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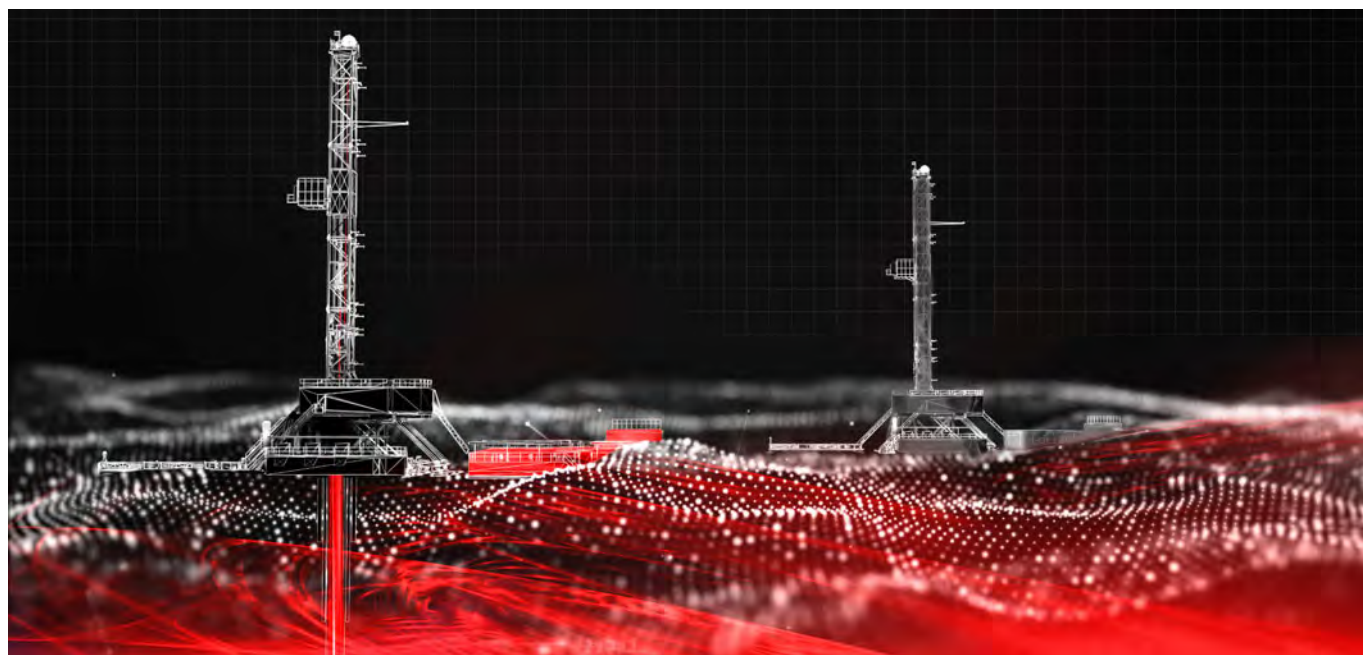




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On the cover: Oil Search's Stirrup exploration site within the company's lease area known as Horseshoe.

Photo by Judy Patrick, courtesy of Oil Search

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# Alaska spirit and 'great rocks' shine through COVID-19

By **CORRI A. FEIGE**

Commissioner, Alaska Department of Natural Resources

Alaska has long been a significant presence in North America's oil industry. Anchored by Prudhoe Bay, the continent's largest oil field, Alaska's North Slope producing region recently shipped its 17 billionth barrel of oil through the Trans-Alaska Pipeline System and is still going strong.

While in-fill drilling in the Central North Slope has continued to identify new pools of oil, exploration in the Brookian Sequence on state lands and adjacent National Petroleum Reserve-Alaska lands has been very successful. New discoveries have defined the North Slope's Brookian play, with the greatest excitement being generated by the Nanushuk Topset trend. With six new discoveries since 2015, the shallow, conventional and laterally extensive reservoirs that compose this formation have stirred a frenzy of exploration on Alaska's North Slope.

The Nanushuk formation is a shallow deposit comprised of topset structures deposited from west to east as vast amounts of sediment shed from Eastern Russia's Chukotka region and



**CORRI FEIGE**

filled the marine basin. Like other shelf edge deposits, the Nanushuk was deposited in long and thick, but narrow, bodies perpendicular to the direction of basin filling; in this case running along a roughly north-south axis over many, many miles.

Seismic work has revealed attributes and amplitudes that have helped identify which shelf edge sands contain hydrocarbons and have allowed some de-risking of potential exploration targets.


## Nanushuk discoveries started in 2015


Exciting discoveries in the Nanushuk formation started in 2015, when innovative explorers Armstrong Oil & Gas Inc. and Repsol E&P USA Inc. made their Pikka discovery east of the Colville Delta. ConocoPhillips followed with its Willow discovery in 2016, and in 2017 Armstrong and Repsol successfully drilled the Horseshoe No. 1, confirming that the Nanushuk topset trend extended roughly 40 miles from Pikka.

In 2018, ConocoPhillips discovered West Willow while following up on information from its Putu and Stony Hill wells to define their Narwhal trend. Armstrong sold its interests in Pikka to newcomer Oil Search (Alaska) LLC which followed up with

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its successful Mitquq and Stirrup wells this past winter. All told, currently identified resources in the Nanushuk play could amount to approximately 2.15 billion barrels of recoverable oil.

## 2019-20 exploration

Alaska's 2019-20 exploration season began with great promise, as the industry continued to target the Nanushuk. Oil Search (Alaska) drilled its Mitquq-1 and Stirrup-1 wells, reporting exciting results in the Nanushuk topset trend in each. The Mitquq well was logged and cored, recording 172 feet of oil and 29 feet of gas in the Nanushuk, and a stabilized flow rate of 1,730 barrels of oil per day from a single stimulated zone. Oil was also encountered in the deeper Alpine sand when Oil Search drilled its Stirrup well, reporting an oil column with net pay of 75 feet, with tests showing a stabilized flow rate of 3,250 barrels per day from a single stimulated zone.

ConocoPhillips targeted Nanushuk topsets by drilling its Tinmiaq-18 and Tinmiaq-20 wells at Willow, a project now in the late delineation phase, though they have released no public information. ConocoPhillips also targeted a new

*There are features basin-ward of the Nanushuk shelf edges in the oil-bearing Torok formation still awaiting evaluation. What's more, this play type extends eastward to the limits of state land on the central North Slope, and there are even more, younger topsets and basin floor features yet to explore.*

Nanushuk sand by drilling Harpoon-2, one of three bores planned for the formation. Again, no results were made public.

## COVID-19

By March, however, world events eclipsed the oil industry's demonstrated interest in the Nanushuk play and Alaska. The concerns over a global COVID-19 pandemic spread north, causing exploration to pause in favor of a deliberate program of minimizing the risk of exposure to workers. Alaska's state government and oil industry alike responded rapidly to protect the health of industry employees and the public, conserve valuable resources, and safeguard production

facilities and infrastructure.

Industry operators began by removing all non-essential personnel from North Slope operations and holding essential workers in place at their job sites, then implementing strict quarantine practices for rotating crews, establishing rigorous social distancing and sanitizing protocols, and taking other steps to maintain the integrity of their operations and facilities.

State government also responded quickly and comprehensively to ensure the safety of its employees and the public while continuing operations. The Department of Natural Resources quickly retooled its workforce to function both in-office and remotely, implemented its own rigorous social distancing and public health protocols, and moved all possible public-service functions online.

## Division of Oil and Gas

As oil prices plummeted in response to the contraction in global demand, DNR's Division of Oil and Gas granted several operator requests for extensions on annual lease rental payments and consulted with industry leaders to identify ways to accommodate the uncertainties

*continued on next page*

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**FEIGE** *continued from page 7*

brought by COVID-19 on a case-by-case basis. The division made it easier to submit well data by email or file-transfer-protocol websites, began offering updates on oil and gas leasing news via online subscription, and continued publishing decisions, news, and other important data online.

Throughout the pandemic event, DNR and other state agencies continued offering full services to the public and industry and maintained regular hours without interruption, while leveraging the opportunity to polish workplans to achieve the optimal balance between commercial considerations, and the challenges of operating in a changed environment.

