on board. In fact, the project had broad support, including the state of Alaska, the Alaska congressional delegation, the North Slope Borough and CD5 subsurface owner Arctic Slope

RIGHT: Helene Harding with a group of village leaders and elders

ABOVE RIGHT: The launch front or “nose” of the Nigliq Channel Bridge





Regional Corporation, representing the business interests of approximately 11,000 Inupiaq shareholders.

Even with these key stakeholders aligned, CD5 continued to face permitting and legal hurdles that added two more years to the timeline.

“It has definitely been a challenge,” said DeGeorge.

In December 2011, the company received permits, followed by project sanction in 2012. Through perseverance and collaboration, seven years after the first permit applications were submitted, ConocoPhillips Alaska finally had approval to proceed.



A YEAR OF PLANNING

“Once we had our permit in hand, we quickly ramped up our efforts to execute this work,” said Jim Brodie, NPR-A Capital Projects manager, who, like DeGeorge, worked on CD5 from inception through first oil. “It really is a three-year time span from end to end. A year of planning and two seasons of

construction. And then we can move into startup.”

In 2013 — the year of planning — the project focus was on final design and engineering, ordering supplies and equipment, and finalizing construction plans. Work concentrated around bridge fabrication, expansion of the Alpine camp to support additional office and bed space needs and ordering long-lead

items like vertical support members and pipeline.

While this may sound straightforward, in this remote corner of the Arctic, it’s anything but.

“Alpine is more remote than an offshore platform. Platforms can receive some pretty big transport on ships and barges,” says Steve Thatcher, manager for Western North Slope

“You have to plan ahead and be self-sufficient out here.”

— STEVE THATCHER

Operations. “For many months of the year we’re limited to what can be delivered on our runway — but there are things we can’t fly to Alpine. Those things can only be delivered via the seasonal ice road. You have to plan ahead and be self-sufficient out here.”

ABOVE: Construction continues after drilling begins in the spring.

Alpine is the first land-based North Slope oil and gas field developed without a permanent road connecting it to other North Slope infrastructure. To the challenge of operating remotely, add summer terrain defined by ecologically sensitive tundra, wetlands and abundant wildlife, and harsh winters when temperatures commonly dip to minus 30 degrees Fahrenheit and wind gusts can reach near hurricane force.

The lack of a permanent road means a smaller surface footprint. It also means that Alpine isn't connected to the 400-mile-long Dalton Highway — known as the haul road — which allows delivery of equipment and supplies year-round to

ABOVE RIGHT: Drilling rig at CD5

BELOW: CD5 facility nearing completion

BELOW RIGHT: B70 truck hauls gravel from the ASRC mine site.



following winter. Fortunately, plans were not just well laid, they were well executed.

CONSTRUCTION

North Slope construction is bound by the short 90- to 110-day window of time — commonly called ice-road season — during the depths of winter when ice roads offer access to remote locations across the frozen tundra.

“We’re trying to do a lot of work in a very short period of time. We’re working 24 hours a day. It’s the darkest, windiest, snowiest time of the year,” said Brodie.

While schedule and budget were key project drivers, safety is the primary core value by which ConocoPhillips measures project success.

With a construction project the scale of CD5 came hundreds of skilled construction workers, many of whom had never worked in the



most of the North Slope.

With miles of tundra separating Alpine from the permanent road system (which ends at Kuparuk), more than 30 miles of ice roads must be built each winter to allow delivery of heavy equipment and supplies. The company typically begins building ice roads in December. The roads open to traffic by mid-January and close due to melting as early as mid-April.

In the middle of a frigid Alaskan winter, large-scale equipment and supplies for CD5, like the bridge infrastructure and the modular office and bed space, were trucked more than 800 miles from Anchorage. The timing was critical to ensure delivery while ice roads offered access to Alpine. Anything that wasn't delivered before the ice roads melted wouldn't reach CD5 until the



oil industry. New to the environment and with no previous exposure to the company's safety culture, these workers were at increased risk of being injured or injuring someone else. Every worker for the CD5 project was sent through the



ALPINE

ConocoPhillips Alaska four-hour Incident-Free Culture safety leadership training before they even set foot on the job site, effectively introducing workers to our safety culture while establishing the critical role of safety in our operations.

“We’re focused on the safety and well-being of our workers,” said Brodie, “which is especially critical in our high risk environment.”

“I really believe — and it’s more than a priority, it’s a core value — that safety is our number one concern,” added Joe Marushack, president, ConocoPhillips Alaska. “The most important thing I can do is set the right safety tone.”

With a focus on safety, the two-year construction phase of this long-anticipated project began in earnest during the short but very busy ice road season of 2014. The first year of construction focused on gravel placement and bridge construction.

GRAVEL

“As part of this project, we moved over one and a half million cubic yards of material,” said Jeff Osborne, CD5 project lead for roads and pads. “We needed about 600,000 cubic yards of gravel for CD5. We provided about 250,000 cubic yards for Nuiqsut and North Slope Borough projects, and the final 700,000 was over-burden, the extra top layer of material displaced to access the gravel.”

According to Osborne, trucks hauled gravel 24 hours a day, seven days a week for the duration of this phase of the project.

The team completed construction of the gravel drill site and 6-mile gravel road on schedule — achieving a key milestone toward providing year-round access to CD5, a critical safety and environmental feature of the development.

Chemical storage tanks

ABOVE: ConocoPhillips Alaska leadership, along with employees who played key roles in the project, visit the site to celebrate first oil.



Village outreach demonstrates community investment

BY MEREDITH KENNY

ConocoPhillips believes that effective two-way communication and relationship building with community stakeholders are important components of a successful project. From the planning phase through construction, beginning to end, these elements of engagement have been critical to ensuring success at CD5.

Far from the conveniences of any city and well off the road system, the [Inupiat village of Nuiqsut](#), home to approximately 425 residents, is situated in the vast tundra of Alaska's North Slope. The village sits only eight miles south of the Colville River Unit, commonly referred to as Alpine, making the relationship between the company and the community especially important.

ConocoPhillips' Village Outreach team serves as the face of the company within the community. During the CD5 construction season in 2014, Village Outreach staff maintained a full-time presence in Nuiqsut, keeping village residents up-to-date on the work being done at CD5.

"Construction season during the arctic winter is short, and we only had two ice road seasons to build the

infrastructure for CD5," said Village Outreach Liaison Rusty Creed Brown. "Between all of the construction, the additional workers at Alpine, and the temporary camps in Nuiqsut, communication was vital. We used email lists, radio (VHF) communications, online posts, flyers and newsletters in addition to in-person communication. Being accessible to the community to answer questions and provide timely information is important to ConocoPhillips and an important part of project success."

Workers at Alpine and the CD5 team maintain close relationships with Nuiqsut. "We've been working with this community since the project began in 2004," said Jim Brodie, the Capital Projects

manager for NPR-A. "We have a partnership with the village of Nuiqsut, and the relationship we've built with them over the years has directly contributed to the success of this project."

Community and project go together, and ConocoPhillips cares about the success of Nuiqsut and its residents. During CD5 construction, there were (on average) 30 jobs created each season that were filled by Nuiqsut residents. Job fairs that brought in not only CD5 contractors, but also other Alaskan companies, were held each season to give residents direct access to open positions. Job listings for CD5 positions were also sent out weekly by the Village Outreach liaisons to the community.

"Of course we care about the success of CD5 and our North Slope projects, but we also care about the success of our community partners," said Lisa Pekich,



ABOVE: NPR-A Capital Projects Manager Jim Brodie; **ABOVE LEFT:** Rusty Creed Brown and Lisa Pekich at work on the North Slope; **LEFT:** Joe Marushack with representatives from the CD5 site subsurface and surface owner corporations, ASRC and Kuukpik Corporation



director of Village Outreach. "By developing good relationships with the residents, maintaining an open dialogue and having a consistent presence in the village, we demonstrate our investment in them, in our North Slope work and in Alaska."

BRIDGES

With decades of experience on Alaska’s North Slope, the Alpine team understands road-building on tundra. But crossing the 1,400-foot-wide Nigliq Channel of the Colville River at the NPR-A’s boundary presented a unique challenge.

“The Nigliq bridge planning was critical to the success of the entire CD5 project.”

— NICK OLDS

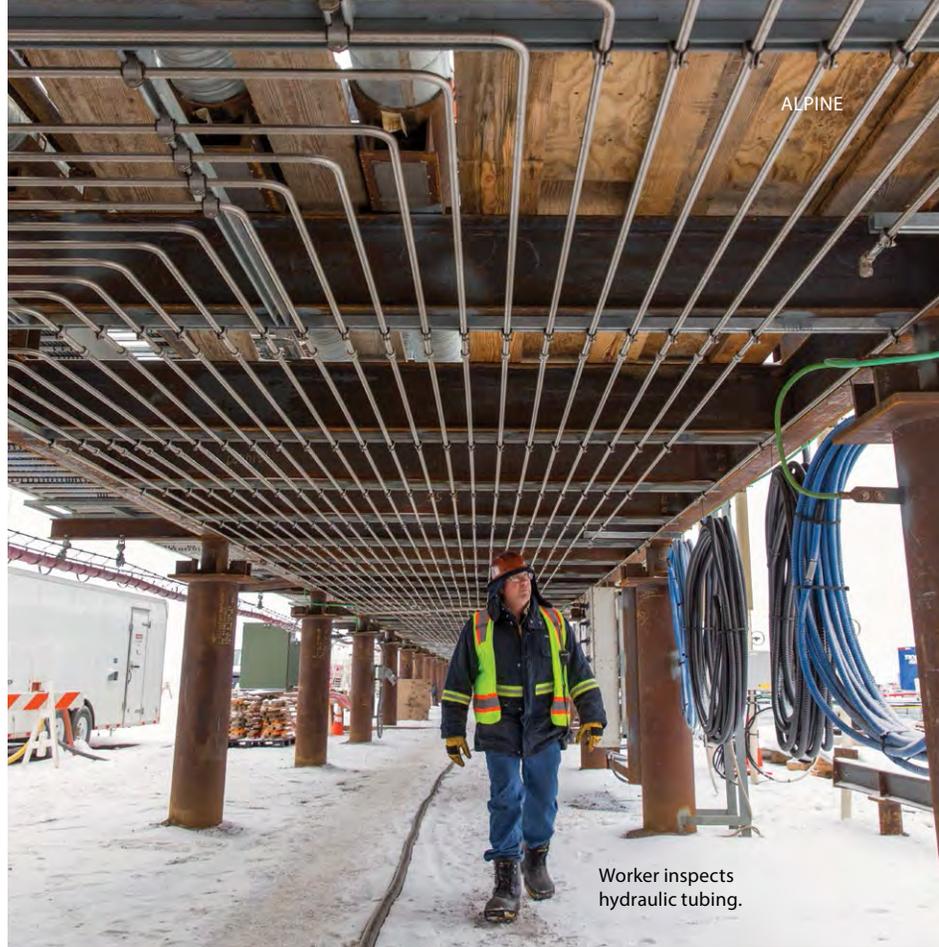
A custom hydraulic package was designed to launch the bridge, five feet at a time, over a two-month period. This technique was new to ConocoPhillips and the North Slope, and it required an added level of assurance.

A thorough mock testing of the hydraulic package and other bridge components prior to

beginning construction resulted in about 75 lessons learned that were incorporated into the final execution plan. Additionally, a project steering team of top leaders representing the various bridge construction contractors helped drive collaboration and alignment throughout the construction process.

“We planned very intensively and I think very effectively,” noted Mike Fitzpatrick, CD5 project lead for bridges, pipelines and power.

Considering the seasonal time constraints and due to its size and complexity, construction of the Nigliq Channel Bridge had to be divided into



Worker inspects hydraulic tubing.



ABOVE: Nick Olds, vice president, North Slope Operations & Development (left) and Joe Marushack, president, ConocoPhillips Alaska

LEFT: Mike Fitzpatrick, NPR-A project lead

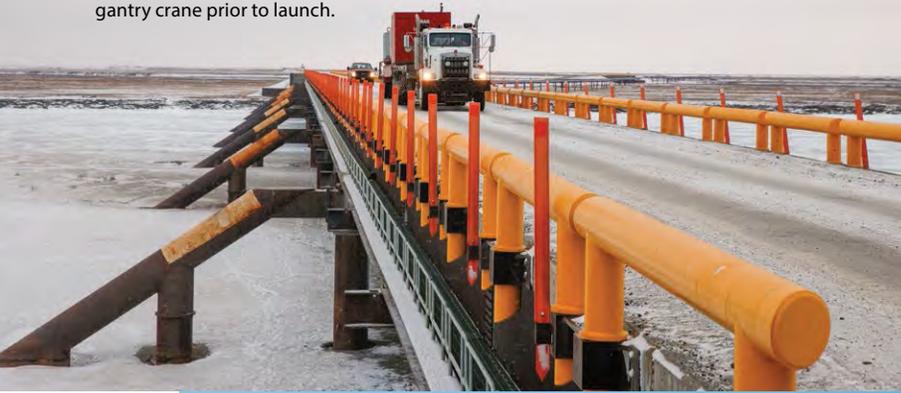
two phases. The foundation pilings and abutments were installed during the initial construction season.

Additionally, crews completed three substantial but smaller bridges and a low-impact, multi-season storage-pad built with ice and insulated to survive 15 months, through Arctic summer temperatures. The ice-pad was part of an innovative plan to deliver and stage equipment and material during the 2014 ice-road season, allowing the final construction phase of the Nigliq Channel Bridge to begin in October 2014, well in advance



Nigliq Channel Bridge
open for traffic

BELOW AND RIGHT: Nigliq Channel Bridge workers set concrete deck panels with gantry crane prior to launch.



of the 2015 ice-road season.

“The Nigliq bridge planning was critical to the success of the entire CD5 project,” said North Slope Operations & Development Vice President Nick Olds. “The extensive planning paid great dividends in the end.”

With the necessary equipment and materials in place, the team was able to begin launching the eight sections of the bridge superstructure, as planned, in October 2014, well in advance of ice-road access — nearly doubling the length of the second project construction season.

The bridge launch, as an alternative to standard bridge construction, was a big achievement for the environment and personal safety.

“The innovative launch concept reduced our environmental footprint in terms of eliminating refueling operations on the Nigliq Channel ice,” said Brodie. “It also reduced our exposure hours of working at heights by at least 50,000 hours.”

The time savings it offered was a success as well.

MODULES

With gravel laid and bridges complete, foundational year-round access to CD5 from Alpine was established. Delivery of other key infrastructure ramped up.

The modular buildings to support oil and gas operations at CD5 were fabricated in Alaska

and trucked the 800 miles from Anchorage to Alaska's North Slope, with final delivery across the ice roads.

"The decision to have the modules fabricated in Alaska was a pretty easy one. It made sense to use contractors and resources here locally," said Derrick Yi, CD5 project lead for facilities. "Beyond that, it made it logistically easier and more cost effective to manage the project."

The team took an innovative approach to the module fabrication.

"We had nine truckable modules. The majority were 90 percent complete before the ice road construction had even started. We were able to ship them north, then across the ice road without a hitch," Yi added. "When you look inside the modules, they almost look like a work of art — how well they've routed all the cable. They're perfectly straight; they're all aligned. The craftsmanship this Alaska crew brought to the project was immense."

PIPELINES, POWER AND COMMUNICATION

Like the modules, the drilling rig also arrived at CD5 in early spring, but even with drilling under-

32 miles of pipeline were installed as well.

"Getting things tied in — getting the vertical support members and laying the pipeline all in one year — that was a huge challenge for those guys," Lyden said.

"The craftsmanship this Alaska crew brought to the project was immense." — DERRICK YI

Project challenges continued during the final sprint to first oil at CD5. The weather didn't cooperate, resulting in 34 separate days in an approximately

100-day schedule that work was interrupted due to excessive wind or cold.

As was the case through all of the challenging years leading to this point, the people charged with delivering the project worked together and persevered.

"Until two years ago, there was nothing there. Now there's a gravel pad, there's a road, there are facilities, bridges, pipe racks," Yi reflected.



The Alpine CD5 team delivered first oil in October 2015, two months early and under budget, overcoming significant challenges through innovation, detailed planning and teamwork.

BELOW: CD5 roads and pads Project Lead Jeff Osborne (left) and CD5 Facilities Project Lead Derrick Yi

BELOW LEFT: A worker inspects the hydraulic panel in the CD5 chemical injection module.



way, construction continued well into 2015.

Miles of electrical lines were installed to allow CD5 to draw power from Alpine's main power generation facility. And, before oil could flow, hundreds of vertical support members and

"It took a tremendous amount of effort from a lot of local resources, the project team and so many other folks to help make that happen."

It was a long time coming, and a success well earned.

An interview with CD5 Construction Superintendent Steve Roberts



What key factors led to the CD5 team's success?

Early on, we had the opportunity to carefully select members of the project management team (PMT), so we chose individuals known for their HSE leadership and Arctic construction experience. The staff was committed from the beginning to safely constructing a drill site of the highest quality.