In one particularly bold step forward, the division, with the assistance of global digital marketing firm EnergyNet, conducted its first-ever fully online areawide oil and gas lease sales, for the Alaska Peninsula and Cook Inlet sale on June 17. The division will build on this promising success by holding this fall's North Slope, North Slope Foothills and Beaufort Sea areawide sales online, as well.

## Outlook great

The outlook for oil in Alaska is great. Portions of the Nanushuk topset play are headed toward development. Other Nanushuk discoveries are in the delineation phase. Still other opportunities reside in the portfolios of operators with the proven ability to deliver. And with investment focus shifting away from shale back toward conventional oil development, the industry is again succumbing to Alaska's lasting allure.

A significant part of that attraction is knowledge that the Nanushuk topset play is just a portion of the Brookian sequence's potential. There are features basin-ward of the Nanushuk shelf edges in the oil-bearing Torok formation still awaiting evaluation. What's more, this play type extends eastward to the limits of state land on the central North Slope, and there are even more, younger topsets and basin floor features yet to explore. Armstrong, Oil Search, and Eni are among the proven explorers that have staked out sizeable holdings on the east side of the North Slope, and there is still more acreage available to lease.

It's also important to remember that

the Brookian, while hot, is not the only game in town. There is much more oil yet to be found in the proven, older portions of the section. This potential awaits savvy explorers — both those present in Alaska today, and those yet to arrive.

Despite the lingering challenges of dealing with COVID-19, Alaska oilfields remain stable, fruitful and ripe for much continued production. TAPS throughput has returned to near its forecast volumes of about 500,000 barrels a day. Exploration opportunities are varied and the capacity to deliver new oil to market remains available and ready. Alaska's land holds the promise of vast hydrocarbon accumulations yet to be discovered. Alaska's government, laws, fiscal systems, workforce and culture remain strongly supportive of the oil industry.

World oil markets, the oil industry and our communities will recover from the COVID-19 pandemic, adapt to new conditions, and emerge stronger and smarter. As they do, Alaska will be leading the way with one of the hottest shallow, onshore, conventional oil plays available anywhere in the world today. ●

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# What drives exploratory drilling?

*Examination of North Slope drilling history shows complex interrelationship with oil price, major discoveries and state tax changes*

By **ALAN BAILEY**  
For Petroleum News

The recent havoc in the oil market as a consequence of the COVID-19 pandemic, with the curtailed Alaska exploration drilling program last winter, has prompted interesting questions regarding the long-term impact of the oil price and oil market on exploration drilling on the North Slope. An analysis by Petroleum News of annual drilling levels, the market price of oil and other factors impacting the North Slope oil industry shows the complex interaction of a number of parameters.

Drilling data for this analysis came from the Alaska Oil and Gas Conservation Commission — the AOGCC has complete records of all wells drilled in the state. However, the commission does not distinguish between exploration wells and oil prospect appraisal wells, with both types being categorized as “exploratory.” The graphic accompanying this article shows the total number of exploratory wells drilled on the North Slope annually, since oil exploration started on the Slope in the 1960s. Excluded are gas wells and wells drilled by government agencies such as the U.S. Geological Survey. Since the AOGCC well data does not always include well spud dates, the dates used are the well completion dates — in most cases this corresponds to the year when the well drilling was initiated.

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*Factors influencing the amount of drilling included changes in Alaska oil production tax statutes, the availability of state tax credits for drilling activities, and encouragement from major oil finds.*

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## Major discoveries and oil prices

An immediate and obvious point of note is the correlation between some relatively high levels of drilling and major oil discoveries. In particular, the discovery of the giant Prudhoe Bay field in early 1968 was followed by a major peak in North Slope exploratory drilling. The Pikka oil discovery in the Nanushuk formation in 2005 also led to a flurry of exploration and appraisal drilling in subsequent years.

Layered on top of these features there appears to be some impact from oil price trends. The oil prices in the graphic come from the Energy Information Administration — they are the inflation-adjusted prices of oil imported into the United States and seem a reasonable proxy for the North Slope oil price. However, it is important to note that, while buoyant oil prices may encourage exploration activity, companies planning exploration must consider



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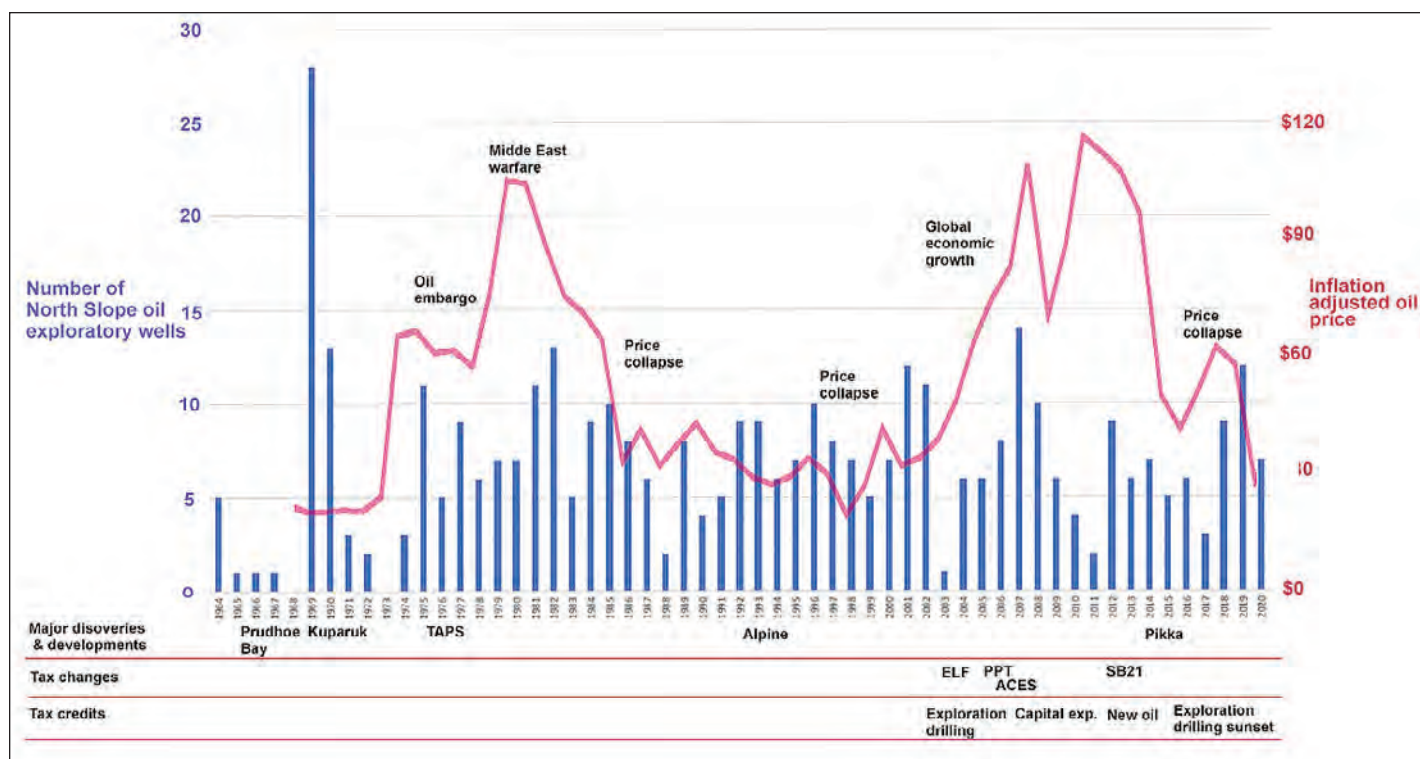
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oil price expectations several years into the future.

A statistical analysis of the oil price and drilling trends shows that there were periods when there was a correlation between the oil price and the number of wells drilled. However, there were also periods when the drilling rate completely disconnected from any oil price effect, as different factors came into play. Factors influencing the amount of drilling included changes in Alaska oil production tax statutes, the availability of state tax credits for drilling activities, and encouragement from major oil finds. Overall, periods of no oil price impact on drilling cancelled out the oil price correlation observed during other periods. The net effect was zero statistical correlation between the oil price and the number of wells drilled across the entire period since drilling started in the 1960s.

## 1970s market disruption

The Arab oil embargo of 1973 to 1974, followed by market disruption and an energy crisis triggered by the Iranian revolution and the Iran-Iraq war, caused oil prices to climb rapidly. This price climb and spike appear to correlate somewhat with a rise in North Slope drilling activity. The geopolitical events presumably also drove an interest in increased U.S. oil development.

The ending of the market disruption of the 1970s resulted in an oil glut and subsequent tumble in the oil price. The price peaked in 1980 and crashed by the mid-1980s. Alaska's economy saw a recession, as oil industry activity ground to a halt. And there was a corresponding sharp fall in the amount of exploratory drilling.

Statistically, the entire period from 1972 to 1988 saw quite a strong positive correlation between the annual number of wells drilled and the annual average oil price.

While the oil price remained relatively low for the next few years, it appears that the level of exploratory drilling on the North Slope recovered somewhat. Also, there were a number of appraisal wells drilled in this period, including wells associated with the major Alpine field, discovered in 1994. In the late 1990s there was a brief collapse in the price, as oil supplies exceeded demand. Although North Slope operators cut back on drilling, there appears

to have been only a brief dip in exploratory drilling.

The upshot of all of this was a small negative correlation between the annual well count and the average price of oil between 1988 and 1998.

## An oil price peak

Then, as the global economy grew, with the Chinese economy for example growing rapidly, oil demand started outstripping supply. The price of oil increased steadily, reaching a peak well over \$100 before collapsing back in 2014 through 2016. Initially, the pace of North Slope exploratory drilling increased, much in line with the increasing oil price — between 1998 and 2007 there was a modest positive correlation between the well count and the oil price. However, the drilling activity subsequently disconnected from the oil price trend, presumably at least in part because of major changes in the laws governing Alaska oil production taxes.

## Production tax changes

The oil production tax arrangements in Alaska remained unchanged from the early days of the North Slope industry until early 2005, when then Gov. Frank Murkowski increased the taxes by changing the rules for the “economic limit factor,” or ELF. This change impacted legacy oil fields in the Prudhoe Bay unit and appears to have had little effect on the amount of exploratory drilling.

In 2006 the state Legislature passed then Gov. Sarah Palin's production profits tax, or PPT, a major rewrite of the tax law, changing the basis of tax assessments from taxing the wellhead value of oil to taxing the profits on oil production. This was later modified into Alaska's Clear and Equitable Share, or ACES, a tax passed in 2007 that retained the profits based arrangements of PPT while increasing the base tax rate and the tax progressivity at high oil prices.

The oil industry slammed the new tax laws, arguing that a resulting huge tax increase would have a significant negative impact

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## EXPLORATORY DRILLING *continued from page 11*

on North Slope investment.

It is perhaps not coincidence that from 2008 to 2011 there was a continuous decline in the number of North Slope exploratory wells drilled, during a period of relatively robust oil prices.

In 2013 the Legislature passed Gov. Sean Parnell's Senate Bill 21, or SB 21, another major rewrite of the production tax statutes. SB 21 eliminated the progressivity of ACES while combining a flat tax rate with credits to encourage increased production. The industry has been supportive of SB 21.

There was a spike in North Slope drilling in 2012, the year prior to the passage of SB 21 — a peak in oil prices in 2011 and 2012 may have supported exploration enthusiasm.

### Pikka discovery

Over the next four years exploratory drilling continued at a level of around five wells per year. A number of these wells were drilled in response to the Pikka discovery.

In 2014 the oil price started collapsing, sinking to an average of around \$40 per barrel in 2016, as excess production flooded the market with oil. The oil market subsequently came into balance at prices around \$60 to \$70 per barrel. Until, that is, the COVID-19 pandemic arrived and, with it, the recent oil price disruption.

The winters of 2018 and 2019 saw particularly robust exploration drilling activity, with much focus on discoveries and prospects in the Nanushuk, in a business environment involving reasonable and seemingly stable oil prices.

However, across the entire period from 2007 to 2019 there was approximately zero statistical correlation between the number of wells drilled and the oil price — it appears that other factors such as new discoveries and the production tax situation were at play.

### State tax credits

Another factor impacting exploratory drilling in Alaska has been the availability of state tax credits. Tax credits have proven a key parameter in the encouragement of new drilling in the Cook Inlet basin and in Alaska's Interior basins. Credits have also encouraged exploratory drilling on the North Slope.

The first tax credit, a credit for exploration drilling, was introduced by Gov. Murkowski in 2003. That may have impacted the rise in exploratory drilling between then and 2007. The PPT legislation included a capital expenditure credit that could benefit exploration drilling, although this credit was discontinued on the North Slope by the SB 21 legislation. SB 21 replaced the capital expenditure credit with a new oil credit, to encourage the development of new oil.

Companies involved in the exploration that led to the Pikka discovery have indicated that tax credits significantly motivated their drilling projects. That drilling led to further exploration in the Nanushuk play discovered at Pikka. It is also likely that the credits introduced in 2003 encouraged Caelus Alaska's drilling in Smith Bay in 2016 — those credits sunsetted shortly after that drilling was completed.

On the other hand, Gov. Bill Walker's veto in 2015, deferring some tax credit payments, also had a negative impact on the amount of new drilling done, in part by undermining confidence in investments in Alaska exploration. ●

Contact Alan Bailey at [abailey@petroleumnews.com](mailto:abailey@petroleumnews.com)

Nordic Calista Rig 3 on the  
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PHOTO COURTESY 88 ENERGY

# Game changer: 88 NPR-A exploration plans

*Buys XCD, drilling wells in Harrier and Merlin Nanushuk prospects, analogous to Harpoon, Willow; portable rig, no ice roads*

By **KAY CASHMAN**  
Petroleum News

Australia independent 88 Energy Ltd., a Perth-based ASX and AIM listed firm (88E), is moving forward with plans to drill two exploration wells in the winter of 2020-21 in the National Petroleum Reserve-Alaska on acreage it acquired in an off-market takeover from XCD Energy. The program could prove to be a game changer for North Slope exploration in terms of saving time and money and thus making northern Alaska more affordable for small-to-mid-sized operators.

The wells, whose main target will be the prolific Nanushuk reservoir, will be drilled by one of 88 Energy's three operating subsidiaries, Accumulate Energy Alaska, which is run by long-time Alaska geologist Erik Opstad.

The Harrier and Merlin prospects where the wells will be drilled are in the 195,000-acre XCD Peregrine block. On Jan. 21,



**ERIK OPSTAD**

*continued on next page*

**NAME OF PARENT COMPANY:**

88 Energy Ltd.

**NAME OF ALASKA COMPANY:**

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Erik A. Opstad, general manager Alaska operations (oversees Accumulate, Captivate)

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2020, XCD managing director Dougal Ferguson told Petroleum News that Merlin is considered a direct analogy to ConocoPhillips' Willow oil discovery, while ConocoPhillips' Harpoon prospect "is interpreted to lie on the same sequence boundaries as the Harrier prospect."

Harrier and Merlin lie between the Umiat oil field to the south and Willow and Harpoon to the north.

## First of its kind

In a July 13, 2019, interview, Opstad told PN that the main target of the Harrier 1 and Merlin 1 wells, the Nanushuk, can be reached in less than 5,000 feet in the area, while a third prospect in the Peregrine block, Harrier Deep, has a Torok objective at about 10,000 feet. It will not be drilled in the 2020-21 winter season.

The shallower Nanushuk wells do not require the use of a rotary rig, or an ice road that is needed to transport the heavier traditional North Slope exploration rigs, allowing Accumulate to use a less expensive lightweight workover or coiled tubing rig that can be moved off-road in pieces by tundra-safe track vehicles on snow trails. Although the use of lightweight, portable rigs and snow roads has been studied and considered by XCD, Armstrong and Oil Search, 88 Energy will be the first to conduct such a program on the North Slope.

XCD has said the three onshore prospects hold a mean unrisks recoverable prospective resource of 1.6 billion barrels of oil, per an independent report generated by ERC Equipoise. (Harrier Deep was pegged at 572 million barrels.)

"We're starting the process for an oil spill plan for the federal acreage," Opstad said. Although the state has primacy with that type of permitting, the feds have some involvement.