We also had time to plan and refine our construction activities, including a thorough review of lessons learned from previous Alpine projects and thoughtful selection of our contractors. We worked through ConocoPhillips' "readiness" process to confirm contractors were ready to mobilize and ensured that all aspects of the work scope had been reviewed, planned and coordinated for execution. And we hosted hundreds of meetings to review drawings, work plans and job hazard analyses. We repeatedly asked ourselves if we were using the safest method to complete the task.

Another key component of our success were our operational agreements with Alpine Operations. Everything from bed space and meal hours to diesel supply had to be agreed upon prior to mobilization. Throughout the project we had

unwavering support from Alpine Operations and Alpine's Drilling & Wells group.

Our construction contractors were held to a high training standard, adding Incident-Free Culture training to companies' own requirements.

Special software helped us manage the movement of materials and provided daily real-time disposition reports. We transported 2,157 tractor truckloads of goods to Alpine, shipped and barged bridge steel and pipe from the Lower 48 to Valdez



Dalton Highway Flood Response

and Anchorage, used the railroad system to move pipe from Anchorage to Fairbanks and even flew diesel and propane to Alpine when the Dalton Highway

was closed due to flooding.

To help us attract a skilled, safety-focused workforce, we provided a new, high-quality camp life experience for our construction workers.

What sets CD5 apart from other wellsite developments?

CD5 is ConocoPhillips' first drill site within the boundaries of the NPR-A. We safely accomplished in two years what had traditionally taken three. And we were able to bring in first oil two months earlier than originally scheduled. In addition, we built an entire 6-mile road system

and 11.7-acre gravel pad in a single winter.

Another groundbreaking achievement was completion of the first hydraulic bridge launch on the North Slope. Given the location, we prepared for unknown conditions. The bridge piles installed in the Nigliq Channel proved challenging, and design required multiple scenarios to address unknown subsurface and geotechnical conditions unique to each pile location.

We used a multi-season ice pad to stage bridge girders, beams and support equipment. This storage enabled the contractor to start the launch four months sooner than normal winter conditions would have allowed.

We completed all four CD5 pipelines in one winter, using thickened ice roads and ice pads to extend the construction season.

To streamline the installment process, we only shipped completed fabricated modules.

What will you remember most about CD5?

Many individuals pulled together to achieve a common goal. The project was successfully completed by a team, and each and every member of the team contributed to the success.

We set ourselves up for success by focusing on the safety and welfare of each team member and also embracing our quality standards. By successfully completing CD5, we have set the standard for safe and responsible development in the NPR-A.

FIRST OIL

With the final installation and testing of infrastructure successfully complete, on Oct. 27, 2015, first oil flowed from CD5 to the central Alpine facility, where it was processed for sale and sent

into the Trans Alaska Pipeline. The project came in under budget and nearly two months ahead of schedule.

“The company and the leadership had the staying power,” Olds said. “We’re seeing the fruits of our labor with first oil. This is fantastic.”

“We’re here because of

the outstanding team we have in place,” added Brodie. “We couldn’t have done this project without good people, and we’ve been extremely fortunate to have a team that’s really dedicated.”

Alpine has been experiencing about an 8 percent production decline each year, making the addition of new sources of oil critical to keeping the facilities running and ready to support the next discovery. Based on production estimates, ConocoPhillips expects that, for the first time since 2006, when CD3 and CD4 came online, production in 2016 will surpass production from the previous year.

The results of the initial wells are promising. Less than three months after startup with a

number of wells left to drill, CD5 has already met its production target of 16,000 barrels of oil per day, gross. And a plan to increase the number of wells at CD5 is already being explored. It’s great news for the company and for Alaska.

“CD5 is hope for the future,” said Lyden. “It has reenergized our workforce and given people hope that their kids could have a job here someday.”

And CD5 is just the beginning.

The challenges faced, lessons learned and successes found in the 10-plus-year pursuit of CD5 laid a foundation of possibility. Permits have been received, funding has been approved, and planning is underway for Greater Moose’s Tooth (GMT) 1. With continued hard work, perseverance and collaboration, ConocoPhillips plans to move further west in the NPR-A. ■

“We’re here because of the outstanding team we have in place.”

— JIM BRODIE

BELOW: (Left to right) Shannon Marler, instrument tech; Mike Lyden; Susan Card, staff facility engineer; and Jesse Thomas, operator

BOTTOM RIGHT: CD5 pipelines, power line and fiber optic cable

BOTTOM LEFT: Testing oil from one of the initial CD5 wells



Living and working in London, global hub of culture and finance

CONOCOPHILLIPS HAS OFFICES IN CITIES LARGE AND SMALL AROUND THE WORLD, BUT NONE IS MORE VIBRANT, HISTORIC OR CRITICAL TO INTERNATIONAL BUSINESS AND FINANCE THAN LONDON.

DIGITAL TABLOIDS OFTEN PUBLISH PROVOCATIVE LIST HEADLINES, SO LET'S GIVE IT A TRY: "TOP CITIES TO WORK FOR CONOCOPHILLIPS: CAN YOU GUESS WHICH IS NUMBER ONE?"

BY RAY SCIPPA, PHOTOGRAPHY BY PATRICK CURREY

London's fleet of iconic double-decker buses have transported residents and visitors since the first horse-drawn omnibus was introduced in 1829. A new design was introduced in 2010, informally dubbed the Boris Bus in honor of London Mayor Boris Johnson. The new buses feature a diesel-electric hybrid motor that produces around half the amount of carbon dioxide of a conventional bus.





Kamla Rhodes near Marble Arch, a 19th century London landmark erected on the former site of Tyburn, where for 600 years prisoners were executed by hanging. Rhodes, who took a career break to raise her family and then came back, said: "I feel very privileged to be working for a forward-thinking company that has given me this opportunity, because it can be quite difficult to get back into the workplace if you do take time out."

The answer is easy according to London Commercial employees, whose Portman House office is located near Marble Arch in the Mayfair section of London's West End, within easy reach of the city's most prestigious commercial, residential and cultural areas. The office is surrounded by an abundance of amenities and attractions: Park Lane, with its world-famous hotels; the historic Hyde Park, one of the largest in London; Mayfair's high-end restaurants and offices; and some of the world's most exclusive shops along Oxford Street, Bond Street and Regent Street, which leads to Piccadilly Circus, St. James's Park and London's renowned West End theatre district.

"I love living and working in London. It's

very dynamic and diverse, and we benefit from that here in the office," said Cash Management & Banking Supervisor Kamla Rhodes, who has worked for the company in various Finance function roles since 1991.

"I love living and working in London. It's very dynamic and diverse, and we benefit from that here in the office." — KAMLA RHODES

"I've worked in London for the last 13 years or so, and it's a great place to work," said Mark Chapman, supervisor, Derivatives, Corporate Reporting & Financial Services. "It has a lot to offer on the social side as well. It's a 24-hour city with lots of things to do."

TOP RIGHT: Mark Chapman leads a team responsible for Europe commercial accounting. “We deal with all of the derivatives accounting, including products traded on exchanges such as gas or crude futures. We’re also responsible for revenue accounting, invoicing and settlements, and trade confirmations for Europe Commercial.”

RIGHT: Nigel Hudspith joined the Phillips graduate program just before the merger with Conoco in 2001. “I’m a business graduate by training. The Global LNG group is probably one of the more global commercial groups around. Our responsibility lies in looking after LNG projects from Qatar to Alaska; Darwin, Australia to Freeport, Texas. We provide support to all of those functions from London.”

“One of the first advantages of being in London is being able to cover all the world from a single time zone,” said LNG Trading & Origination Director Nigel Hudspith. “It may mean some early morning phone calls with Australia and Asia, or some late in the day calls with the U.S., but we overlap with every place we do business during the course of a day.”

“The best thing about working in London is being able to network with people from



other companies since most of the oil and gas companies are based around the city,” said EU Compliance Advisory & Support Senior Analyst Vanessa Ruan. “It’s a prime location to meet people, to discuss relevant topics and issues and form working groups to get our position across to the regulators. From a compliance perspective, being based in London is quite vital to our role. It is the place that we need to be. And, of course, it’s an interesting place with all the hustle the bustle. It’s nice to be in London.”

Senior Finance & Performance Analysis

Overlooking the historic Tower of London on the River Thames, lower right, modern commercial buildings dominate the skyline. At the far left is 20 Fenchurch Street, also known as the “walkie talkie.” Far right, 30 St Mary Axe, located in the heart of the City of London’s financial district, has been dubbed the “gherkin.”





LEFT: Vanessa Ruan stands in front of the ornate Canada Gate at the south entrance to Green Park. She joined ConocoPhillips in 2009. “I was brought on to look after U.K. regulatory requirements, compliance training and compliance operations. Since the split in 2012, my responsibilities increased to include European Union (EU) regulatory requirements, which have grown since the financial crisis. I also look after day to day compliance, making sure all of our traders comply with U.K. and EU regulations.”

Analyst Thomas Casey summed it up: “There are a lot of benefits to the London lifestyle.”

RECENT CHANGES BRING CHALLENGES AND OPPORTUNITY

London Commercial employees also agree that, while challenging, the current commodity market is providing new opportunities. After two rounds of headcount reductions in 2015, the team, like many others around the world, is doing the same amount of work with less people.

“It’s been a bit of an adjustment for everyone,” said Gas Marketing Operations Analyst Aisling Jensen-Humphreys. “But, we’re all being exposed to more aspects of the business than we might have been.”

“When you become smaller, you have to be more nimble and dynamic,” said Kamla Rhodes.

“It means that you get involved in a lot more than you would when it’s a bigger organization.”

Her Treasury group includes just four people, who are actively involved in cash management for the company. In 2015, that team handled \$88.8 billion of investments and \$12.1 billion of foreign exchange. “I’d say we’re punching well above our

“The best thing about working in London is being able to network with people from other companies since most of the oil and gas companies are based around the city.” — VANESSA RUAN

weight to provide excellent, efficient service with quite limited resources. That’s something that we’re proud of every day.”

Crude Oil & Natural Gas Liquids Marketer Gareth John said, “Of course there are challenges, but this is a time when a lot of companies



Executive Assistant Enya Elswood pauses in front of Tower Bridge. Constructed in the late 19th century, it spans the River Thames near the Tower of London.

are using their commercial expertise to drive profits forward and increase net revenues where they can.”

John pointed out another major recent change — the lifting of the U.S. crude export ban. “Since that happened, some of the condensate has been coming to Europe, where there’s been demand for that lighter-end product. With offices here, we

“With offices here, we are well-positioned to understand who we might be able to market [the condensate] to going forward.” — GARETH JOHN

are well-positioned to understand who we might be able to market it to going forward. The lifting of the ban is certainly a positive for the company. It should help us get better value for crude out of the U.S.”

A RELATIONSHIP-BASED MARKET

London Commercial is responsible for trading products from ConocoPhillips’ North Sea assets. Ekofisk is the big one. Jasmine is one of the company’s more recent fields. And there are older heritage assets in the Southern North Sea and the East Irish Sea in addition to some smaller Norwegian fields.

While the nature of gas and power lends itself to electronic trading, crude trading requires more personal interaction between buyer and seller.

“The demand for crude products has a wide array of disposition,” said John. “Refineries in Europe, Africa and the U.S. have different

requirements for different crude. There isn’t any way to standardize as there is with power and gas. Any barrels traded out of northwest Europe have as many as 10 to 20 variables that must be agreed upon with a customer on the phone. You can’t

What are the top cities to work for ConocoPhillips?

With operations and activities in 21 countries, company employees live and work in some of the world's greatest cities, including (in no particular order) Singapore, Perth, Anchorage, Aberdeen, Houston, Calgary, Brisbane, Stavanger, Darwin, Doha, Jakarta, Kuala Lumpur and Beijing. Send us reasons why your city or town deserves to be profiled in *spirit Magazine*.

really trade that electronically.”

In short, a large part of the business is understanding and knowing the customer. “It’s a relationship-based market,” said John. “You need to know the person at the other end of the line to understand their business and their requirements for different types of barrels, timing and pricing, which basically gives you an understanding of who’s likely to want to take the barrels that we produce.”

According to Nigel Hudspeth, relationship building is key to the company’s global liquefied natural gas (LNG) business as well. “My job is primarily to go out there and sell the energy, so I will quite often find myself in Japan, Taiwan or South Korea, meeting with our customers. In LNG, relationships are everything, particularly with Japanese customers. You have to have those connections.”

Personal associations are also important to London Treasury, for Finance and Cash Management & Banking. Both rely on bonds and interaction with key people in “relationship banks” to find the best solution for the company’s needs.



ABOVE: Aisling Jensen-Humphreys strikes a pose beneath the Queen Victoria Memorial located at the end of The Mall in front of Buckingham Palace. At 25, she has been working for ConocoPhillips since shortly after graduating from university with an economics degree.



BELOW: Gareth John moved to London in 2001. “A friend who worked for a recruiting company told me about a temporary role with Conoco just before the merger with Phillips. I joined to help set up a power trading desk for the Immingham power station. About six weeks in, they decided to employ me full time and I’ve been here ever since.”



Old meets new. Left, the Shard's 95 stories loom over the Tower of London. Construction of the Tower began in the 11th century under William the Conqueror.

A unique feature of London Treasury operations is the SPOC, or single point of contact, concept introduced by current Human Resources Senior Vice President James McMorran when he was treasurer of the company's European operations. Again, it's about strong relationships, in this case with business units around the world, ensuring that they all have a dedicated contact within Treasury.

ACCOMPLISHMENTS AROUND

Pride in the London team's efforts and accomplishments runs strong through the Portman House staff, and a staunch commitment to professionalism pervades the hallways.

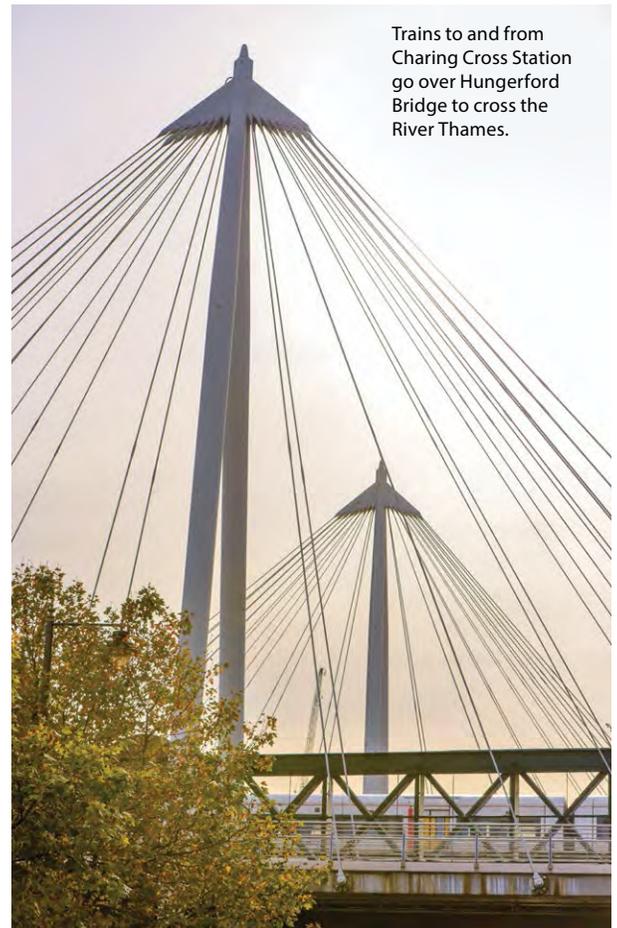
As part of her compliance role, Vanessa Ruan maintains key contacts with industry regulators. "We meet with agencies like the FCA (Financial Conduct Authority) and Ofgem (U.K. Office of Gas and Electricity Markets) to maintain an open dialog regarding how regulations will impact the oil and gas market. Sometimes the regulators may have overlooked or may not have fully understood



ABOVE: Treasury Analyst Kim Nguyen poses in front of the Union Jack. The British flag combines the red cross of St George of the Kingdom of England, the white x-shaped cross of St Andrew for Scotland and the red cross of St Patrick to represent Ireland. When the first flag of Great Britain was developed, Wales was already a part of England.

FAR LEFT: Still Water, a 35-foot bronze created by British sculptor Nic Fiddian-Green, was installed at Marble Arch in 2011.

Gas Marketer Ben Thompson



Trains to and from Charing Cross Station go over Hungerford Bridge to cross the River Thames.

What is BFOE?

As the Brent field's production has decreased, the new benchmark pricing index in Europe has been expanded to BFOE (from the North Sea fields Brent, Forties, Oseberg and Ekofisk), incorporating four different blends of barrels that go into the Brent pricing mechanism. Sales of Brent, Forties, Oseberg and Ekofisk crude are normalized with a differential for each grade to set Brent pricing. ConocoPhillips has production in Forties, Oseberg and Ekofisk (where it is one of the biggest players).

the impact regulations could have. By lobbying through industry groups and contributing to papers, we have directly influenced changes to regulations that would have adversely affected our company and industry.”

Nigel Hudspith proudly points to a 2015 SPIRIT Award for the Kenai LNG program. “It was very complicated and very successful, requiring a lot of collaboration between us and the Alaska Commercial team as well as our customers in Japan.”

Mark Chapman emphasizes how effectively the smaller London Finance team has focused on controls. “We can’t have any errors going into our accounts, so we’ve been looking at process efficiencies, automating some of them so we can do

the same amount of work with fewer people.”