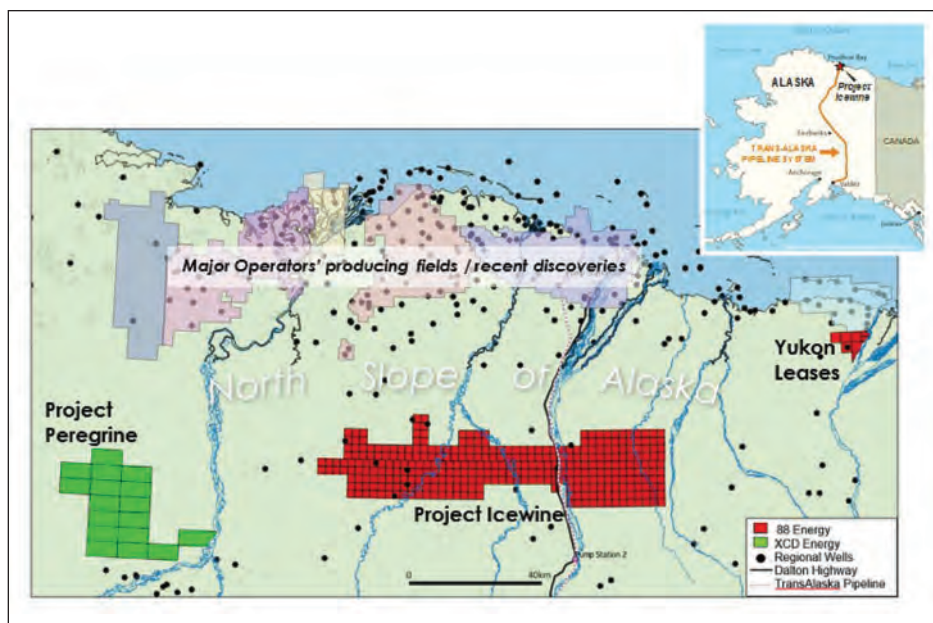
"The only hurdle," Opstad said, is that the federal process can be daunting, and "timing is very important to this project."

## History in Alaska

88 Energy has been operating on the North Slope since 2015 having originally entered the region via an agreement in 2014 with Burgundy Exploration.

Previously, 88 Energy had been named Tangiers Petroleum, with oil and gas assets offshore Morocco and on and offshore Australia.

In November 2014, Tangiers joined forces with Burgundy, the agent and high



*"The only hurdle," Opstad said, is that the federal process can be daunting, and "timing is very important to this project."*

bidder on almost 87,000 acres south of the Prudhoe Bay unit in the Division of Oil and Gas' North Slope areawide lease sale.

Tangiers became 88 Energy taking an 87.5% interest in, and operatorship of, the leases, which the partners named Project Icewine.

Today Icewine (see map in pdf and print versions of this article) is operated by subsidiary Accumulate.

In addition to Accumulate, 88 Energy has two other Alaska operating subsidiaries — Regenerate Alaska and Captivate Energy Alaska.

In the ensuing years 88 Energy expanded its exploration lease holdings to 492,000 gross, 300,000 net, acres in the central North Slope, plus the latest acquisition in July 2020 of XCD's 100% interest in the 195,000-acre Peregrine block in NPR-A.

The company via subsidiary Accumulate also operated four exploration/appraisal wells on the North Slope in conjunction with partners — Icewine No. 1 in 2015, Icewine No. 2 in 2017, the Winx 1 well in the winter of 2018-19 and Charlie 1 in the winter of 2019-20. None of the wells proved commercially successful, although according to 88 Energy the jury is still out on the Icewine unconventional targets in Icewine No. 2 and the condensate discovery in Charlie 1.

Today, 88 Energy's Alaska portfolio contains three key exploration project areas — Yukon Leases, Project Icewine and Project Peregrine. The company said in its July 21 second quarter 2020 quarterly activity report that it had relinquished its Western Block leases where it drilled the Winx well.

## Yukon Gold leases

In the 2017 and 2018 state areawide lease sales 88 Energy picked up eight leases on 15,234.71 contiguous acres on the eastern North Slope along the border of the ANWR 1002 area. Those leases contain a historic BP oil discovery, Yukon Gold.

The 100% owned Yukon leases are operated by subsidiary Regenerate, which is run directly by David Wall, managing director of 88 Energy.

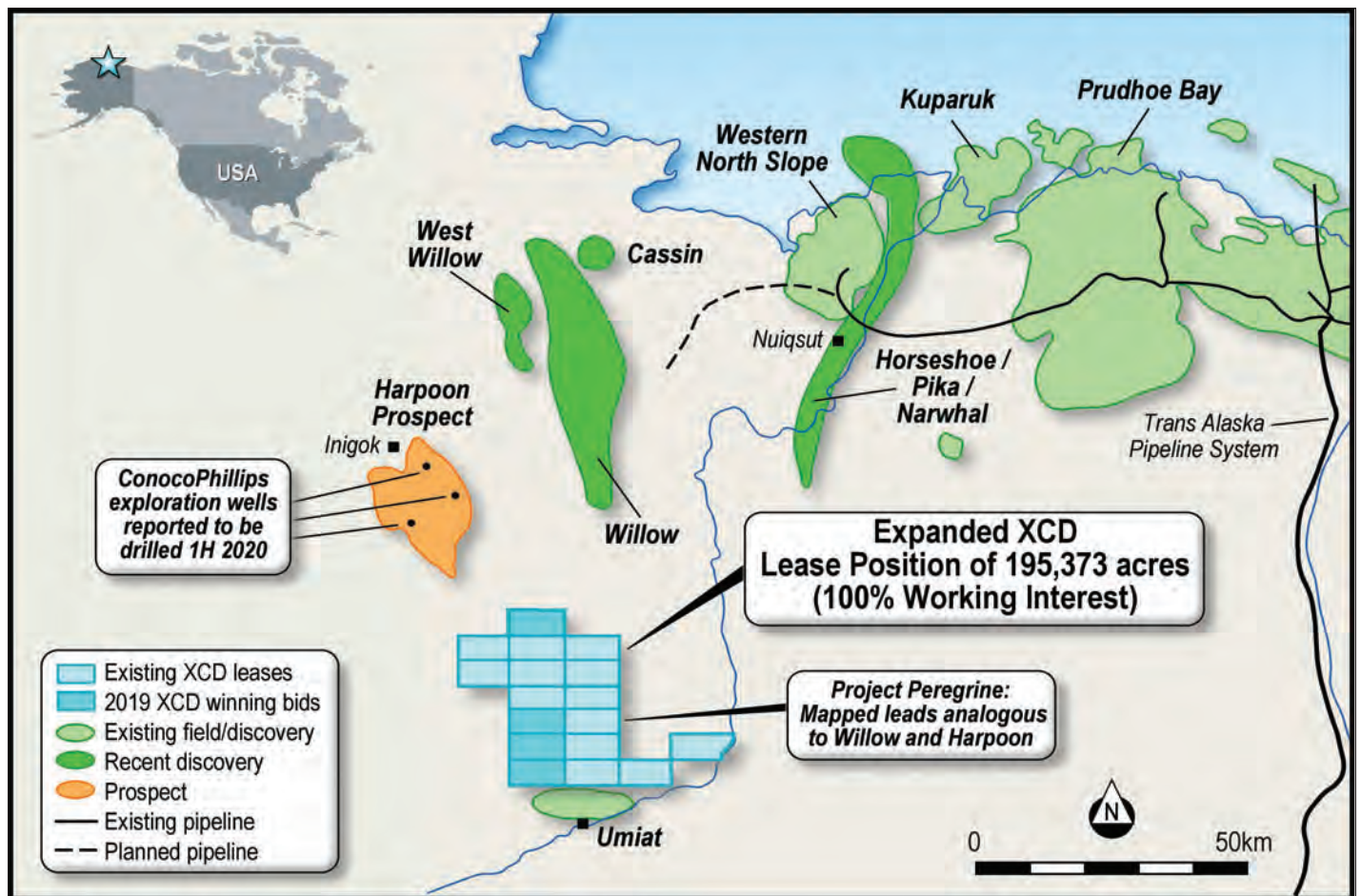
In its second quarter 2020 quarterly activity report, 88 Energy said, "discussions continue with nearby resource owners to optimize the monetization strategy of the acreage, with permitting continuing for future potential exploration drilling — subject to farm-out."

Unlike the 2019 fourth quarter activity report released in January 2020, the July report does not specify that the permitting was being done for a new well in 2021, likely because of the change in oil prices and market conditions since then, making the timing of the well uncertain.

## Activity close to Yukon Gold

A few miles north and a little east of Yukon Gold and the eight 88 Energy

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leases, Jade Energy owns and operates the untapped Sourdough prospect and is planning to drill a new Sourdough oil well in the winter of 2021-22, under an agreement with Point Thomson operator ExxonMobil.

The well, on state lease ADL 343112 in area E Tract 32, of the Point Thomson unit will be drilled to approximately 12,750 feet to encounter a prospective Brookian sand target and Hue shale.

As part of the 2012 settlement between the state of Alaska and the working interest owners of the ExxonMobil Point Thomson unit, an East Pad was to be built, an East Pad well drilled and an additional well drilled in the unit.

The state has since agreed that the requirement will be fulfilled through independent Jade Energy's plans for Sourdough, which will utilize some existing Point Thomson infrastructure for its operations.

ADL 343112 holds two mid-1990's Sourdough oil discovery wells that were drilled by BP, which estimated Sourdough held 100 million barrels of recoverable oil.

ExxonMobil and the other major working interest owner at the time, BP Exploration Alaska, and minority owner ConocoPhillips Alaska all assigned their full working interests in Tract 32 of the lease to Jade, each retaining a small overriding royalty. The deal gave all three North Slope producers some skin in the game, fully aligning them in delivering a successful Sourdough development.

By building a 70,000 barrel per day liquids export pipeline at Point Thomson that connects to the Badami unit and thus moves oil and condensate to Pump Station 1 of the 800-mile trans Alaska oil pipeline, ExxonMobil improved the develop-

ment economics of other oil prospects to the east, such as Sourdough, and Yukon Gold.

Jade's owners are Anchorage-based Opstad and Castle Rock, Colorado-based Greg Vigil, who each own 50% of the firm, with Opstad in charge of operations.

### Project Icewine, conventional

In 2019, 88 Energy signed a sale and purchase agreement with London-based Premier Oil Plc under which Premier farmed-in for a 60% interest in Area A of the conventional Project Icewine acreage, with 88 Energy retaining a 30% working interest in Area A and the remaining 10% working interest held by Burgundy.

Under the terms of the agreement, Premier paid the full costs of the appraisal well, Charlie 1, up to a total of \$23 million to test the reservoir deliverability of the nearby 1991 Malguk 1 BP oil discovery.

The well came in under budget, but the results were not commercial, and the well was plugged and abandoned in April 2020, although 88 Energy continues to study the results.

While Premier has withdrawn from the joint venture, it is continuing to pay costs in relation to the drilling operations and post well testing and site cleanup, 88 Energy said in its July 21, 2020, report.

On May 4, 2020, the Alaska Department of Natural Resources' Division of Oil and Gas extended the time for Accumulate to make payments on annual oil and gas lease rentals due to the state in 2020. For oil and gas lease rentals due in June, July and September of 2020, a six-month extension was given to make rental payments due in these periods. For oil and gas lease rentals due in October and November of 2020, a three-month extension was given.

### Project Icewine, unconventional

Unconventional detailed logs and sidewall cores were also acquired in the HRZ formation in Project Icewine. They will continue to be analyzed in 2020.

The HRZ "remains a viable target and options to commercialize this potentially large resource continue to be pursued," 88 Energy said in its second quarter 2020 activity report.

The company plans to conduct a formal farm-out process to fund further appraisal. ●

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# Borealis working on 2021-22 exploration plans

*Drilling Castle North first west of the central North Slope in NPR-A; seeking JV partner; first taker was Armstrong for 72% WI in Castle West prospect*

By **KAY CASHMAN**  
Petroleum News

**B**orealis Alaska Oil Inc. is continuing to progress plans for exploratory drilling at its Castle North prospect in the northeastern National Petroleum Reserve-Alaska. Richard “Dick” Garrard, Borealis chief technical officer, told Petroleum News in early July 2020. The company plans to drill in the winter of 2021-22, he said.

A June 2019 re-brand of Nordaq Energy, Borealis has been focusing its exploration interests on two areas of the North Slope — the northeastern NPR-A and the more easterly part of the Slope, to the south of the Badami oil field.

The Anchorage-based independent is also evaluating the reprocessing of some 2D seismic associated with its Grey Owl prospect trend on state land near the Arctic National Wildlife Refuge 1002 area, Garrard said. The ANWR 1002 area is 1.57 million acres in a narrow strip of coastline that was set aside because of its petroleum potential by Congress in 1980 when the 19 million-acre refuge was created.

Borealis continues to seek joint venture partners for its drilling. At the end of 2019 the company completed a joint venture deal with Armstrong Oil and Gas, in which Armstrong obtained a 72% working interest in eight leases covering the Castle West prospect area in NPR-A.



DAVID PFEIFFER

## Castle prospect trend

In NPR-A, the Borealis leases lie in what the company terms the Castle prospect trend, a series of six individual prospects in the lower Nanushuk formation. Southwest of Willow, the prospects are directly analogous to the geologic setting for major oil discoveries at Pikka, under development by Oil Search (Alaska), and by ConocoPhillips at Willow, Garrard said.

The Castle East prospect lies in the same sand body as the Harpoon prospect, where ConocoPhillips drilled an exploration well in the winter of 2019-20.

According to Garrard, Nordaq recognized the potential of the Castle trend and obtained leases in the area three years before ConocoPhillips announced its big Willow discovery.

## Focus on Castle North

Borealis is particularly focusing its attention on drilling in the Castle North prospect, where it has identified four drilling sites. A nearby large gravel pad and 6,500-foot runway developed for the drilling of the Inigok well in 1978-79 can be used as an operations base for drilling and seismic activities, thus reducing the cost of the drilling project. Access would be by a winter snow

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COMPANY WEBSITE: <https://borealisalaskaoil.com/>



trail from the Kuparuk 2-P Pad.

In a 2019 interview Garrard said the drilling of the Inigok No. 1 well in the Castle trend area by the U.S. Geological Survey and Husky Oil points to a strong possibility of finding oil in the trend.

The USGS/Husky well was drilled very deep, to around 20,000 feet, to test for oil in the Ellesmerian sequence, the rock sequence that hosts the main oil reservoir for the Prudhoe Bay field. But the upper part of this well, down to a depth of about 4,000 feet, encountered sands with gas shows, Garrard said.

These gas shows had heavy to light gas ratios indicative of the presence of light oil in the Brookian rocks of the region.

The oil that ConocoPhillips found at Willow was light, with an API gravity of 40 to 44 API, he said.

Agile Seismic in Houston completed the reprocessing of 3D seismic data for Castle North, per Garrard. The focus of the reprocessing was the shallow rock interval down to the base of the Nanushuk. The reprocessed seismic was used in a Castle North shallow hazards assessment, conducted for Borealis by Fugro. The seismic and the associated assessment revealed a possible hydrocarbon related amplitude anomaly at a shallower depth than the planned exploration target at one of the drill sites.

Currently, Garrard said on July 22, 2020, Borealis is conducting a detailed analysis of the 3D seismic amplitudes (AVO/AVA) associated with the Castle North prospect through Agile Seismic, the results of which will become available very soon. Studies of this

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*In NPR-A, the Borealis leases lie in what the company terms the Castle prospect trend, a series of six individual prospects in the lower Nanushuk formation.*

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*continued on page 19*



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type can help in reservoir prediction including thickness, quality and fluid saturations, he said.

## BLM maintains Inigok

The Bureau of Land Management has maintained the facilities as the Inigok Operations Center, and companies exploring in the area can use the center as an operations base, thus eliminating the need to construct an ice pad or ice runway.