Thomas Casey concurs. “It’s about increasing efficiencies and making sure we have the same levels in place. Everyone here gets that, and everyone is committed to making it happen.”

“It’s about increasing efficiencies and making sure we have the same levels in place. Everyone here gets that, and everyone is committed to making it happen.” — THOMAS CASEY

“I really like the team that I work with,” said Aisling Jensen-Humphreys. “Everyone is willing to help each other. There are lots of opportunities for trying something new, and knowledge sharing is encouraged. If you want to try something and you ask, they’ll let you.” ■

The Palace of Westminster and Big Ben loom over Thomas Casey, who reports London office financial results on a monthly basis. “I also manage the controllable cost long range plan, working with our senior management on the cost budget and continuous reforecasting. You get to see a wide array of what is going on in the office here. It’s interesting work.”





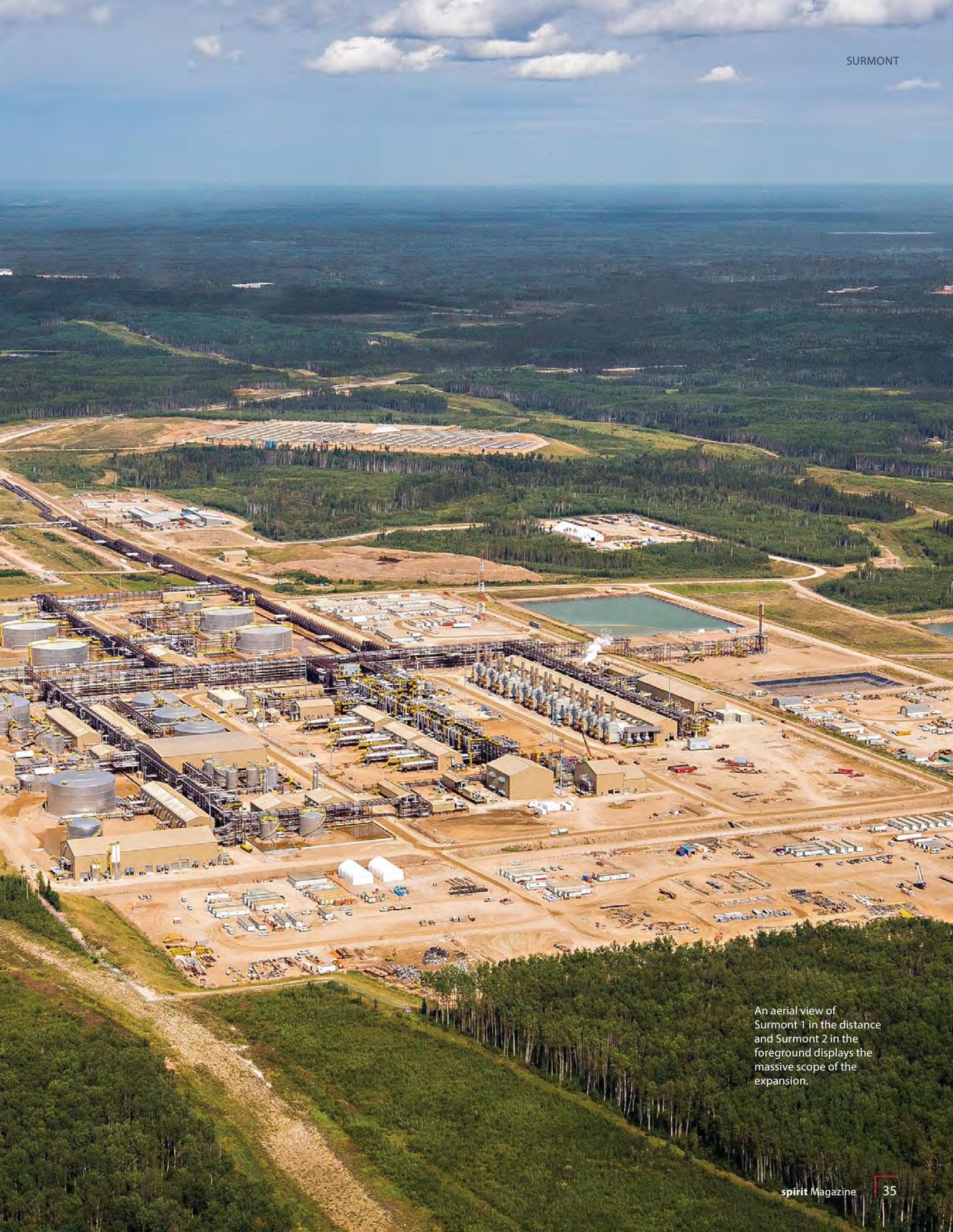
Surmont 2: Launching a 50-year legacy

BY MICHELLE MCCULLAGH

IN SEPTEMBER 2015, CONOCOPHILLIPS CANADA DELIVERED THE FIRST OIL TO MARKET FROM ITS SURMONT 2 EXPANSION, THE LARGEST SINGLE-PHASE STEAM-ASSISTED GRAVITY DRAINAGE (SAGD) FACILITY EVER BUILT. BY 2017, THE ASSET IS EXPECTED TO DELIVER MORE THAN 150,000 BARRELS OF OIL PER DAY.

Given the field's vast resources, ConocoPhillips could still be producing from Surmont as late as 2065, but a lot can happen in 50 years. It can be challenging to plan so far into the future when the industry constantly evolves and sometimes completely transforms in a short period of time. The immediate

challenge for Surmont personnel is starting up the remaining plant systems, supporting ramp-up of the remaining well pads and setting the stage for future debottlenecking projects. And today, ConocoPhillips Canada employees are taking action to shape the project's future success.



An aerial view of Surmont 1 in the distance and Surmont 2 in the foreground displays the massive scope of the expansion.



Maintenance Superintendent Greg Hull

EVERYTHING STARTS WITH SAFETY

Shaun McLellan was lured from his home province of Nova Scotia on Canada’s east coast to northern Alberta to work at a gas plant. Over the years, he added to his skills, gaining experience as a foreman, pipefitter and maintenance foreman before becoming a gas plant operator. During his past four years with ConocoPhillips, he has led a successful team.

“As Surmont grows into a 50-year legacy, it will be because of our SPIRIT Values,” McLellan said. “They keep safety front and center, and have led us to industry-leading results in Canada and around the world. Because of this, we’ve been able to develop important new initiatives like our 8 Life Saving Rules, which are a big part of how we do business and will be crucial to our future success.”

BELOW: Brian White (left) and Shaun McLellan walk by the 18 *once-through steam generators* at Surmont 2.

Surmont was one of the teams that piloted the Life Saving Rules in 2013. Through September 2015, more than 2,600 rule verifications were recorded, and the Oil Sands’ total recordable rate was a company- and industry-leading 0.07.

“I look forward to continuing this record by safely delivering the next stages of Surmont that we are about to commission, developing well pads and integrating our HSE team,” McLellan said.

“I look forward to continuing this record by safely delivering the next stages of Surmont that we are about to commission, developing well pads and integrating our HSE team.” — SHAUN MCLELLAN



MAINTAINING SURMONT

Keeping a facility in operation for 50 years requires a stringent focus on maintenance and reliability. Maintenance Superintendent Greg Hull, a mechanical engineer of 25 years, leads the team that is helping bring Surmont 2 to life.

“Starting up the high pressure boiler feed water pumps was a huge milestone this past year,” said Hull. “A well-planned and executed startup of these pumps is critical to the long-term reliability of the entire facility. Watching the team of technical specialists and Maintenance and Operations personnel working together to develop the startup plan and then execute it flawlessly was very memorable.”

For Hull, completing the field operations reorganization, which is currently underway, and then beginning to fully integrate the Surmont 1 and 2 maintenance groups will be an important part of maintaining the new facility.

“We are working toward building a stronger maintenance team focused on flawless execution, as well as becoming more efficient in how we manage our work in the field,” explained Hull. “We have a significant number of preventative maintenance optimization and tool time efficiency improvements which, once complete, will make Surmont more competitive and will set us up for a great future.”

ENVIRONMENTAL SUSTAINABILITY

Thinking for the long term is a key component of Brooke Hartwick’s job.

“A mega-project grows into a 50-year legacy asset through the small decisions we make every day,” said Hartwick, a junior environmental coordinator who joined ConocoPhillips in 2015. “Our operating practices and industry-leading standards hold us accountable, so we make the decisions that are right for our business while also protecting the environment.”

For Hartwick, long-term sustainability starts with an intense focus on safety and on preventing every spill — no matter how small. She and her team are focused on identifying barriers to spill prevention, continuing to analyze spill incidents and regularly participating in regional initiatives to reduce environmental impacts.



Shaun McLellan,
HSE team lead



Junior Environmental
Coordinator Brooke Hartwick
works on a vegetation
management program to
identify an appropriate
spraying plan. Hartwick
works with a team focused
on reducing environmental
impact at Surmont.



ConocoPhillips Canada works with industry to accelerate recovery of disturbed sites toward self-sustaining boreal ecosystems.



The Surmont 2 central processing facility is almost as long as 10 Canadian football fields.

PEOPLE AND INNOVATION

One of the first people to join the Surmont 2 pre-operations team in 2012 was Operator Brian White. Since then, he has been front and center as the team celebrated first steam and then first oil.

“I went from a small Alberta power plant with 34 employees that had been in operation for 20 years, to being a part of the commissioning and startup of the largest single-phase SAGD production facility in the world,” White said. “The project has been an immense challenge so far, and I look forward to seeing its full capabilities emerge over the years to come.”

The expanded Surmont facility will be operated by more than 350 field staff running systems that support well pads, steam generation, water treatment, bitumen treating and a variety of other functions essential to the operation.

White knows there are critical factors in keeping Surmont competitive for the decades to come.

“To operate Surmont as efficiently as possible, it is crucial that we maintain our commitment to testing new technologies, automations and equipment,” White said.

Recently, the team submitted patent applications for dozens of new technologies, published groundbreaking technical papers, leveraged



Brian White

practices from other types of asset and implemented new ideas, all of which help move the company forward.

THE GLOBAL COMPETITION

Hundreds of people have been proud to play a part in operating Surmont, including Oil Sands Senior Vice President Perry Berkenpas, who worked to bring Surmont 1 online in 2007. Berkenpas recently returned to Canada to lead the development of all ConocoPhillips' oil sands assets.

"We have this enormous gift of a legacy asset that will be worked and developed by generations

of people, and they're going to achieve things that we hadn't even thought of," said Berkenpas. "It's exciting to be on the edge of a monumental shift in what we believe is possible in the oil sands."

But to be competitive over the long term, Surmont faces stiffer competition from more than just the plant down the road. "Our challenge is to drive down our cost of supply, so we can compete with assets around the world," explained Berkenpas. "We want Canada's oil sands to be a solid production platform for our company and to provide strong growth alternatives to balance our unconventional oil and gas assets. But to do that, we will need to compete on every front."

One way the company is meeting this challenge is by reducing its steam-to-oil ratio. "Anything we can do to reduce the amount of steam required for each barrel of oil produced will decrease the overall cost of supply, reduce greenhouse gas emissions and water use, and increase the amount

"To operate Surmont as efficiently as possible, it is crucial that we maintain our commitment to testing new technologies, automations and equipment." — BRIAN WHITE

of oil we can produce," said Berkenpas. "Day-to-day collaboration through our Integrated Operations Centers helps us decide where and when to inject steam to ensure the most efficient operations possible and achieve the best long-term steam-to-oil ratio possible. Managing our water usage is also important; to be a great oil company we have to be a great water company as well."

Berkenpas looks to the future of the company's oil sands operations.

"We have many more challenges to face, but our team is working together every day to take on the challenge to do our business better," said Berkenpas. "That's what makes this an exciting place to work. We are on the path to safely and successfully executing our plan, setting the stage for Oil Sands to be a leading asset in ConocoPhillips' portfolio for decades to come." ■



Perry Berkenpas, senior vice president, Oil Sands



**Surmont 2
Commissioning and
Start-up**

Better, faster, cheaper:

Compressive imaging redefines the seismic game

BY JAN HESTER



Ken Tubman, vice president, Technology & Subsurface



Richard Lunam, president, Exploration & Other International

IN 1921, CONOCO FOUNDER E. W. MARLAND ASSEMBLED THE FIRST REFRACTION SEISMOGRAPHY CREW IN THE U.S., THE FIRST TIME AN AMERICAN OIL COMPANY USED SEISMIC TECHNOLOGY AS AN EXPLORATION TOOL. SINCE THOSE EARLY DAYS, THE OIL AND GAS INDUSTRY HAS RELIED ON SEISMIC DATA TO FIND AND PRODUCE HYDROCARBONS.

The traditional approach has been successful, but the need for higher resolution images in complex regions highlights fundamental technological shortcomings.

ConocoPhillips' proprietary technology, compressive seismic imaging, or CSI, transforms the game by greatly improving image quality, reducing costs and speeding up acquisition. CSI has now been utilized in two full field trials: offshore in the North Sea's Judy field and in the Lookout development on Alaska's North Slope. The Houston-based Geophysical Services team is currently processing data from both projects, and initial results show great promise.

Another important feature of CSI is its ability to separate, or deblend, data collected simultaneously from multiple locations without loss of fidelity. The combination of CSI sampling and deblending technologies represent a step change in seismic acquisition efficiency and data quality.

"The success of compressive seismic imaging is a great example of innovation at ConocoPhillips,"



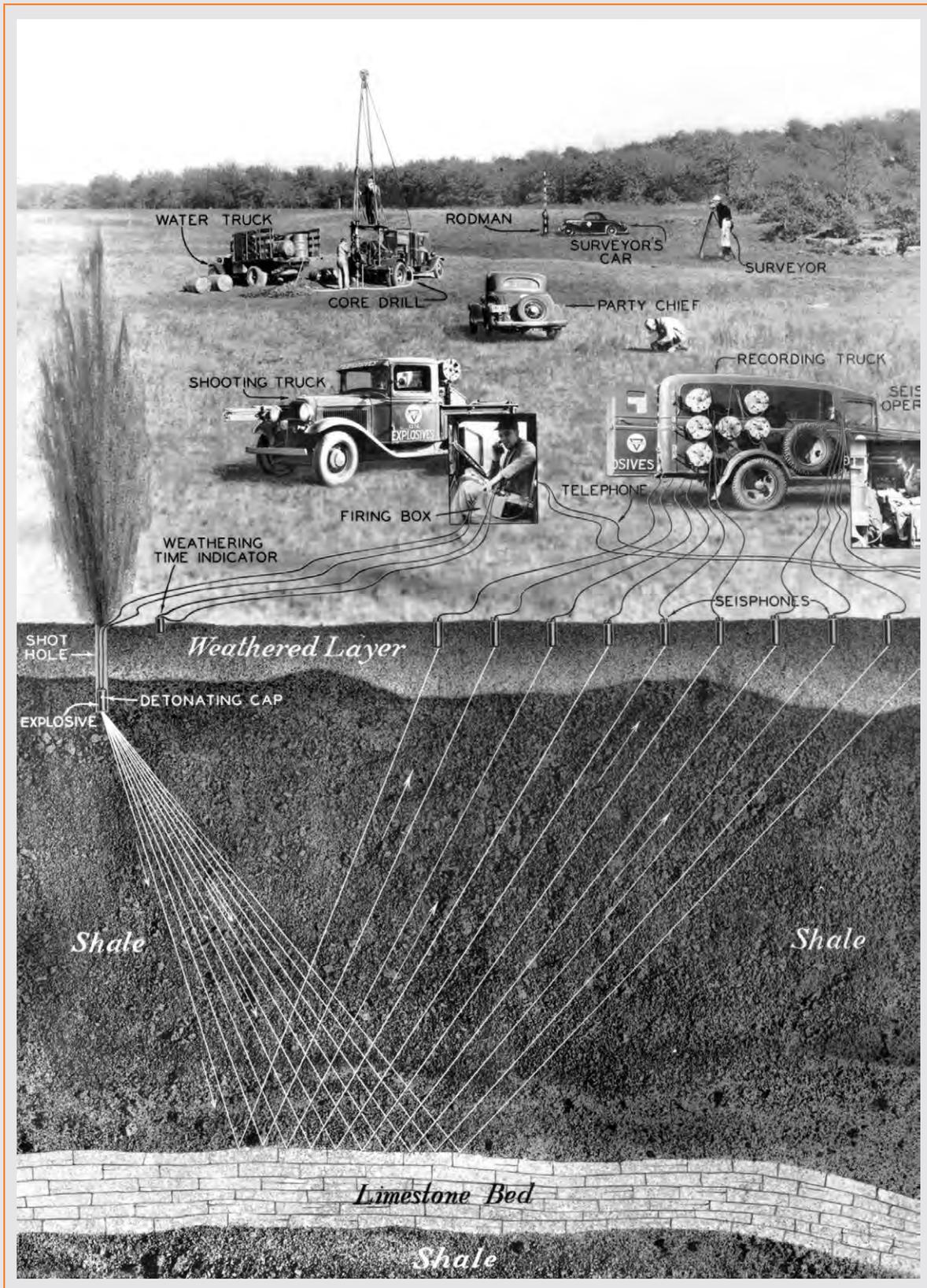
Compressive Seismic Imaging

said Ken Tubman, vice president, Technology & Subsurface. "When a core team works proactively with the business units to implement a new technology, it can make a large impact on the company's business."

IT'S NOT RANDOM, IT'S OPTIMIZED

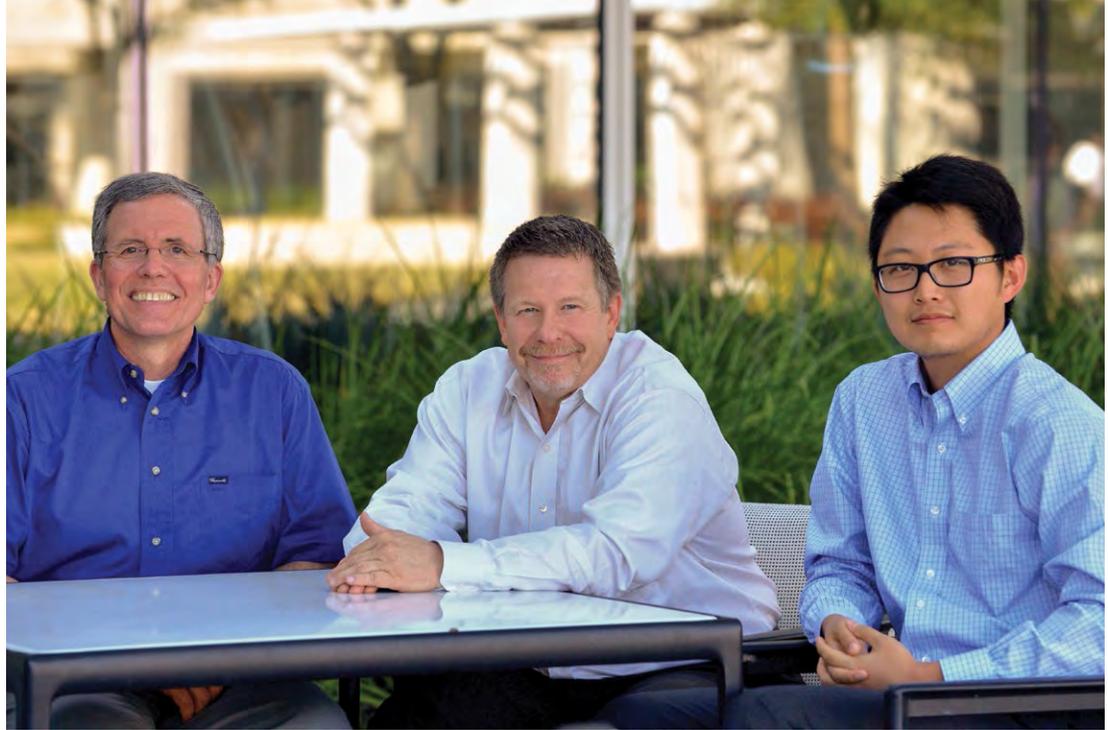
"ConocoPhillips has a long history of technology leadership in geophysics, and the implementation of CSI continues this legacy. It exemplifies two of our SPIRIT Values, Innovation and Teamwork, and is a meaningful example of how the relationship between the functions and business units can create value," said Richard Lunam, president, Exploration & Other International. "The improved image quality and cost savings that CSI is delivering in projects across the globe provides an opportunity for our company to better exploit its existing assets and position ourselves in new exploration plays in a cost effective and timely manner."

To explain how the new technology is a differentiator, Geophysical Services Manager Brad Bankhead



In the 1940s and 1950s, the company deployed seismic crews to map potential structures. Dynamite provided the source of energy directed into the earth, and the returning waves were recorded to produce the basis of geological maps.

From left: Chuck Mosher, geoscience senior fellow, Geophysical Services; Brad Bankhead, manager, Geophysical Services; and Chengbo Li, senior geophysicist, Geophysical Development



“There have always been tradeoffs with acquiring seismic data. If you wanted enhanced quality, it took longer to collect the data, and that drove up the cost. CSI gives you all three, with no tradeoffs.”

— BRAD BANKHEAD

draws a triangle on his white board and labels each of the three points: quality, cost and timing. “There have always been tradeoffs with acquiring seismic data. If you wanted enhanced quality, it took longer to collect the data, and that drove up the cost. CSI gives you all three, with no tradeoffs.”

“Instead of using uniform sampling, which involves collecting data every few feet based on a grid, we can now optimize the process of selecting data collection points by using algorithms,” said Bankhead.

The technology offers a range of options when it comes to acquiring seismic. Compared to conventional seismic, the business unit can get the same level of quality for a lower cost. Or, for the same dollar amount, it can get higher quality data or cover a larger survey area.

CSI applies compressive sensing (CS) technology, a [mathematical sampling theory first used by the medical industry](#) to speed up imaging processes such as MRIs. Compared to regular 3-D seismic, CSI enables geoscientists to reconstruct a higher quality, more accurate picture with less data.

The CS technique was first applied to an MRI in 2009, shortening the time it took to scan a young child’s failing liver from two minutes to 40 seconds — long enough to gather the much-needed data without having to further endanger the little boy’s life.

Applying CS to seismic was the brainchild of Senior Scientist Chuck Mosher, who has followed the concept since the 1980s. “It sounds too good to be true, but it’s not. CSI improves efficiency by

a factor of 10. That’s 1,000 percent.”

Mosher’s job is to identify new technologies that add value to ConocoPhillips business units. “You have to cast a wide net to find opportunities that are both applicable to our industry and economically viable. We closely follow the medical

Compressed sensing — also known as compressive sensing, compressive sampling and sparse sampling — is a signal processing technique for efficiently acquiring and reconstructing a signal. It is a mathematical tool that creates hi-res data sets from lo-res samples. It can be used to resurrect old musical recordings, find enemy radio signals and generate MRIs much more quickly.

Game changer for acquisition on the North Slope and seismic acquisition in general

Compared to legacy data:

- Orders of magnitude difference

Compared to conventional modern survey design:

- Can acquire the same survey *faster* (i.e., *cheaper*)
- Or ... can acquire *larger survey* in a given season at the *same price*
- Or ... can design *extremely high quality* survey at the *same price*

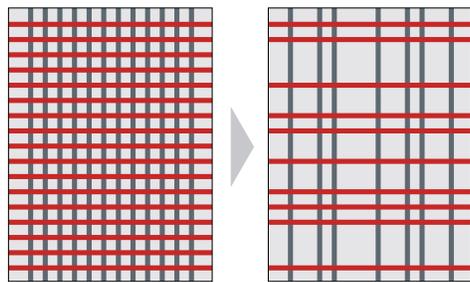
BETTER data **FASTER** acquisition
CHEAPER cost

industry, but 99 out of 100 new technologies end up being irrelevant to the oil and gas business. CS turned out to be that 1 in 100.”

Mosher hits the high points of how CSI works at ConocoPhillips. The business unit determines an

Traditional vs. CSI sampling

On the left, a traditional uniform seismic survey grid; right, a CSI design shows a non-uniform, optimized sampling.



area they want to survey, and the CSI team generates a grid. “Say we’d like to have a sensor every 10 feet but can’t afford it. The CSI optimization algorithm helps us determine when it’s ‘good enough’ and enables us to work around obstacles such as off-limit property. We end up with a pattern that looks random, but it’s not. It’s optimized.”

Mosher notes that another breakthrough that contributed to the project’s success was the company’s dramatic increase in computing power. “CSI requires processing huge volumes of data. ConocoPhillips’ high performance computing (HPC) enabled us to do that.”

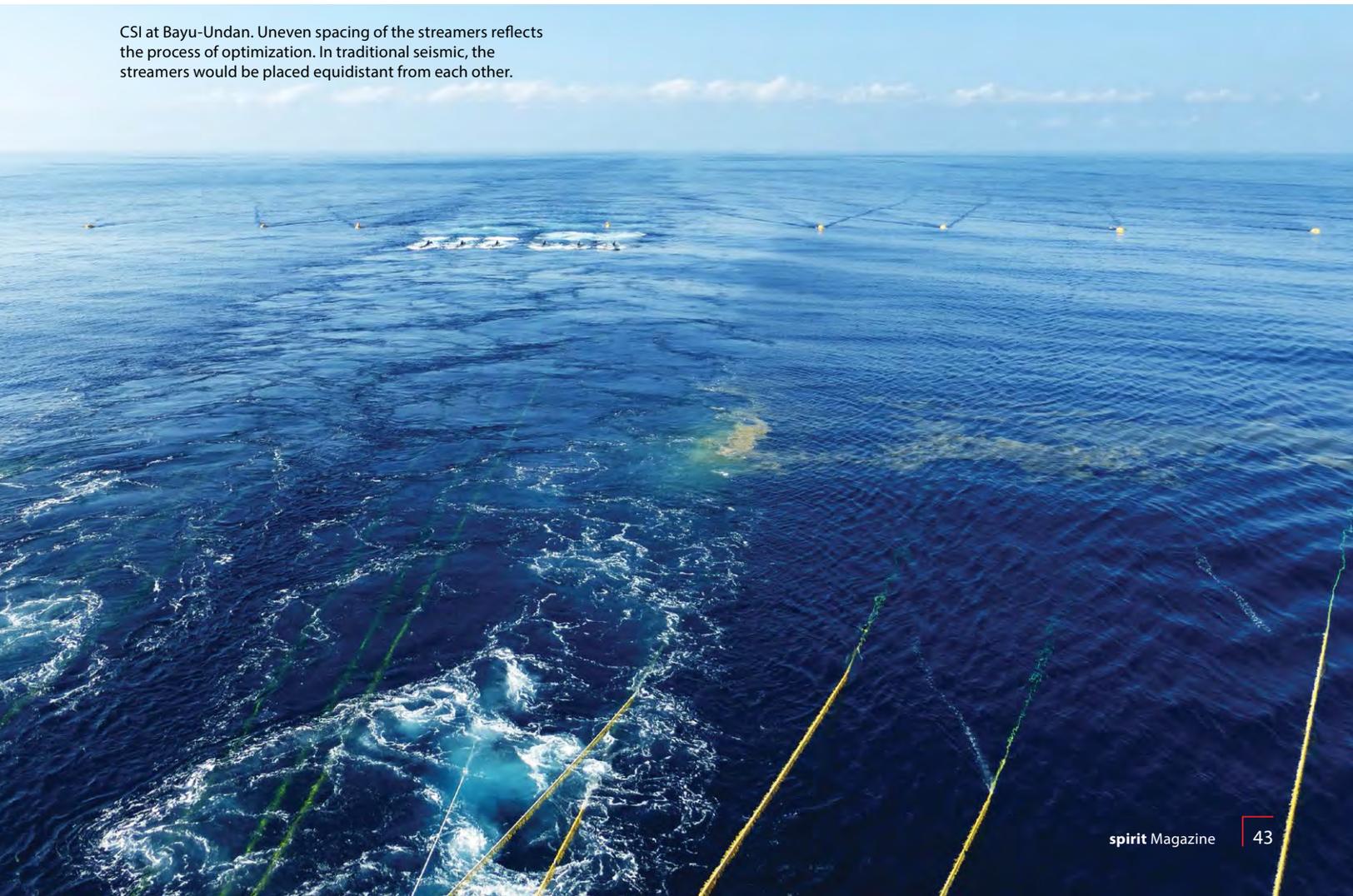


Mike Faust, manager, Exploration, ConocoPhillips Alaska

THEN AND NOW: MAKING SENSE OF ALL THAT NOISE

Senior Geophysicist Chengbo Li, one of the company’s leading CSI researchers, has played a major role in the program’s success, including developing a technique, known as deblending, that removes the interference between competing data sources.

CSI at Bayu-Undan. Uneven spacing of the streamers reflects the process of optimization. In traditional seismic, the streamers would be placed equidistant from each other.





A winter seismic vehicle on Alaska's Arctic tundra

“Imagine walking into a room with several people talking at once. With sensing devices, we can now use the CSI algorithm to essentially listen to one individual voice at a time.” — CHENGBO LI



Erik Keskula, manager, North Slope Development

“Imagine walking into a room with several people talking at once. With sensing devices, we can now use the CSI algorithm to essentially listen to one individual voice at a time,” said Li.

Alaska Exploration Manager Mike Faust explains how the technique overcomes challenges associated with acquiring seismic data. “With deblending, the volume on the surface and the noise we put into the ground don’t matter. This gives us enormous flexibility.

“For the past 50 years, shooting seismic required that people and equipment avoid making noise that could interfere with the equipment. We are listening for something subtle and difficult to hear over ambient noises like wind and wave action, so it was disruptive to have trucks and heavy equipment moving around and even people walking near the sensing devices. The process involved shooting, then gathering the equipment and moving to another location and repeating those two steps until the process was complete. It could be very time consuming.”

The first application of deblending technology

was at East Judy.

“Before CSI, we could only acquire one data point at a time, because otherwise the signals would overlap and generate interference,” said Bankhead. “Using two boats simultaneously enabled us to reduce the amount of time required to gather the data and saved us approximately \$8 million.”

On Alaska’s North Slope, shooting conventional seismic presents special challenges. Seismic data must be collected during the winter when the ground is frozen solid to minimize environmental impact to the Arctic tundra. “You need 6 to 8 inches of ice or snow on the surface. So, in a normal four-month winter season, we could only shoot 200 to 250 square miles,” said Faust. “For the Lookout trial, we had 10 vibrator trucks operating simultaneously and were able to deblend during data processing phase. Our fundamental process hasn’t changed. We still drive light vehicles and put out listening devices and vibrators on the surface. But now we’re only limited to the speed of the vehicle and our ability to move listening devices.”

PUTTING CSI TO THE TEST

The company launched its formal CSI research program in 2010. The first field trials, starting in 2011 in the North Sea, were small tests using 2-D seismic to save money. “The trial was designed to reduce an element of risk,” said Bankhead. “The approximate cost was \$5.5 million, whereas using conventional 3-D would have cost \$25 million.”

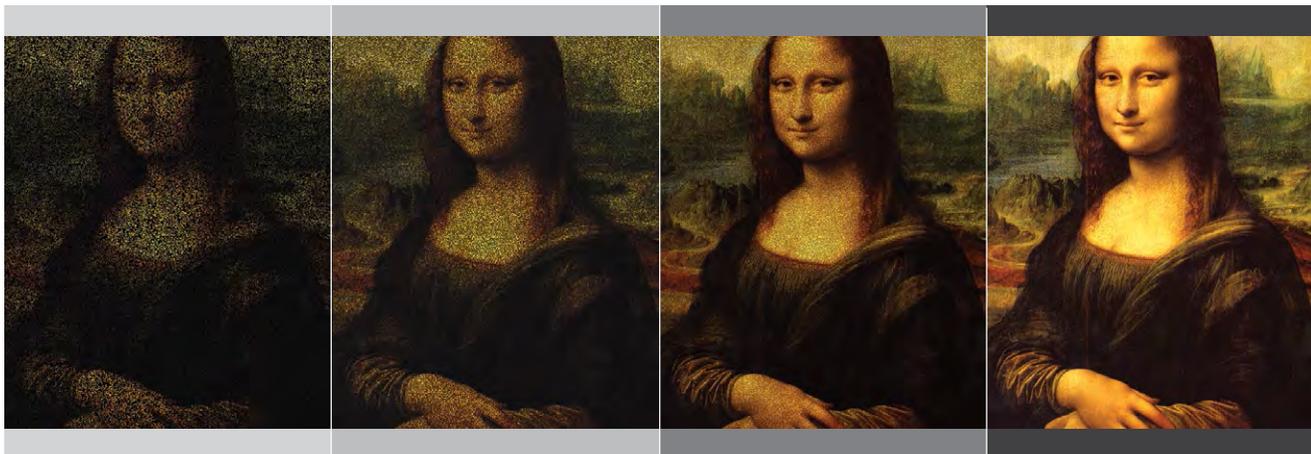
In 2013 the company launched its first full 3-D CSI field trial at Eldfisk in the Norwegian North Sea. Both of these early trials succeeded in reassuring company leadership that the technology

was solid and ready for a full-blown field trial.

Bankhead noted that another key element was convincing the business units to take the risk required to field trial the new technology. “There is always risk associated with spending millions on a new idea,” Bankhead said. “We were excited by the trial info, but at some point somebody had to commit to full-scale testing.”

The U.K. and Norway business units were willing to help move the technology forward. “Our first small trial was at Eldfisk. Norway invested time and money to help us and took risks to

How compressive sensing completes the image:



1. Undersample

Using CSI technology, the team acquires a small fraction of the data required for traditional seismic methods.