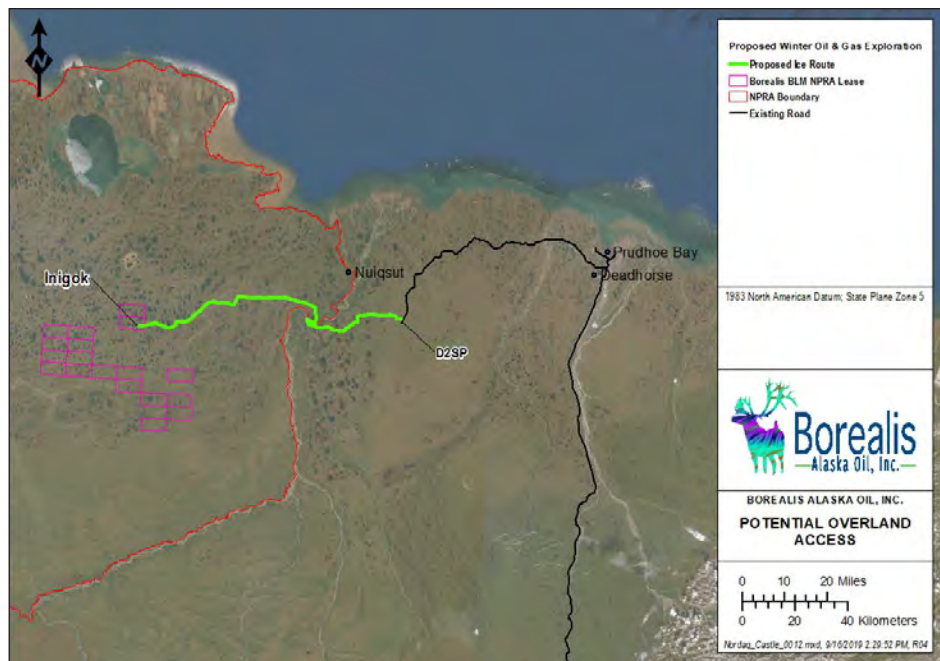
"It really does help, because there's not a lot of infrastructure as you go west," Garrard said. "That can make drilling operations and seismic operations much cheaper."

Equipment would be transported to the Inigok Operations Center by snow road from the central North Slope, he said.

Once the equipment is at Inigok, it should be possible to drill several wells relatively quickly since testing the Brookian prospects only requires drilling to depths of no more than 4,000 feet — a single well will perhaps take around a week to drill, Garrard said.

## Planning, permitting started

Because of logistical issues associated

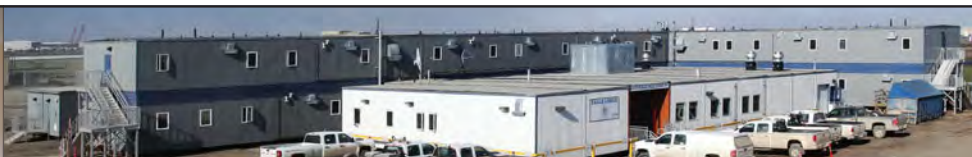
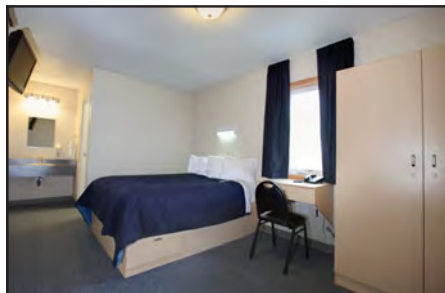


The Castle North prospect in the National Petroleum Reserve-Alaska is adjacent the Inigok airfield and gravel pad. Access would be by winter snow trail from the Kuparuk 2-P Pad.

with the COVID-19 pandemic, Borealis had to defer summer 2020 field studies of the drill sites until 2021. Meanwhile, the company has commissioned Owl Ridge Natural Resource Consultants in Anchorage to start the long lead permitting and

planning, to meet a target 2021-22 drilling schedule, Garrard said. Because of the pandemic, BLM has agreed to temporarily suspend the primary term of NPR-A leases 100% held by Borealis, he said.

*continued on next page*



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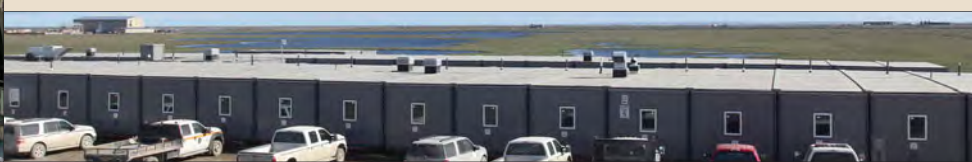
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The company intends to drill one exploration well, with the possibility of a second appraisal well, depending on drilling results. If time is available, it may be possible to drill a third well, Garrard said.

Borealis thinks BLM's preferred alternative for its new NPR-A integrated activity plan is encouraging and bodes well for the future of NPR-A oil exploration and production.

### Grey Owl trend

The Grey Owl trend, near the ANWR 1002 area border also involves prospects in the Brookian rock sequence, the sequence that contains the Nanushuk formation. However, the Grey Owl prospects are in the Canning formation, a rock formation that consists of layered sandstones referred to as turbidites.

Unlike the Nanushuk, which was formed on the upper edge of an ancient marine basin, the Canning turbidites were deposited on the basin floor. While the location of the turbidites in the axial region of the basin bodes well for reservoir quality, findings from the West Kavik Unit No. 1 well, drilled by Texaco in 1969, indicate the presence of over-pressured light oil in the Canning at Grey Owl, Garrard said.

The area is just 25 miles south of existing oil infrastructure at Badami.

In July 2020, WesternGeco was reprocessing some 2D seismic for the Grey Owl area on a trial basis to evaluate the possibility of better imaging the Canning reservoirs. If this trial



**DICK GARRARD**

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*Garrard believes the presence of Borealis in Alaska represents a trend towards activity by smaller oil companies, typical of what is seen in many petroleum basins around the world.*

---

proves successful, Borealis may consider the complete reprocessing of all the licensed 2D seismic for the area, Garrard said.

### Smith Bay divested

Nordaq had interests in offshore leases in Smith Bay, west of the central North Slope, where Caelus Energy Alaska said it made a major oil find in 2016. However, Borealis divested its interest in the Smith Bay assets, having determined that the logistical costs of operating in that area were too high for a relatively small company, Garrard said in the 2019 interview.

Also, although in the past Nordaq conducted exploration activities in the Cook Inlet region, Borealis is now focusing on the North Slope rather than the Cook Inlet, he said.

Garrard believes the presence of Borealis in Alaska represents a trend towards activity by smaller oil companies, typical of what is seen in many petroleum basins around the world.


"New companies with new ideas and more activity are needed to stimulate fresh exploration and hopefully new discoveries," he said. ●

*—Alan Bailey contributed to this article.*

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# Tax uncertainty in Alaska puts investment at risk

*Big explorer and developer ConocoPhillips Alaska waits on Nov. 3 tax initiative ballot outcome to determine 2021 capital budget*

By **KAY CASHMAN**  
Petroleum News

The North Slope's most active explorer, ConocoPhillips Alaska, is holding off on re-starting its exploration program in the upcoming winter of 2020-21 until the outcome of the tax initiative ballot in the Nov. 3 election is known.

Scott Jepsen, the company's vice president of external affairs and transportation, said May 8, 2020, that getting North Slope jobs and production back to a normal level of activity is partly dependent on the state's investment climate, "and by that, I mean on whether or not the oil tax initiative passes." The initiative calls for "a significant tax increase" which "will put a brake on future investment," he said, echoing the conviction of several other oil and gas companies in Alaska.

John Roper, director of media relations and crisis communi-



**RYAN LANCE**

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COMPANY HEADQUARTERS:

Houston, Texas

TOP ALASKA EXECUTIVE: Ryan Lance

ALASKA SUBSIDIARY: ConocoPhillips Alaska

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**ConocoPhillips**

cations for ConocoPhillips out of Houston, said "the capital reductions we announced in March and April assumed we don't resume drilling activity at our North Slope operations for the remainder of 2020. We haven't yet set our capital plans for 2021."