2. Initial guess

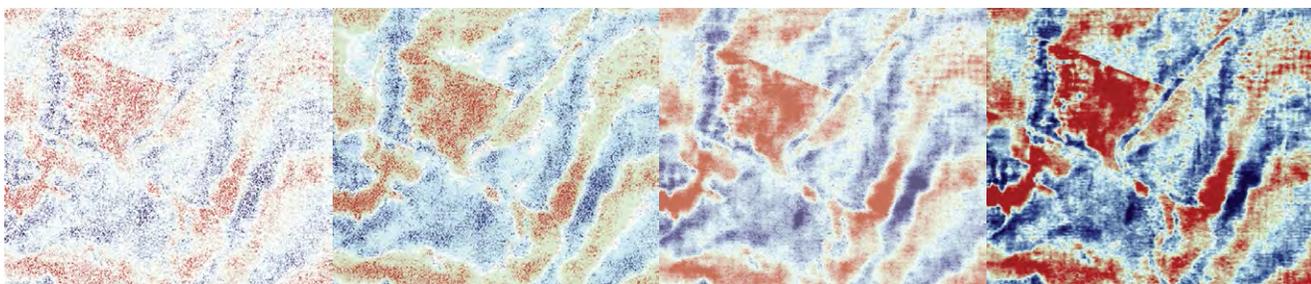
The CSI algorithm captures general information about the data and fills in gaps with initial guesses.

3. Iterate

The algorithm then begins to construct the image, improving it at each iteration by modifying the data with the simplest possible shapes and values.

4. Achieve clarity

After several iterations, the algorithm creates an image almost identical to what it would reflect had seismic data been acquired at all locations.



benefit the rest of the company. The next trial was at East Judy in the U.K. North Sea. I credit the Norway and U.K. business units for making this success possible.”

Mosher also points to Erik Keskula, now manager of North Slope Development, for his leading role in encouraging management to support field testing the technology. Keskula has the unique experience of witnessing the value of CSI from both the Technology and business unit vantage points. “Critical success elements for the project included senior management support, space and time to do the work, the right resources and business units willing to take a risk,” said Keskula. “But it never would have happened without a visionary like Chuck Mosher, who saw the opportunity, fought for it and had the technical know-how to advance the technology so that the business units could ultimately adopt it with confidence.”



BELOW: On the Alaskan Arctic tundra, from left: Chengbo Li and Laurence Williams, principal geophysicist, Seismic Acquisitions, Data & Contracts

EAST JUDY

The first full field survey was conducted in the North Sea’s east Judy field, located in the North Sea between the U.K. and Norway. All wells in the

area tie back to the Judy platform.

“We started with this location because offshore is much quieter, much cleaner and generally faster,” said Andy Leishman, subsurface manager for ConocoPhillips U.K. “When you’re shooting on the sea floor, you don’t have to be as concerned about obstructions as you would on the surface.”

The survey targeted several well locations for exploration and development potential in blocks not yet fully examined by the company. Between October 2014 and February 2015, the team shot 350 square kilometers of seismic.

“We were looking for a step change in our seismic in the eastern part of Judy field. Our previous data, captured in 2001, had been reprocessed a couple of times and was pushed to its limit in terms of what we could expect,” said Leishman. “Our fundamental intent for acquiring new data was to improve our ability to position wells. We needed to identify structures with greater clarity, especially faults, for better well performance.”

Leishman noted that the data is still being processed in Houston. “But what we’ve seen so far is a big improvement over what we had. The new imaging makes it much easier to see what’s going on underground and will help us optimize well placement. It increases our confidence in well locations and reduces risk and uncertainty. We now have a full, complete and relatively consistent data set that we can use.”





“We started with this location because offshore is much quieter, much cleaner and generally faster.” — ANDY LEISHMAN



LOOKOUT

In late 2014, the first onshore survey started at Lookout GMT1, located in the National Petroleum Reserve-Alaska. Mike Faust explains why the team decided to go with CSI for their seismic survey. “The team needed better quality data for the purposes of development well planning.”

Bankhead noted that, before the CSI field trial, the team had originally planned to shoot conventional seismic and had budgeted roughly \$15 million for a 50- to 60-square mile area. “Given the range of options available with CSI, we chose to shoot much higher quality data in the same amount of time. We ended up shooting 80 square miles and got data eight times denser for the same price.”

The Alaska business unit will soon have the deblended data it needs for determining well placement. Production at Lookout GMT1 is scheduled to begin in 2018.

Faust concedes that the team took a risk when it agreed on the field trial. “It took courage to try

this. We’re spending \$1 billion on this development, so budgeting \$15-20 million out of the blue to shoot a new kind of seismic took courage. I’m really proud of the geophysicists up here who were willing to try this. They took a personal career risk, basically saying, ‘I don’t completely understand, but I trust you.’”

MOVING FORWARD

The most recent application of CSI technology was over the Bayu-Undan Field in Timor Leste. The survey was completed in late 2015, and the processing should be completed in the third quarter of 2016.

“We acquired the new seismic data with the PGS vessel Ramform Sovereign, the first full-scale streamer survey using CSI technology,” said Frank Krieger, vice president, Exploration & Development for the Australia West business unit. Because of the success at Bayu, we made the decision to also use the technology for our Barossa survey in mid-2016.”

Bankhead notes that, in addition to two other planned development CSI surveys, the company has opportunities to leverage the technology externally.

The future looks bright for CSI. It has been proven to work well worldwide, offshore and onshore, for both exploration and development. Bankhead summed it up: “Seismic costs too much money to properly sample the earth. This gets us much closer.” ■



Andy Leishman, subsurface manager, ConocoPhillips U.K.



Frank Krieger, vice president, Exploration & Development, Australia West business unit

Collaboration in the cloud: Office 365 will reduce costs and boost productivity

BY ADRIANNA RUIZ, PHOTOGRAPHY BY GUS MORGAN

WOULDN'T IT BE GREAT TO ENHANCE THE WAY YOU WORK WITHOUT COMPROMISING SECURITY, RELIABILITY AND MOBILITY — ALL WHILE CUTTING COSTS?

Welcome to Office 365. Microsoft's next-generation solution delivers a robust, less costly platform for email, Office tools (Word, Excel, PowerPoint, etc.), SharePoint and personal work file storage (OneDrive for Business), plus new capabilities and

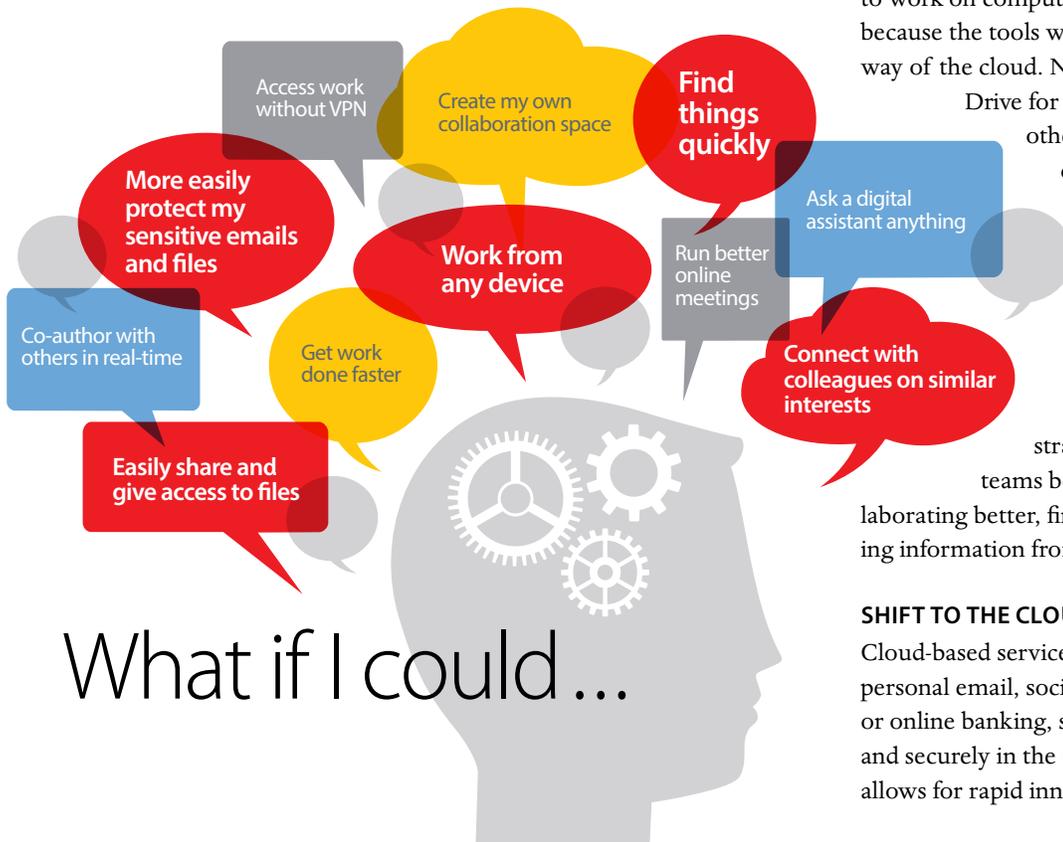
innovations — all via the cloud. With Office 365, ConocoPhillips people can fully participate in meetings without a work computer, instantly create a place to collaborate, share files in a single step, generate shared distribution lists (without calling the IT Help Desk), protect sensitive emails and files, edit files on the go from any device and use a digital assistant to stay on top of tasks.

Office 365 is both familiar and new. Familiar because Microsoft Office productivity tools like Outlook, Excel, Word and PowerPoint continue to work on computers as they always have. New because the tools will be continually updated by way of the cloud. New products like Delve, OneDrive for Business, Sway, Yammer and others will become available at no cost, boosting capabilities for search, storage and collaboration. Mobile and browser apps will improve access for people away from the office.

These innovations are part of the ConocoPhillips Information Technology (IT) strategy to help individuals and teams become more productive by collaborating better, finding things faster and accessing information from anywhere.

SHIFT TO THE CLOUD

Cloud-based services are universal. Whether it's personal email, social media, travel-booking sites or online banking, such services are hosted reliably and securely in the cloud. In addition, the cloud allows for rapid innovation — new capabilities



Access work without VPN

Create my own collaboration space

Find things quickly

More easily protect my sensitive emails and files

Ask a digital assistant anything

Work from any device

Run better online meetings

Co-author with others in real-time

Get work done faster

Connect with colleagues on similar interests

Easily share and give access to files

What if I could ...

can come quickly and seamlessly, allowing software applications to be updated without costly, time-consuming large-scale upgrades. Office 365 is part of the evolution to a service delivery model where software is hosted in the cloud and offered as a service.

“Office 365 supports our cloud strategy, and aligns with our plans to simplify software updates,” said Andy Knight, director, Infrastructure Architecture. “New software and solutions will increasingly be offered in the cloud, some exclusively. We want to be positioned to take advantage of the latest technologies, while keeping our costs down.”

SUPPORTING COST SAVINGS

Moving to the cloud will deliver cost savings related to vendor licensing fees, support staff, software updates and server refresh and storage hardware investments.

Over the years, ConocoPhillips has incurred significant expenses on email and SharePoint upgrade

Cloud opens doors to new solutions

ConocoPhillips’ cloud strategy is based on agility, pace of innovation and long-term economics.

“The Cloud Center of Excellence (COE) helps establish legal contracts and a core



Pat Beahan

Infrastructure as a Service (IaaS) environment in both Amazon AWS and Microsoft Azure,” said Pat Beahan, director, Strategy & Cloud COE. “This enables the move from existing on-premise solutions to the cloud when it makes economic sense.”

With a legal e-Discovery solution in Amazon AWS, several mobility applications in Microsoft Azure, and cloud-based Disaster Recovery safeguards, the company is already reaping benefits from the cloud.

Businesses interested in cloud-based solutions can contact the Cloud COE at CCOE@ConocoPhillips.com.



projects. Now, the company can avoid the costs and resource drain related to those projects.

The move to the cloud also is consistent with IT’s philosophy of limiting customization and driving standardization, which aligns with today’s cost-conscious environment. Standardizing on cloud platforms, and replacing obsolete tools and highly customized applications, should bring significant additional cost savings.

“Services like Office 365 allow IT to spend more time on activities that add differential value to the company such as increased focus on core business challenges, developing new differential solutions and increasing agility while reducing costs,” said Chief Information Officer Mike Pfister.



ABOVE: Chief Information Officer Mike Pfister

TOP: The Office 365 team (from left) Kendal Rogers, Andy Knight, Adrian Hyde (seated), Christy Clark, Brad Federwich and Adrianna Ruiz

JOURNEY TO OFFICE 365

In 2014, ConocoPhillips IT began evaluating Microsoft’s cloud-delivered functionality through a pilot program involving the IT function and early adopters across the organization.

“The pilot let us validate our intention to move to Office 365,” said Adrian Hyde, infrastructure architect and lead Office 365 expert. “It challenged some of our theories and confirmed others. With lessons learned from the pilot, we were ultimately able to establish a safe, secure and reliable platform suitable for enterprise use.”

Your familiar Office, only better!

Phased migration

Wave 1: Migrate email and upgrade to Office ProPlus (the latest version of the Office suite)

Wave 2: Migrate personal work content from P: Drives to OneDrive for Business

Wave 3: Migrate SharePoint to SharePoint Online

Wave 4: Other content migrations



Canada goes first

ConocoPhillips Canada has been the frontrunner in the company's journey to Office 365.

"This enables us to lay down our local email infrastructure," said Doug Anderson, IT manager. "Email is a commodity and therefore an ideal candidate for a shift to a cloud-based provider, so we were excited to be on that first flight."

"In addition to saving us money on costly server refreshes, we're excited about the productivity enhancements that Office 365 brings to our customers. Some are already taking advantage of better access from any device, sharing and co-authoring of documents."



Doug Anderson

Contract negotiations were complex for this cloud-based arrangement, but the terms and conditions were eventually finalized through strong partnership with Legal and Supply Chain.

In July 2015, IT decided to accelerate the Office 365 transition to more immediately capture cost savings. A more aggressive, coordinated effort began. Engaging closely with the business during the planning process, IT launched a phased, global rollout taking local constraints into consideration. The rollout is segmented into waves, starting with the most proven and least disruptive processes — email migrations and Office upgrades.

By January 2016, more than half of the company email had been moved to Office 365, and a majority of computers had been upgraded to Office ProPlus. Wave 1 is expected to complete in 2016, and planning is underway for subsequent waves to occur in parallel throughout 2016 and 2017.

The next step is helping the company adopt the

Leadership Forum benefits from real-time collaboration

One of the Office 365 suite of tools, OneNote is a digital notebook used for note-taking and collaboration.

In November 2015, the Leadership Forum, ConocoPhillips' top executives and managers, used OneNote to facilitate strategy sessions.

"We were able to view ideas from the different sessions as they were being entered into OneNote, without interrupting the sessions," said Christine Lloyd, manager, Talent Management. "By the time we concluded, we had already chosen ideas to discuss with the entire forum. This allowed us to use our time more efficiently."



Christine Lloyd

Strategy. "Helping individuals understand how Office 365 can improve their productivity is the transformational challenge that lies ahead."

The journey to Office 365 will result in a robust, sustainable productivity platform for the enterprise; one that is scalable, cost-effective, enables innovations and aligns with technology delivery models of the future. Having improved access to familiar tools, plus new tools and functionality to come, will give individuals new ways to collaborate and get work done.

With Office 365, ConocoPhillips is doing business better. ■

new tools and begin taking advantage of them.

"The cost efficiencies of leveraging cloud solutions are proven, but that's the IT part," said Christy Clark, director, Digital Workplace



Success starts here

There's a lot to learn about Office 365. The ConocoPhillips Office 365 Success Center is a great place to start. Search "Office 365" on *The Mark* for FAQs, videos and tips on getting the most out of it.

So, what's in it for everyone?



Work on the go means greater access for email, calendars or documents from any device, anytime, anywhere. Install Office tools on home computers, phones or tablets. Or, access online versions at portal.office.com.



Share and collaborate means there's a new way to share and grant permissions to files from OneDrive for Business, SharePoint or an Outlook Group instead of sending attachments. This allows for co-authoring in real-time, or shared editing, on any of the Office apps.



Protect your information means sensitive content can be better secured using encryption and other tools. Prevent email recipients from forwarding confidential emails, and protect sensitive content in a presentation from being printed or projected.



Find files faster means a new way to discover and recover content. With enhanced search options like Delve's ability to surface content based on activity and trends, Office 365 simplifies searching without compromising security.



Run more effective meetings means fully participating in meetings anywhere, on any device. Capture meeting attendance automatically, keep notes in one place, and co-author a document during a meeting by using Skype for Business, OneNote and other Office apps in combination.



Connect in new ways means new ways to sync up with others on common initiatives. SharePoint continues to be an effective collaboration space. New tools like Yammer and Outlook Groups let individuals create their own space — no IT request required.



Cory Minton

Coach for Life

TEXT AND PHOTOGRAPHY BY PATRICK CURREY

FOR SAN JUAN BUSINESS UNIT ROTATING EQUIPMENT SUPERVISOR CORY MINTON, coaching is his lifeblood. “If I won the Powerball lottery tomorrow, I’d still be a coach.”

By day, Minton oversees a group of 16 people whose mechanical skills support San Juan Basin production. “Our task is to keep the basin’s

molecules moving,” Cory said. “Honestly, we’re a bunch of mechanics. We take care of anything that rotates and is company owned, roughly 2,000 pieces of equipment — pumps, hydrocells, engines, compressors and so on. We pull gas out of the ground and put it into the pipeline.”

Cory honed his mechanical skills as a helicopter squadron boatswain’s mate aboard the USS

Valley Forge (CG50), a Ticonderoga-class guided missile cruiser.

Outside of work, his life seems to be all coaching — all the time. He serves on the board of directors for the Four Corners Young America Football League. He’s also the head coach of his son’s team; the core group has been together from second through seventh grades. Last season the team took second in the regional Super Bowl.

Cory has also been involved with girls’ softball and swimming and has coached the Aztec youth

wrestling program for the past seven seasons, along with assisting at the high school level. Aztec High School’s legendary wrestlers have won 15 state high school championships, including 12 consecutive titles during every year of the ‘90s — the greatest record in the annals of New Mexico high school wrestling.

Cory’s coaching philosophy is simple: “The only thing I ask is if they start, that they don’t quit. It’s not about the trophies or ribbons. Even if they don’t like their coach, I tell them, ‘You’re not always going to like your boss in the real world; you’ve got to work through it — never give up.’”

Through athletics, Cory sees children develop self-discipline, confidence and a sense of camaraderie. “I put a big emphasis on school, because you’re a student first. I’m a stickler about grades.”

Cory was nominated for the 2015 Citizen of the Year award in Aztec, a picturesque community of around 7,000 people 20 miles from the Colorado border. Voted in the top ten safest and most beautiful towns in New Mexico, it’s one of the triticies, along with Bloomfield and Farmington, that provide the human capital to support the work of the San Juan Basin. Everyone here has some connection to energy.

“Cory’s volunteering speaks volumes about what kind of person he is,” said Aztec Chamber of Commerce President Theresa Bailey. “When he gets off work, he’s at the football field, the gym or the diamond to help kids develop great life skills and winning attitudes. We need more people who are willing to dedicate their time to teach our kids what they may not get at home sitting in front of the TV.”

“Everybody wins when people of Cory’s caliber are so deeply committed to the Aztec community. Many of the kids that have been on his teams throughout the years still look up to him. He holds a special place in their hearts because of the great life lessons he’s taught.” ■



ABOVE: Cory on Aztec’s picturesque main street

OPPOSITE PAGE: Cory coaches his son Sammy Minton (left) and Hunter Riddick on the “take down.”



**AZTEC
WRESTLING**

AZTEC



Tori Parisi

The evolution of a scientific mind

BY GUS MORGAN

Tori kayaks on Higgins Lake in Michigan. Long active in sports and outdoor activities, her past athletic endeavors include basketball, lacrosse, field hockey and track. These days, Tori stays active by running, cycling, hiking, kayaking and surfing. She also practices yoga regularly.



THERE ARE DAYS WHEN TORI PARISI MISSES MICROBIOLOGY. It was her specialty, and she was comfortable in her role as a subject matter expert. But nearly four years ago, Tori stepped outside her comfort zone and transitioned from microbiologist to geochemist.

“I was terrified to switch my career,” said Tori, a senior geochemist with the Petroleum Geochemistry & Basin Modeling group. “But in science, there are first principles that carry over to whatever discipline you are in. My career switch has been a tremendous challenge and it has helped me excel.”

Tori joined ConocoPhillips in October 2011 as a microbiologist for the company’s bioenergy program, helping with projects involving microbial enhanced oil recovery, biogas and heavy oil to gas. But the business environment shifted soon after her arrival, and the bioenergy program was discontinued in May 2012.

Thus, Tori had reached a career crossroads. With a doctorate in microbiology from the University of Oklahoma and Harvard post-doctorate work under her belt, Tori had the option to depart ConocoPhillips with glowing recommendations and continue her career as a microbiologist elsewhere.

But another option was on the table. The company needed geochemists, and Tori’s educational background, tenacity and people skills put her in position to make such a bold transition. The

Petroleum Geochemistry & Basin Modeling team agreed to train Tori as an exploration geochemist, and Geoscience Fellow Brad Huizinga volunteered to mentor her during the transition.

Stepping up to the challenge, Tori decided to make the switch.

She realized microbiology and geochemistry shared similar techniques, including the use of biomarkers and mathematical interpretation methods. And she already knew how to operate and interpret data from a gas chromatograph-mass spectrometer, a key tool of the trade.

Tori was immediately put on projects, where she had to deliver results at the same time she was learning.

“The theme through my transition was for me not to be afraid to fail,” she said. “I had to be willing to ask questions when I didn’t know something, admit what I didn’t know and find people to work with who were supportive and wanted me to be successful.”

Reflecting on Tori’s transition, Brad said she acquired her skill set faster than anyone he has ever mentored and obtained an exceptional rating in geochemistry in a rapid timeframe.

Tori specializes in exploration and reservoir geochemistry, employing biomarkers and isotopic signatures to determine oil-source correlations, reservoir connectivity, fluid properties and source rock quality. She works with business units to provide fluid property predictions as part of a petroleum systems approach to new plays, maturing prospects and existing assets. Some of Tori’s most notable accomplishments include collaborative work helping with the Cassin oil discovery in the National Petroleum Reserve-Alaska, the Moraine oil field evaluation and more recently as lead geochemist for the deepwater Gulf of Mexico regional petroleum systems evaluation, as well as helping with ongoing exploration wells and appraisals. ■





Rufus Gandhi

Demonstrating the power of positivity

BY JAN HESTER, PHOTOGRAPHY BY KEN TAYLOR

RUFUS GANDHI BELIEVES IN FACING CHALLENGES with a positive attitude. Early in life, the married father of four defied overwhelming physical odds and now offers support to others facing similar challenges.

Born in London, Rufus lived and worked in New York, Los Angeles and Singapore before moving to Aberdeen in 2011. As senior legal counsel, he has worked for the ConocoPhillips U.K. business unit for a little over three years.

the odds shorten considerably if you need a non-family donor match. I was very lucky that my sister was a match."

He had such a positive outlook in life and to overcoming his illness that a minister who visited the hospital was surprised when she was greeted by a welcoming face each time she walked into the room. "After a few weeks of this, she finally took my mum aside and asked her if I had a developmental disability because I was seriously ill yet seemed so happy. Needless to say, she was politely asked not to return."

After his successful bone marrow transplant, Rufus helped found a counselors support team to visit cancer patients. "Often doctors try to describe side effects based on books or observations. If a counselor has been through what the patient is going through, there is a common bond established. I have been told by patients post-treatment that they began to see things differently the moment a survivor walked in. It made them realize that their diagnosis was not the end and that it was possible to get back to a normal life again."

Rufus' aim to live a normal life is seen through his passion for playing cricket. Back in 1993, his doctors told him he would not play cricket again. His determination to prove them wrong ensured he was back playing, albeit with comical results. "There are times when my legs become inadvertently uncoordinated as my brain messages do not reach them in time. I have been seen running, then toppling over as my back leg 'forgets' to come forward!"

In 2018 Rufus will celebrate 20 cancer-free years. He continues to encourage people to become bone marrow donors and to urge current patients to look forward to the future. In the words of the doctor who gave him his second five-year clearance, "I'm not quite sure what to say now, as I have never had a patient like you live this long. So enjoy it!" ■



OPPOSITE PAGE: Rufus plays competitively for the Stoneywood Dyce Cricket Club, where he serves as captain of the Strathmore & Perthshire premier league. The club is home to a number of current and former international Scottish players.

At 17 years old, Rufus was diagnosed with non-Hodgkin lymphoma, a type of cancer most common in adults. "The tumor had wrapped around my spine and left me paralyzed from the waist down." After surgery, chemotherapy and radiation, he had to learn to walk again. "It was an odd feeling to have your brain know what to do but your legs not actually responding!"

His "five-year all clear" turned out to be premature. In December 1997, Rufus was diagnosed with acute myeloid leukemia, a secondary cancer. His only chance for survival was a bone marrow transplant, which brought to his attention the shortage of bone marrow donors in the U.K. "There is only a 25 percent chance of finding a sibling match, and



ZOTI



1ST INTEGRATED
SAFETY CRITICAL SOLUTIONS

And the 2016 SPIRIT Awards go to . . .

Since 2001, the annual ConocoPhillips SPIRIT of Performance Awards have honored the individuals and teams who best exemplify the company's high standards in conducting business, guarding the safety and well-being of people and contributing to society. In 2015, one of the most difficult years the company has ever faced, employees met the challenges of uncertainty and change with strong resolve. Including representatives from business units, functions and staffs around the world, the 2016 award recipients reflect a workforce fiercely committed to success in the face of all odds.



In his annual message announcing the award winners, Chairman and CEO Ryan Lance wrote: "After careful consideration of more than 70 nominations, the Executive Leadership Team selected 32 teams we believe made the greatest relative impact by executing projects with a high degree of difficulty. These teams embraced our SPIRIT Values and demonstrated Accountability + Performance. We also selected four Lifesavers who went above and beyond to save a life in 2015, and one Process Safeguard, whose quick and decisive actions protected our people and operations. Finally, we selected two Individual Lifetime Achievement Award winners, both of whom

have long and inspirational histories of community service."

Among the winning teams, several directly addressed the difficult market conditions of declining commodity

"These teams embraced our SPIRIT Values and demonstrated Accountability + Performance." — RYAN LANCE

prices, including the Excellence Through People team that facilitated development moves and completed talent

management initiatives despite cost reduction efforts and realignments. The Deflation Capture team delivered tangible value to the company of more than \$700 million in capital expense and more than \$300 million in operating expense, an integral component of the company's plan to deliver significant cost savings in 2015 and 2016. And, of course, the Doing Business Better team delivered a 25 percent reduction in unit costs from 2014 to 2017, behavior changes and sustainable improvements in running the business.

The recipients in the Lifesaver, Process Safeguard and Individual Lifetime Achievement categories demonstrate



Throughout the year you will see this symbol in *spirit Magazine* and elsewhere to indicate that a team or individual has won a **2016 SPIRIT of Performance Award.**



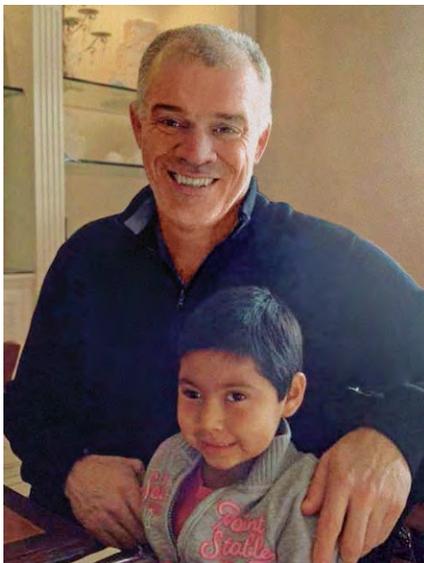
A life-long resident of the city of George West, 2016 Individual Lifetime Achievement Award winner Glynis Strause meets with Live Oak County Judge Jim Huff. When Huff first learned that the company had hired Glynis, he said, "I thought ConocoPhillips truly knew what they were doing."

through their choices and actions how ConocoPhillips people impact the lives of others. Nowhere is that more visible than in the Lifesaver category. Tim Homiston pulled an unconscious stranger from a burning car before its gas tank exploded. Curtis Myhovich rescued an elderly man with dementia on a remote road, where he was at risk of hypothermia. While on vacation in Mexico, Bryan Dickson saved an elderly person who had been swept into Hurricane Patricia's

committed to making a difference. Early in life, Larry McDougall lost a friend to leukemia and began his lifelong support of St. Jude's Hospital. He also helped found the Jeff Lucas Memorial, a nonprofit honoring a fallen comrade, and Gits for Kids, where he builds guitars for children fighting cancer. An educator before joining ConocoPhillips, Glynis Strause has been widely recognized by

state and local officials for her commitment to community improvement. In addition to being a strong advocate for education, she has been instrumental in the renovation of the Dobie West Performing Arts Theatre and the George West cemetery.

In lieu of an awards presentation event, ConocoPhillips will honor recipients throughout the year. ■



Larry McDougall with Emma, one of his Gits for Kids guitar recipients

deadly storm surge. Rafael E. Paz Lopez saved his young daughter from choking by using special techniques he learned through CPR training.

This year's Process Safeguard award winner demonstrates the value of doing the right thing. During a hydro-test demonstration, Ossama Bayoumy noticed a flawed component and the lack of a barrier between the test area and an area with people working. Bayoumy took decisive action to initiate a stop-work notification, ensuring that the weak component was replaced and the area cleared of personnel until after the test.

This year's Individual Lifetime Achievement award recipients have long been



SAFETY

- Canada Safety Performance (Canada)
- Eagle Ford Completions (Lower 48)
- Norway HSE (Norway)
- JHA/TRA Risk Reduction (T&P)
- Bayu-Undan Asset Integrity Maintenance Campaign (ABU West)

PEOPLE

- Energy Center Project (HR)
- Excellence Through People (HR)
- The Brand: Accountability + Performance (IR&C)

INTEGRITY

- ABUE Indigenous Content (ABU East)
- Creating Community Advocates - Eagle Ford (Lower 48)

RESPONSIBILITY

- WALFA Team (ABU West)
- Avian Species Habitat (Lower 48)

INNOVATION

- Compressive Seismic Imaging (T&P)
- Eagle Ford Maurer Pilot (Lower 48)
- U.K. Well Abandonment: Cost/Schedule Step Change (U.K.)
- Managed Pressure Drilling (Wells)
- Deflation Capture (Supply Chain)

TEAMWORK

- Surmont 2 Commissioning and Start-up (Canada)
- Crude and Eagle Ford Condensate Export Advocacy (GA/Commercial)
- Senegal Drilling Excellence (Wells)
- Colombia Acreage and Contract Capture (Exploration)
- Dalton Highway Flood Response (Alaska)
- Bohai Field Pressure Prediction and Well Design (China)
- Lower 48 and Alaska Land Management System (Finance)

BUSINESS EXCELLENCE

- Global Strategic Disposition (A&D)
- Alaska Drillsites Execution (Alaska)
- Eldfisk II (Norway)
- LNG Technology, Licensing, Engineering, & Operations (Commercial/T&P)
- Doing Business Better (DBB)
- San Juan Gas Transportation Negotiation (Commercial)
- Resource and Cost of Supply (T&P)

WELLNESS

- Teesside (Norway)
- (Runner-up) Activity Angola (Angola)

LIFESAVERS

- Tim Homiston (Lower 48)
- Curtis Myhovich (Canada)
- Bryan Dickson (Polar Tankers)
- Rafael E. Paz Lopez (Alaska)

- PROCESS SAFEGUARD**
- Ossama Bayoumy (Canada)

INDIVIDUAL LIFETIME ACHIEVEMENT

- Larry McDougall (Global Marine)
- Glynis Strause (Lower 48)



PHOTO COURTESY OF NUSTAR

With 40-year ban lifted, ConocoPhillips ships first exported U.S. crude

BY DAREN BEAUDO

What is believed to be the **first cargo of U.S. crude oil exported overseas** after the lifting of a 1970s-era ban left the docks of Corpus Christi, Texas on New Year's Eve 2015. While many Americans were preparing to ring in the New Year unaware of this policy milestone, the men and women of ConocoPhillips who helped make that cargo possible were quietly cheering.

ConocoPhillips won't be noted in the history books as the first *exporter* of crude after the lifting of the ban (that honor goes to the customer, Vitol), but the company supplied the cargo. The oil came from the company's leases in the Eagle Ford fields of South Texas, the very crude that has helped lead to an energy renaissance in America: Eagle Ford Light Common Stream, a blend of processed and unprocessed lease condensate or crude oil with an API gravity between 45 and 55 degrees.

The ship that carried the first cargo, the *Theo T*, is a Bahamian-flagged Panamax crude tanker built in 2003. Like a game of "Where's Waldo?" the media speculated

that the *Theo T* would deliver cargo to Italy, then to Germany. On Jan. 20, it finally offloaded its cargo in Fos-sur-Mer, France (near Marseille), with the crude likely headed to a refinery in Switzerland.

ConocoPhillips worked with industry coalitions such as Producers for American Crude Exports (PACE) and the American Petroleum Institute to inform and advocate for ending the ban. While the policy decisions seemed right, the politics were not always encouraging. The effort required hundreds of policy-maker information meetings, sharing of numerous key studies, speeches, media interviews and even testimony in front of a Senate committee.

The event marked the culmination of more than a year's worth of work making the case to allow for crude oil exports.

"We hear all the time that Washington is broken," said Andrew Lundquist, senior vice president, Government Affairs. "But on crude oil exports a funny thing happened: Washington worked. An issue of tremendous importance to a highly politicized industry passed the Congress with bipartisan support. We reversed 40 years of policy with a strong,

comprehensive and transparent legislative advocacy and communications strategy expertly executed by ConocoPhillips and the PACE coalition."

From ConocoPhillips' Government Affairs team, the Chief Economist's Office, Commercial and Investor Relations & Communications, all the way to Chairman and CEO Ryan Lance's office, the event marked the culmination of more than a year's worth of work making the case to allow for crude oil exports with politicians, business people, employees, academics, contractors and the general public.

The effort began in early 2014 with the formation of a team to end the ban. It was facilitated by numerous third-party, independent studies from reputable "think tanks" that almost unanimously agreed lifting the ban on crude exports would have a positive impact on the U.S. economy, provide jobs and tax revenues,

and perhaps, most important, not raise or possibly even lower gasoline prices for consumers.