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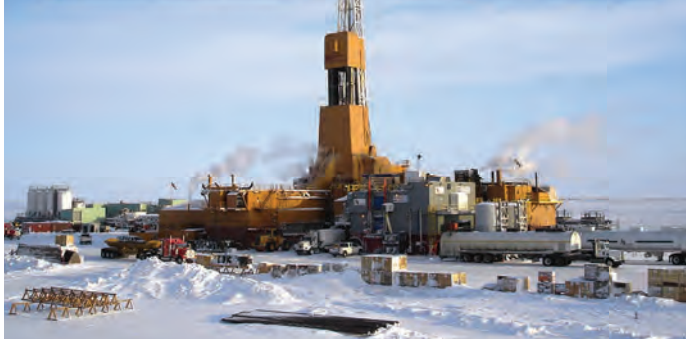
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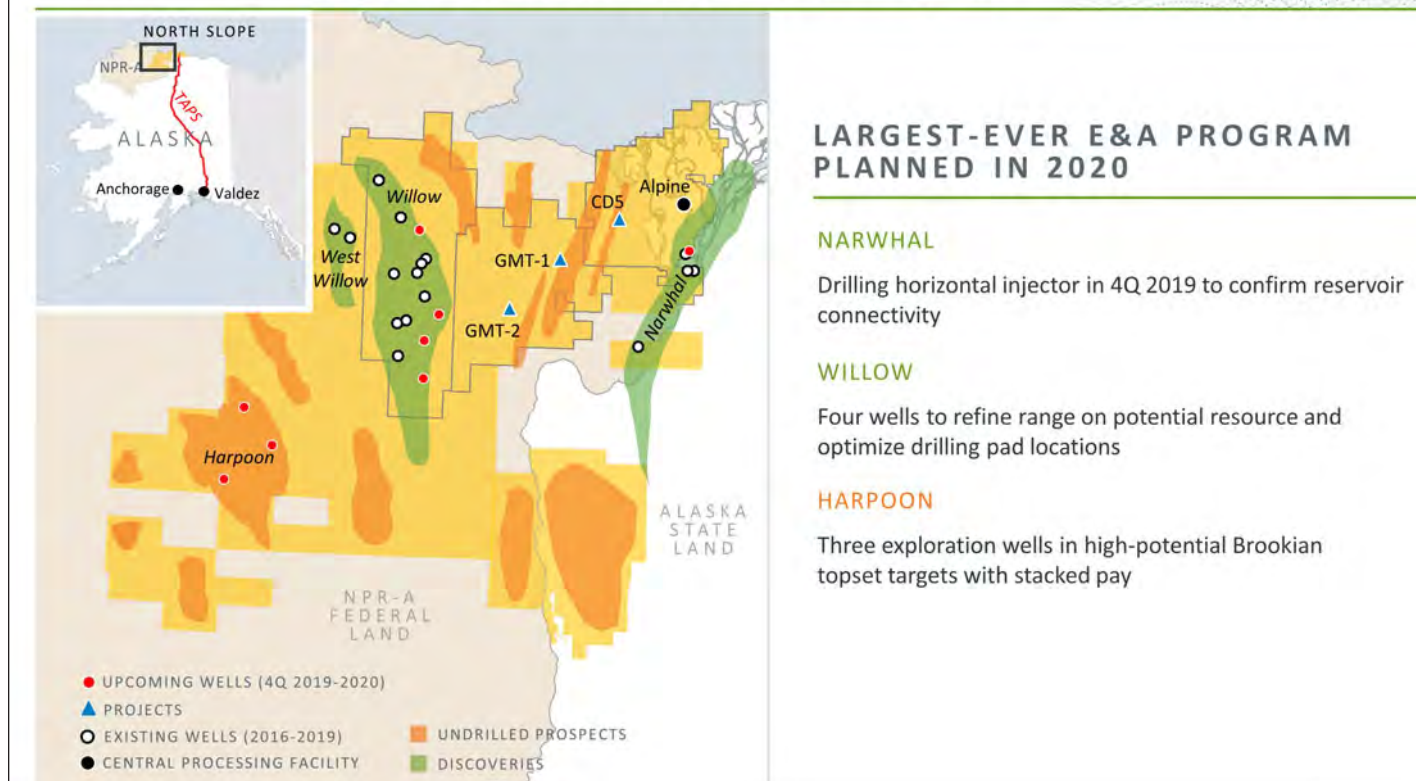





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# Alaska – 2020 Exploration and Appraisal Program



**CONOCO** continued from page 21

Those plans “will depend on our outlook for prices and, specifically in Alaska, the outcome of the tax initiative,” Roper said.

In the previous winter of 2019-20, ConocoPhillips drilled three of its planned six to seven exploration wells before it cut the season short because of concerns for worker safety connected to the coronavirus.

## High cost area

In a June 4, 2020, CERA Week interview/discussion between Daniel Yergin, vice chairman of IHS Markit, and Ryan Lance, ConocoPhillips chairman and CEO, Yergin asked about the new oil potential in Alaska.

Lance talked about the company’s big North Slope Narwhal and Willow oil discoveries, which are primarily in the Nanushuk formation.

Those “new petroleum systems” offer Alaska the opportunity to “stabilize production going through TAPS,” the trans-Alaska pipeline system, Lance said. “We see a lot of opportunity in Alaska,” he told Yergin, noting ConocoPhillips “took some of our partners out” and now “own a 100% position.”

But if the new tax initiative passes, it increases the “above-ground risk.” The North Slope is already a “high cost area,” Lance said.

And although ConocoPhillips has operated in Alaska for “a long time ... if the tax rate goes up, cash flows go down and we

have to manage in a rational environment,” Lance said.

## 2019-20 exploration

The results from the three wells ConocoPhillips drilled in early 2020 — two Tinmiaq wells near the big Willow discovery and a rank exploration well in the Harpoon prospect — appear promising.

According to Matt Fox, ConocoPhillips executive vice president and COO, Tinmiaq results were what was “expected,” and Willow development is on track. (Willow is anticipated to have a peak production of 130,000 barrels of oil per day over a 30-year life.)

“We’re working through Willow, and we’re in the concept selection stage just now. We have a timeline that would get us to the end of this year with the opportunity to select the concept. And by that, I mean, how big a facility do we build, how many drill centers do we have and so on,” Fox said on April 30, 2020, in a first quarter earnings conference call, noting no decision has been made to defer Willow. (On July 30, 2020, days after *The Explorers* magazine goes to press, ConocoPhillips has scheduled its second-quarter earnings conference call, so check Petroleum News for updates.)

In the Harpoon well they “clipped the edge of the topset based on its log response. ... We won’t know that for sure until we get a chance to drill the second well,” Fox said, a reminder that ConocoPhillips executive Michael Hatfield said in November 2019 that 3D seismic imaging indicates Harpoon has “high-potential Brookian topset targets with stacked plays.” Hatfield is president of Alaska, Canada and Europe for the company.

When asked about encountering hydrocarbon fluids in the Harpoon well, Fox said: “Yes, we did encounter hydrocarbons. ... it looks from a lithological perspective similar to other litho-



**MICHAEL HATFIELD**



**MATT FOX**

logical signatures we're seeing on the edge of these topsets."

### 'Beast' a game-changer

In March 2020 a new ultra-extended reach drilling rig, built by Doyon Drilling for ConocoPhillips, was delivered to the CD2 pad in ConocoPhillips Colville River unit northwest of the main Alpine field to assist with development of the unit's Fiord West prospect on the environmentally sensitive Beaufort Sea coast.

Doyon 26, also known as the "Beast," can reach reservoirs some 7 miles from its surface location. This means the high-tech ERD rig will be able to reach 154 square miles of reservoir versus the standard 55 square miles accessed by other North Slope rigs.

Fox described it as the "largest mobile extended reach drilling rig in North America and maybe the biggest in the world." Doyon 26 is yet another example of ConocoPhillips massive investment in Alaska.

The 9.5 million-pound ERD rig — weight equivalent to almost 10 fully loaded Boeing 747s — has four 2,200 horsepower mud pumps.

Doyon 26 can burn a mix of processed field gas and diesel, displacing about 50%

## Conoco: Tax Initiative – A Serious Threat to Future Investment

- Initiative makes key changes to SB21
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of the diesel required to operate the rig, which will be a big savings for ConocoPhillips, both in terms of cost and emissions.

Other drilling rigs do not have the capability to access Fiord West without a new gravel pad, additional pipelines and more road being built — hence increasing the development footprint.

ConocoPhillips Alaska has been working on the rig from initial FEED, or front end engineering design, studies and concept stage for about four years, recognizing what a game-changer the rig will be

for it in Alaska.

The company anticipated Doyon 26 spudding its first well near the end of April 2020.

But that all changed with ConocoPhillips April 8, 2020, statement to Petroleum News, saying it was demobilizing its North Slope rig fleet due to the coronavirus pandemic.