With the unwavering commitment and leadership of several key members of both political parties in the U.S. House and Senate, the ban was lifted as part of a comprehensive spending bill on Dec. 18. ■

ConocoPhillips, Tierra Resources receive climate change award

BY DAVID AUSTIN

ConocoPhillips and Tierra Resources recently received the Climate Change Business Journal's 2015 Business Achievement Award for their efforts to preserve Louisiana's coastal wetlands.

As the largest private wetlands owner in the country — with an estimated 636,000 acres along Louisiana's Gulf Coast — ConocoPhillips teamed up with Tierra Resources on a three-year pilot project to help restore and preserve the critical habitat.

The innovative project focused on using crop duster planes to spread mangrove seeds throughout the area. Native to Louisiana, mangrove trees thrive in the wetlands' saltwater environment, and the trees' complex root system helps to stabilize the soil and prevent erosion. In addition, they protect the fish and seafood habitat and slow damaging floods that can result from storms.

Louisiana's wetlands are vital to the state's economy, yet they are vanishing at an estimated rate of the equivalent of a football field every hour.

The Climate Change Business Journal will formally present this and other annual awards during its 2015 Business Achievement Awards banquet in March.

"ConocoPhillips was the first landowner to use aerial application to plant mangrove propagules in Louisiana," noted Phil Precht, ConocoPhillips director of Coastal Wetlands. "I am very proud of our success on this project. It's a credit to the support of ConocoPhillips management and to the company's commitment to environmental stewardship."

The success of the project can be seen on a number of levels. Mangrove trees have long been noted for the good they can do for the Louisiana wetlands. But prior to the aerial seeding technique featured in the pilot project, the common way to plant

them was to send people out by boat to plant the seedlings by hand. An expensive process, it proved to be highly inefficient, slow and arduous. By comparison, the crop dusters can cover wide swaths of wetlands, dropping and ultimately planting seeds in a fraction of the time at a significant savings. Studies by Tierra Resources show that air seeding costs an estimated three percent of the budget needed for traditional mangrove restoration.

Beyond Louisiana, wetland protection is important to the nation's economy. Information provided by Tierra Resources shows that wetlands along the Mississippi River Delta, including those in Louisiana, contribute tens of billions of dollars to the U.S. economy every year and support millions of



jobs. Thus, any effort to help preserve and restore them, such as the innovative mangrove tree pilot project, is worthy of praise.

Representatives from both ConocoPhillips and Tierra Resources managed the award-winning project. Maxine Madison managed the project for three years as part of ConocoPhillips' Environmental Assurance group prior to moving into her current role as a regulatory coordinator for the company's Mid-Continent business unit. Sarah Mack managed the project for Tierra Resources.

"It's been an honor to work on this innovative project and have our efforts to preserve our coastal wetlands recognized by the Climate Change Business Journal," Madison said. "We're pleased that we're able to conserve our property while also reducing costs." ■

ConocoPhillips leaders contribute during CERAWEEK 2016

Five ConocoPhillips representatives participated in key dialogue sessions regarding the energy industry during CERAWEEK 2016 – known as the Super Bowl of the oil and gas industry – at the Hilton Americas in downtown Houston Feb. 22-26.

Chairman and Chief Executive Officer Ryan Lance participated in a CEO plenary, while Matt Fox, executive vice president, Exploration & Production, took part in a discussion on the North American upstream industry.

Also contributing were Steinar Vaage, senior vice president, Operations & Projects Services; Sabrina Watkins, manager, Sustainable Development; and Greg Leveille, Chief Technology Officer.

Vaage took part in discussions on engineering standardization and the role technology plays in major projects and raising capital efficiency. Watkins participated in a discussion on how the Paris climate conference will impact the energy sector, and Leveille contributed to a session on North American shale.

For 35 years, the conference has attracted energy industry leaders, experts, government officials and policymakers, along with leaders from the technology, financial and industrial communities – and energy technology innovators. This year's theme, "Energy Transition: Strategies for a New World," focused on responses to low prices; what's ahead for markets, investment, costs and technology; the 2015 Paris climate agreement; emerging competitive strategies and industry structure; and regulatory policy and geopolitics. ■

Exploring the fracture frontier

Experts study Eagle Ford core to learn more about stimulated rock volume

BY GUS MORGAN AND SETH BUSETTI

The Subsurface organization hosted a reservoir optimization workshop Dec. 16–17 in Houston to help their colleagues better understand stimulated rock volume (SRV) in unconventional reservoirs.

The two-day workshop consisted of five sessions, and participants included managers, reservoir engineers, drilling engineers, completion engineers, petrophysicists, geologists and geophysicists. The workshop was considered a collaborative success, with more than 100 participants.

“There’s nothing like touching, feeling and seeing the SRV to get an understanding of the reservoir properties that we should be putting into our reservoir models, workflows and interpretations.”

— HELEN FARRELL

Helen Farrell, who served as the project coordinator during the planning and data acquisition phases, said the purpose of the core workshop was to let people working in unconventional plays see what SRV is actually like.

“There’s nothing like touching, feeling and seeing the SRV to get an understanding of the reservoir properties that we should be putting into our models, workflows and interpretations,” she said.

A 120-foot long, 3-inch diameter core sample taken from the Eagle Ford Seidel SRV pilot was the main attraction. The core, cut into 3-foot sections, was laid out on tables in the laboratory. A formation micro-imaging (FMI) log over the cored interval was placed next to the core, showing the matched hydraulic fractures in the rock to the same ones measured with downhole logging tools. This visual

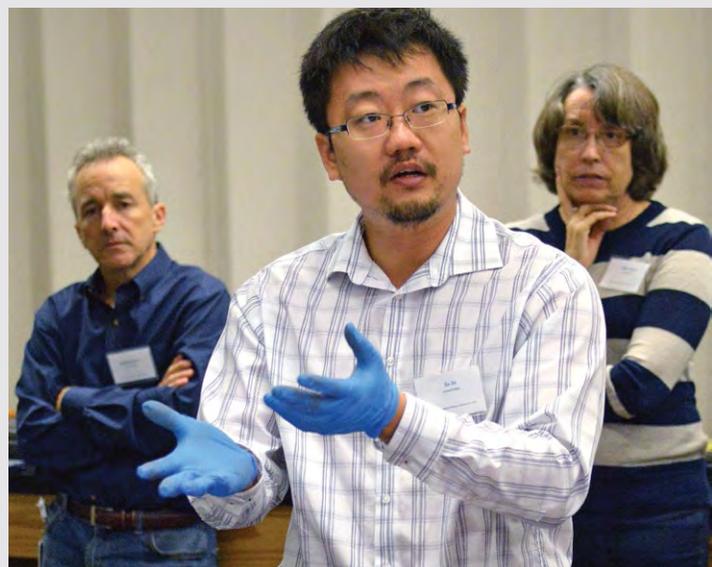
reconciliation was vital to being able to interpret all of the fractures, and it also helped workshop participants calibrate their eyes to what hydraulic fractures look like in the two data types. Hand lenses and optical microscopes were made available to participants so they could view the hydraulic fracture surfaces with magnification, allowing them to experience some of the detailed microscopy work being done in the Bartlesville laboratories.

After having a chance to examine the core and observe the fractures in the rock, participants engaged in cross-disciplinary discussions about the SRV and how it differed from their preconceptions. The conversations ranged from observing differences in what actual hydraulic fractures look like versus modeled idealizations, to comparing completions design and infill drilling practices in different assets, to reviewing reservoir performance forecasting and development strategies, and there were even some rigorous technical discussions on complex hydromechanical coupling and fracture mechanics.

WHAT IS THE SRV PILOT?

The SRV pilot is a multi-year, multi-well study designed to strategically sample and characterize the Eagle Ford SRV. In many ways, the Eagle Ford was the perfect testing ground to learn more about

SRV because the acreage and resources were already in place, and the Eagle Ford asset has been a template for success in the company’s other unconventional assets. The pilot effort has been a tremendous collaborative success, and every step of the process has required innovative solutions spanning multiple ConocoPhillips organizations. Some significant areas requiring advanced



CLOCKWISE FROM ABOVE: Ge Jin, geophysicist, discusses the Seidel core sample with colleagues during the workshop session, while flanked by Stephen Bohnet, Eagle Ford development manager, and Helen Farrell, pilot projects manager. The SRV pilot was the last major project for Farrell, who recently retired; A piece of the Seidel core sample; Dana Jurick, manager for seismic analysis, uses a hand lens to examine a core sample; Principal Reservoir Engineer Kevin Raterman, right, discusses the Seidel core sample with Senior Reservoir Engineer Logan Warren during a workshop session at Core Lab.

solutions beyond what is typical included well planning, drilling and mud system design, directional drilling, downhole tool deployment, as well as scientific analysis and modeling. At several stages of the project new operating workflows and specialized analysis software had to be developed to deal with the new challenges. The novel pilot data package includes data from five horizontal drill-through wells with a range of instrumentation including horizontal core and image logs, microseismic, distributed thermal sensing (DTS), distributed acoustic sensing (DAS), and numerous pressure gauges.

WHY IS SRV IMPORTANT?

The SRV describes the region of productivity enhancement that occurs when completion engineers hydraulically fracture the reservoir. The hydraulic stimulation occurs sequentially along the lateral length of the wellbore in separate stages, and is accomplished by injecting a pressurized slurry of water and proppant (small sand grains) from a

improves as the fractures within the SRV become more effective at draining the matrix. Recovery can be accelerated and drainage efficiency improved if more fracture network surface area is created within the SRV, and if the flow paths are made more conductive with proppant. However, to yield the most economic value, this enhancement must be strategically balanced against completion

costs and development criteria, such as well spacing, lateral well lengths, etc. By learning more about the SRV, unconventional reservoir asset teams will be able to make better decisions about field development and reservoir performance.

Unconventional reservoirs like the Eagle Ford are relatively new compared to conventional assets, and the industry is still working to understand the details for how they work. The only way for experts to learn more about SRV characteristics is to build on the field experience and to continue to collect and analyze strategic field data.

industry modeling tools."

To incorporate the new findings, Eagle Ford employees are already making operational changes, most recently by reducing the spacing between perforation clusters. While observations have led to immediate insight, understanding the collected data's relationship to how the SRV is draining will come over the next six to 12 months. Specifically, as the pressure evolves, it will be clearer how the field is draining over time, and what actions the company can take to be more efficient with its field development.

WHAT'S NEXT?

Now that the company's experts have an immense, high-quality data set involving completions and reservoir engineering work, they will work to understand the impact of what they've seen on reservoir drainage and how it affects well spacing and completions. The core and image log interpretation have been used to document the hydraulic fracture intersections and work has begun to synthesize it with the rest of the pilot data, with the goal to implement the most important findings in 2-D and 3-D models.

Kevin Raterman leads the SRV pilot production simulation effort and describes the initiative to try alternative modeling approaches that include "variants of a single fracture, multiple fractures and fracture networks ... compared in multiple diagnostic spaces."

Experts on the various technical teams have been careful to say that there is still a lot of work to do in the upcoming year to analyze the data and synthesize results, which will undoubtedly be studied for years to come. But all agree that the progress to this point has been remarkable and the business uptake has been an overwhelming success. As the teams continue to understand and communicate what happens to the rocks during the completions, they are able to optimize the process by increasing production while decreasing costs, in the Eagle Ford as well as ConocoPhillips' other unconventional reservoirs. ■



series of perforations located along what will become the producing well.

Whereas the matrix permeability of most unconventional reservoir rocks is too low for hydrocarbons to flow at economic rates, the SRV has a much higher permeability. This is because it is comprised of numerous hydraulic fractures that spread away from the wellbore, in many cases connecting to the natural fracture system, which differs depending on the geologic location. It is the overall connected fracture network that increases the rock's effective permeability, allowing hydrocarbons to flow. Thus, hydrocarbon recovery

LEARNINGS AND INSIGHT

The SRV pilot project has yielded some important and vivid information — information that indicates that several industry paradigms about how hydraulic fracturing works need to be modified or in some cases discarded.

Ray Reid, who is ConocoPhillips' leading expert on image log interpretation, served as the lead on fracture interpretation from the SRV pilot FMI.

"There was considerable anticipation as the first stimulated core and image logs were acquired," Reid said. "The resultant fracture images and core indicated vastly different propagation from

'Captain for a Day' program earns high praise and supports a great cause

BY DAVID AUSTIN

WHILE PERUSING AVAILABLE AUCTION ITEMS, NOAH ALTMAN'S EYE LANDED ON SOMETHING OF INTEREST.

The item, "Captain for a Day," offered an in-depth experience with ConocoPhillips' Global Aviation Services (GAS) team. The eWay Auction benefits the United Way and its member agencies, so Altman liked the idea of giving to a good cause while enjoying a special day.

The Bartlesville, Oklahoma-based

members of the GAS team at the Bartlesville Municipal Airport and reviewed the safety checklist with them before his 7 a.m. departure aboard the OK-TX Air Shuttle, which makes approximately eight roundtrips per week between Bartlesville and Houston. Instead of flying in the cabin with the other passengers, Altman sat in the cockpit jump seat, enjoying a panoramic view as well as an opportunity to see the pilots at work.

certain things and a greater knowledge about Aviation."

After his morning with GAS staff, Altman enjoyed lunch with Fellows and Nordic before taking a few spins in a flight simulator donated by Flight Safety International.

"The graphics are pretty incredible," Altman said, who chose flights into and out of New York, San Francisco and Aspen, Colo. "It's a full motion simulator, and I managed to not crash. So, I was happy about that."

Fellows and Nordic are pleased with the enthusiasm inspired by their second-year program.

"I think it's an amazing program," Fellows said. "It benefits a great cause, and while our 'captain' learns a lot about us, we learn about them as well. Noah is a great guy, and he knows a lot about tax law."

"It's a fantastic program.

If you are interested in aviation at all, this is one of those things that you've got to do." — NOAH ALTMAN

Altman returned to the hangar for the evening flight back to Bartlesville. As the shuttle made its way north, Altman was again in the jump seat — a perfect perch.

"The main thing that struck me is how much time and effort they put into the program," Altman said. "It's fantastic. If you are interested in aviation at all, this is one of those things that you've got to do."

The "Captain for a Day" program will return for a third year this fall, in Bartlesville's 2016 United Way campaign.

"The winning bidder will get to enjoy a unique experience," said Doug Schwartz, manager, GAS. "We're very proud of the fact that we are supporting the United Way and the great work that it does." ■



An accounting/financial analyst based in Bartlesville, Okla., Noah Altman was Global Aviation Services' "Captain for a Day" on Nov. 18.

accounting/financial analyst has long had a passion for aviation. Altman grew up in Israel and has traveled often.

"I figured it was a once-in-a-lifetime opportunity," Altman said. "So when I saw the package, I decided I would be the winning bidder."

Altman's "Captain for a Day" experience took place on Nov. 18. He met

Once in Houston, Altman was given a tour of the company's hangars at George Bush Intercontinental Airport, accompanied by the lead organizers of the event, Assistant Chief Pilot Jeff Fellows and Lead Flight Attendant Amy Nordic.

"It was fun to see Noah interact with our aviation staff," Nordic said. "He gained an understanding of why we do



One of the “Texas Raiders” B-17 wing, a vintage World War II era bomber added to the atmosphere of the United Way Aviation BBQ, held Dec. 8 in Houston.

Aviation United Way BBQ fundraising event is a soaring success

BY DAVID AUSTIN

As the event continues to grow, there’s a running joke that ConocoPhillips’ United Way Aviation BBQ has gotten so popular that Houston Texans football star J.J. Watt might need to make a special appearance.

“I don’t know if that’s realistic,” laughed Grant Barto, associate analyst, Global Aviation Services (GAS) and one of the leading organizers of the event, “but we are very happy with how the BBQ has progressed.”

The third annual event, held Dec. 8, drew more than 250 people and raised nearly \$24,000 for the Houston area United Way and its member agencies. Attendees took part in drawings and a silent auction.

During the event, 1940s-era swing music filled the air, casting a spotlight on a vintage B-17 bomber that saw action in the latter stages of World War II. One of the “Texas Raiders” wing and part of the Commemorative Air Force, the restored bomber is one of just nine B-17s still flying. Attendees could bid for tours of the aircraft as part of the silent auction.

“I’m proud of our GAS team for putting together such an impressive event,” said GAS Manager Doug Schwartz. “Participants were very generous.”

Key to the event’s success were GAS planning team members Rosalind Derrick, aviation analyst; David Camille, HSE manager; Aneela Roger, aviation

safety assurance analyst; Kelsey Willrodt, administrative assistant; and Barto. Preparation began months ago, and the team challenged itself to improve upon the previous two highly successful events. The fundraising total of nearly \$24,000 was a new best for the event.

“The BBQ is a good way to give money to an excellent cause,” Camille said. “And we look forward to improving next year.”

The appearance of the B-17 bomber was the result of a relationship that developed after ConocoPhillips donated some heavy aviation machinery to the Commemorative Air Force, a Texas-based nonprofit organization dedicated to preserving and showcasing historical aircraft. While the equipment had become outdated for use with modern aircraft, it was perfect for some of the classic aircraft flown by the Commemorative Air Force. During the event, the group donated eight rides aboard the bomber, raising an estimated \$3,000.

“I thought it was a wonderful event,” Roger said. “We raised quite a bit of money, and everyone had fun doing it.”

Next year the team hopes to raise more money, increase attendance and perhaps get a return appearance by the “Texas Raiders.”

“We hope to keep growing what has become a great event,” said Derrick. ■

Rodeo Run helps fund scholarships

The ConocoPhillips Rodeo Run has been energizing the Houston community since 1988. And it’s still going strong.

This year, thousands of runners and walkers gathered in downtown Houston the morning of Feb. 27 to take part in the 2016 ConocoPhillips Rodeo Run, a Texas-sized fundraiser for education. The event featured a 10K race and a 5K fun run/walk, along with a costume contest and post-race party. More than 1,000 ConocoPhillips employees, contractors and retiree volunteers, as well as their family members and friends, supported this year’s event.

All the registration fees from the event will go to the Houston Livestock Show & Rodeo Educational Fund, which provides scholarships to Texas students. The 2015 event raised more than \$400,000 for the HLS&R Educational Fund. For 2016, these funds will be used to create more than 200 four-year scholarships for outstanding students from Houston-area public school districts in Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery and Waller Counties.

“We’re proud that 100 percent of our registration fees support college scholarships,” said Human Resources General Manager and Rodeo Run Chair Heather Sirdashney. “The ConocoPhillips Rodeo Run helps deserving students fulfill their dream of going to college. Helping students achieve their goals and making their college dreams a reality is a worthwhile cause and a rewarding experience.”

Lucas Bazemore, who is studying industrial distribution in the College of Engineering at Texas A&M University, said the HLS&R scholarship he received in 2013 has allowed him to focus on his studies instead of worrying about money.

“This scholarship has been very helpful to me,” said Bazemore. “Having a lot of my expenses taken care of means that I’m able to develop myself and concentrate on the things that will benefit me in the long run.” ■



Lucas Bazemore

Supply Chain awarded for excellence and collaboration

ConocoPhillips was recognized for procurement excellence and external collaboration at the Procurement Leaders Awards 2015 Asia Pacific. The judging panel comprised senior procurement executives from a range of industries and regions.

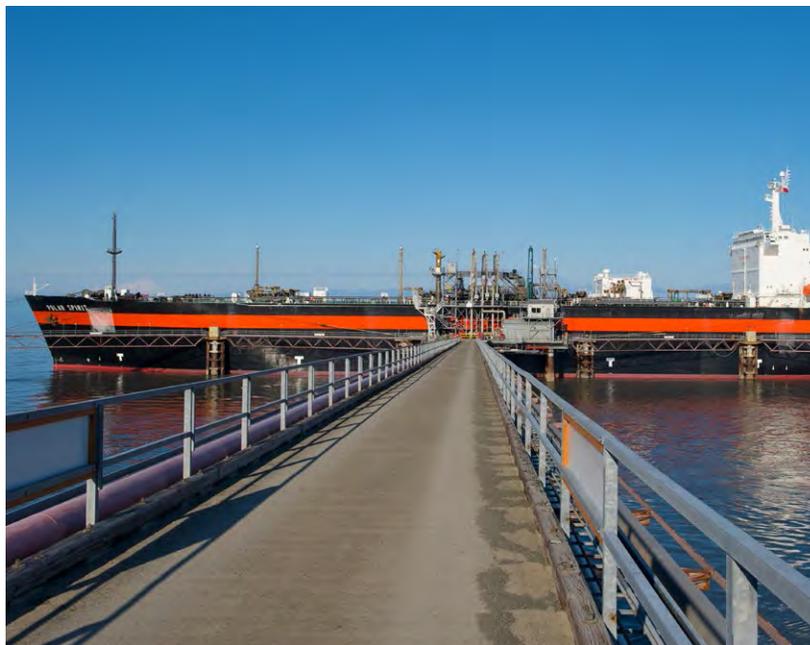
The company was applauded for quick development and expert execution of its sustainable cost-reduction plan. Keys to success included “executive leadership exhibited at the highest level, the ability to identify categories for ‘smart negotiation’ and the use of joint ventures to initiate and drive cost reduction.”

Many strategies and tools were instrumental in achieving this cost-saving success, including a negotiation plan developed by Supply Chain to capture cost deflation resulting from weakness in commodities prices and the supply/demand market. Using this knowledge with Asia Pacific rig operators yielded a 30 percent savings in 2015 (equivalent to \$12.4 million).

Supply Chain successfully used supplier relationships to generate win-win solutions. For example, instead of demobilizing a rig and paying the moving cost (\$3 million to \$7 million), they worked with the supplier to keep the rig onsite at reduced manning and rate. The demobilization budget was used to fund continual use of the rig for modification works, which would not have been economically feasible otherwise.

Contributions the company makes to its joint-venture (JV) partnerships helped overcome the challenges of influencing without operatorship. The company achieved significant cost savings through formal secondment of employees into JV organizations, sharing market intelligence to support JV negotiations, and conducting joint negotiations with partners to achieve competitive prices. The JVs with Origin Energy, CNOOC and Petronas are examples of these approaches delivering positive results.

“Together with the business units and suppliers, the global Supply Chain team worked tirelessly to capture deflation and achieve sustainable cost savings for the company,” said Bill Bullock, president, Asia Pacific & Middle East. “I am pleased that the Asia Pacific team’s achievement is being recognized by their peers in the region.” ■



Kenai LNG plant is granted two-year export license extension

The U.S. Department of Energy (DOE) recently approved a two-year extension of ConocoPhillips’ license to export liquefied natural gas (LNG) from its Kenai terminal on Alaska’s Cook Inlet. The license now continues to Feb. 18, 2018. During that period, the company is allowed to export up to 40 billion cubic feet of LNG.

The Kenai LNG facility was opened in 1969 and, for more than three decades, produced approximately 220 million cubic feet a day (MMCFD), with an average of 32 cargo deliveries by tanker to Japan per year. With no natural resources of its own and air quality issues associated with the use of coal, the country needed fuel for electricity generation, heating and industrial use.

In the early 2000s, the supply of natural gas in the Cook Inlet began to decline, and the plant was reduced to half rate, with fewer cargos per year. The decision was made to begin the process of mothballing the plant, when the powerful 2011 earthquake in eastern Japan forced the nation to shut down its nuclear power plants.

As a result, the price of LNG increased dramatically in a short

period of time. The Kenai LNG plant remained in operation in 2011 and 2012 and was idled in March 2013. It resumed operations at half rate in March 2014, producing roughly 120 MMCFD and delivering five cargos to Japan by the end of the year.

In granting the license extension, DOE determined that Kenai LNG exports would not impact the availability of natural gas for south central Alaska, since local utilities have sufficient supplies under contract to meet their needs during the period of the license extension.

Beginning the winter of 2013, the Kenai LNG team initiated a program to provide natural gas to the utility Fairbanks Natural Gas to bolster gas supplies for the city of Kenai. ConocoPhillips delivered 65 tank loads of LNG to Fairbanks Natural Gas in 2014 and two tank truck loads in 2015. ■

Viking field production comes to an end

On the evening of Sunday, Jan. 17, Operations Team Lead Brian Bellamy marked the end of an era by initiating a stop on platform BC2, effectively ending the production of one of ConocoPhillips' main legacy assets.

In 1965, gas flowed for the first time from a Viking reservoir in the Southern

for the company, and the great people onboard have made it something very special," said Bellamy.

The first exploration well in the Viking area flowed on test at 3.6 million standard cubic feet of gas per day and 50 barrels of water per hour. The well was later determined to be on the edge of the yet



North Sea, with production commencing in 1972. To date, the Viking transportation system has produced approximately 3.26 trillion cubic feet of gas.

Bellamy, who spent the past 31 years working on the Viking A and B platforms, helped the team safely manage the work throughout the production shutdown period.

"Viking has truly been a legacy asset

to be discovered Viking B field. Further exploration wells were drilled through 1973, including the Viking A discovery well in 1969. Development of Viking commenced in 1971 with installation of the Viking A complex and the laying of a pipeline to onshore facilities at the Theddlethorpe Gas Terminal.

By 1977 further reservoirs in the A field, as well as Viking B, C, D and E fields, had

been developed. In 1998 a Viking redevelopment project led to production from additional reservoirs in the A and E fields.

Between 1965 and 2000, 24 exploration and appraisal and 58 development wells and sidetracks were drilled at Viking. Gas was produced via 13 wellhead and riser platforms, utilizing 51 kilometers of infield pipelines and 138 kilometers of Viking trunk line.

The Viking fields produced for more than 43 years. At its peak in 1977, Viking was producing 406 million standard cubic feet of gas per day, around 10 percent of the U.K.'s total production.

As one milestone comes to an end, another chapter starts with decommissioning. The team is committed to completing the next project as professionally and safely as they did throughout the production years. ■

ConocoPhillips Global Water Sustainability Center hosts U.S. ambassador to Qatar

During Discover America Week Qatar 2016, the Doha-based Global Water Sustainability Center (GWSC) hosted U.S. Ambassador Dana Shell Smith for a special tour of its facilities. The second annual event, held February 15-22, celebrated the partnership between the U.S. and Qatar.

"It is rewarding to see American companies contribute to research and development, as well as social responsibility efforts, as they develop their businesses abroad," said Ambassador Smith. "ConocoPhillips is taking important steps to promote water



conservation, water security and education in Qatar to ensure that future generations continue to prosper."

In addition to touring the visitor center, the ambassador and her delegation met with GWSC's team of scientists and engineers to learn more

about the team's advanced treatment and analytical capabilities. ■

Joining a group of students at the GWSC visitor are, from left: Samer Adham, manager, Water Solutions; Gary Sykes, president, ConocoPhillips Qatar; Ambassador Dana Shell Smith; and Hamad Al Kuwari, managing director, Qatar Science & Technology Park.

spirit

On Assignment

AMY BURNETT (*Achieving the impossible in Alaska, Page 10*) joined ConocoPhillips Alaska in August 2007. As a communications specialist, Amy's diverse list of responsibilities includes HSE, Cook Inlet and employee communications, Alaska publications and serving as backup spokesperson. With more than 20 years' experience as a professional communicator, Amy was a newspaper reporter when having a computer was a novelty, and she has held public relations positions in the tourism and affordable housing industries. Amy graduated from the University of Puget Sound in Tacoma, Washington with a degree in English/professional writing. A longtime member and past president of the Alaska Chapter of Public Relations Society of America, she currently serves on the chapter board of directors and chairs the Board Development Committee. Amy has been married to her husband Rich for 10 years and has two grown stepsons.



MEREDITH KENNY (*Village outreach demonstrates community investment, Page 18*) is a communications specialist in the media and advertising group for the Alaska business unit. She joined ConocoPhillips in 2014 and has worked to develop the Alaska business unit's social media program as well as using other digital outlets to communicate with both the public and employees. Prior to joining ConocoPhillips, she worked in political communications for both elected officials and candidates. Meredith is a graduate of Saint Joseph's University in Philadelphia, Pennsylvania.



MICHELLE MCCULLAGH (*Surmont 2: Launching a 50-year legacy, Page 34*) joined ConocoPhillips almost 10 years ago and has worked extensively with HSE and Communications, both in the field and the office. In her current role, she coordinates communications efforts for employee engagement, Wellness, HR, Office Services and Operations for both Surmont and Western Canada. She is also a regular contributor of internal content and works with employee networks. Michelle is particularly proud to have been involved each step of the way as Surmont 2 came to life, including co-creating the Building Surmont documentary. Michelle's background is in journalism, but she is grateful to have spent many years with the HSE team in Canada. When she isn't spending her time bending the written word to her will, Michelle loves family time, reading and visiting the CPC Wellness Centre.



ADRIANNA RUIZ (*Collaboration in the cloud: Office 365 will reduce costs and boost productivity, Page 40*) works in IT Infrastructure & Operations as an organization change management specialist. She joined ConocoPhillips in 2013 and has supported communications efforts for IT strategy and global software implementations. Adrianna currently leads communications supporting the Microsoft Office 365 rollout. She received a Bachelor of Arts in international relations from the University of St. Thomas in Houston. In her spare time, Adrianna enjoys traveling, cooking for family and friends and dance fitness training.



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LET'S TALK SAFETY: 8 rules to *live* by!

"The Life Saving Rules help us integrate our safety requirements, standards and expectations into the day-to-day operations involved with utilizing a state-of-the-art sixth generation drillship to drill deepwater wells in the Gulf of Mexico."



Life Saving Rules



Obtain authorization before entering a confined space.



Protect yourself against a fall when working at height.



Follow safe lifting operations and do not walk under a suspended load.



Obtain authorization around equipment.



Obtain authorization before bypassing safety protection or equipment.



Craig Fraser
Captain/Offshore
Installation Manager,
Maersk Valiant

Life Saving Rules



Our workforce drilling in deepwater Gulf of Mexico understands the power of the Life Saving Rules. Captain Fraser and other safety leaders are visible on the drillship and encourage open, two-way communication. The Life Saving Rules are helping to shape our safety culture and drive improved safety performance. It's the way we work, around the world.

Compressive Seismic Imaging

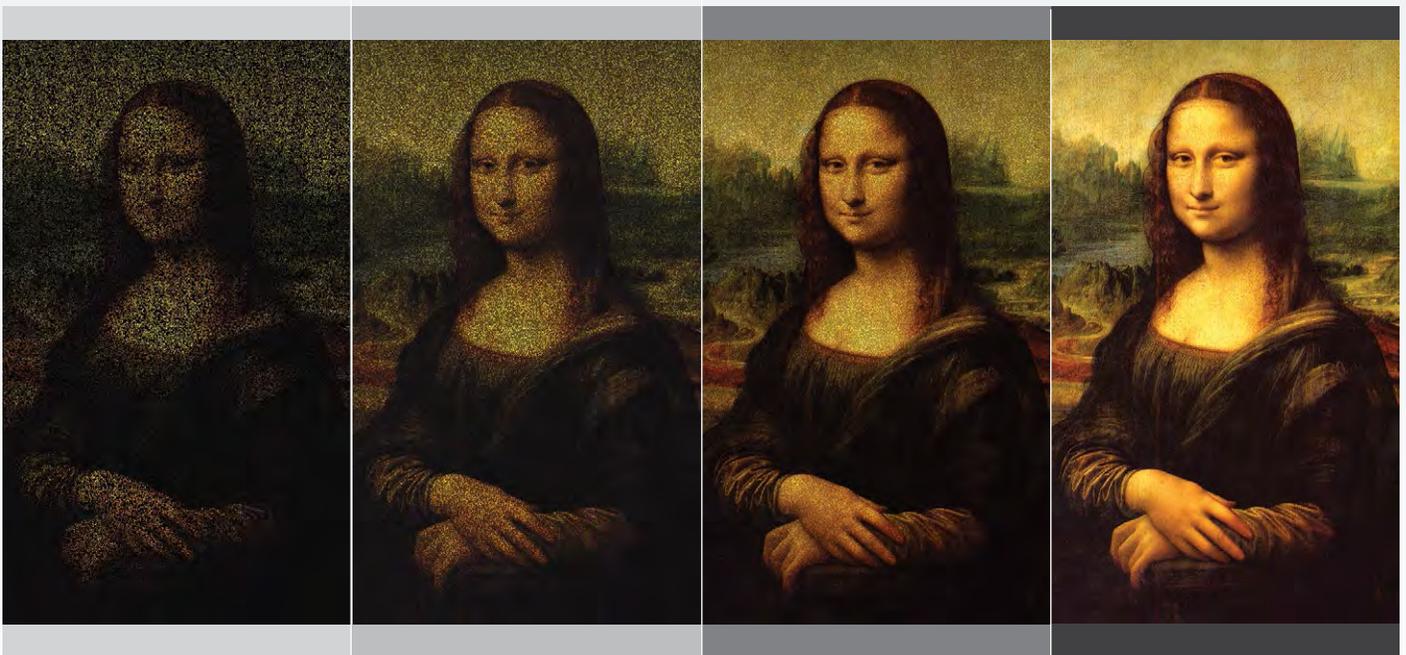
BETTER data, **FASTER** acquisition, **CHEAPER** cost

- Reshapes the way geoscientists approach seismic acquisition and the balance between cost and data quality
- Is based on compressive sensing, a mathematical theory that turns low resolution data into high resolution images
- Reconstructs a near perfect image using the fewest points and simplest shapes and data values

Compared to conventional modern seismic survey design, CSI can:

- Acquire the same data faster (and therefore cheaper)
- Cover a larger area in a given period of time at the same price
- Conduct an extremely high-quality survey at the same price

How compressive sensing completes the image:



1. Undersample

Using CSI technology, the team acquires a small fraction of the data required for traditional seismic methods.

2. Initial guess

The CSI algorithm captures general information about the data and fills in gaps with initial guesses.

3. Iterate

The algorithm then begins to construct the image, improving it at each iteration by modifying the data with the simplest possible shapes and values.

4. Achieve clarity

After several iterations, the algorithm creates an image almost identical to what it would reflect had seismic data been acquired at all locations.