### Top of the ladder

On April 16, 2020, in ConocoPhillips'

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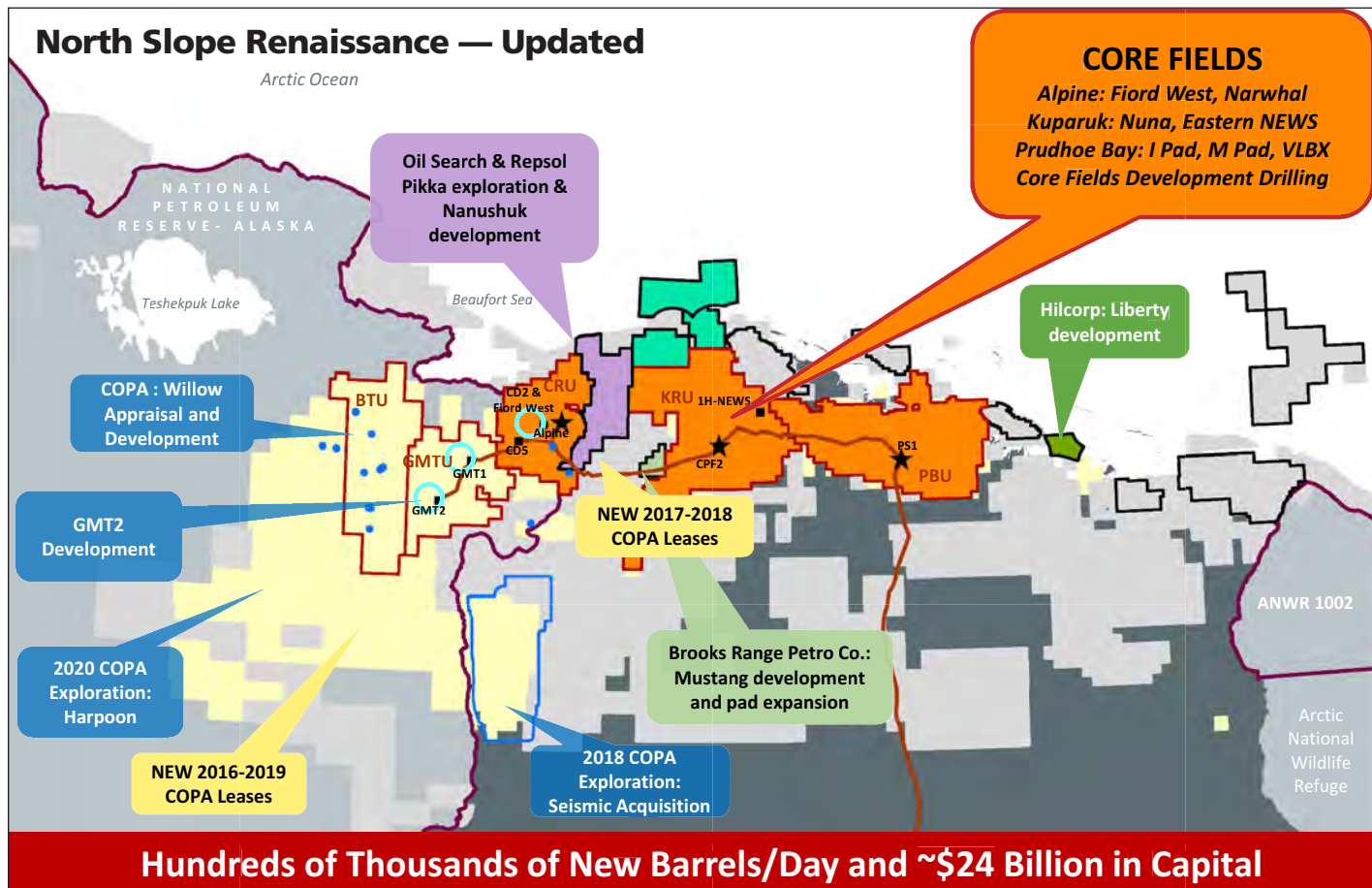
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**CONOCO** continued from page 23

second round of spending cuts since oil prices plunged and the coronavirus struck, Alaska once again lucked out with only \$200 million of the company-wide \$1.6 billion capex reduction coming from the state. Alaska spending for 2020 was reduced March 18, 2020, from approximately \$3.4 billion to \$3.2 billion; the April 16 announcement brings it down to about \$3 billion.

Before disaster struck on April 20, 2020, and crude fell into negative territory for the first time in history as the COVID-19 pandemic decimated oil demand, Alaska was slated to receive about half of ConocoPhillips world-wide exploration capital.

In fact, the company remained on track to invest \$25 billion of capital over the next 10 years in Alaska, Hatfield said in a fourth quarter conference call Feb. 4, 2020.

"In short, we've got a big program that we're executing across our assets in Alaska, including at the non-op asset in Prudhoe Bay," he said.

"These investments will increase the state's production and mitigate the cur-

continued on page 26



Doyon 26. A giant ERD rig also known as the "Beast," was transported in pieces to CD2 pad.

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rent decline through TAPS.”

ConocoPhillips spending plans for Alaska are not surprising given its recent discovery of approximately 1 billion barrels of light, sweet oil west of the central North Slope and into the National Petroleum Reserve-Alaska. After all, the company has said 75% of its prospective exploration acreage in the state has yet to be drilled.

But if there is a negative change in Alaska’s fiscal regime, ConocoPhillips’ investment plans will change. Still, the company is hopeful that the ballot initiative to increase oil and gas taxes will be rejected.

“We’ve been in Alaska for over 40 years; we know Alaskans understand the industry; it’s the lifeblood of the state’s economy,” Hatfield said. “We believe Alaskans will understand that short-term revenue gain is a risky and fleeting proposition if it comes at the cost of billions of dollars of investment over the coming years.”

### Sell-down on hold

At the end of 2019, ConocoPhillips was looking for a North Slope exploration and development farm-in partner to take a 15-25% interest in some of its prospects.

But the sell-down is on hold.



JOE MARUSHACK



SCOTT JEPSEN

*“We’ve been in Alaska for over 40 years; we know Alaskans understand the industry; it’s the lifeblood of the state’s economy,” Hatfield said. “We believe Alaskans will understand that short-term revenue gain is a risky and fleeting proposition if it comes at the cost of billions of dollars of investment over the coming years.”*

“At this point, we only plan to sell down after the uncertainty related to the citizens’ initiative has been resolved, and after we’ve fully interpreted the results of our exploration and appraisal program, and when we’ve progressed ... Willow through the concept select gate,” Don Wallete, executive vice president and CFO, said Feb. 4, 2020. “After we’ve satisfied those three criteria, that’s when we plan to execute this sell-down, so that pushes the sell-down most likely well into next year.”


He said the company would not execute a sell-down in a way that causes it to lose control of the investment pace.

“We’re already confident that there’s multiple quality parties that are interested in these great assets,” he said.

“We would be open to an equal-value strategic transaction or a swap rather than cash, if that makes sense,” Wallete said.

“We’re going to resolve some of these uncertainties, and then we’ll approach the market.” ●

Contact Kay Cashman  
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# Eni trying again at Nikaitchuq North in 2022

*Second wildcat well postponed for two years; plans for Eni's undeveloped acreage on eastern North Slope remain confidential*

By KAY CASHMAN  
Petroleum News

Eni US Operating Co. Inc., a subsidiary of Italian multinational Eni S.p.A., will likely spud its second Nikaitchuq North extended reach exploration well in second quarter 2022. The Alaska Beaufort Sea prospect is in a 13-lease federal OCS unit, Harrison Bay block 6423, which is approximately 6 miles from the Spy Island Drill site in the state Nikaitchuq unit (see map in pdf version of this story).

In Eni's 13th plan of development for the Nikaitchuq unit the major told Alaska's Division of Oil and Gas that it will do facility upgrades to support the NN-02 well, including a new six-slot well containment shelter and associated well conductors. The work will be done during the 13th POD period from Oct. 1, 2020, through Sept. 30, 2021.

The original plan for NN-01, the first Nikaitchuq North wildcat, envisaged the potential drilling of a sidetrack well following completion of the main well. Eni no longer plans to finish drilling NN-01 or sidetrack it; rather it will try again with a new well.

Similar to the first ultra-extended reach well, NN-02 will be an S-shape wellbore into the target reservoir and drilled from Spy Island Drill site, or SID, which is a man-made gravel island in shallow state waters off Oliktok Point where Nikaitchuq's onshore production and processing facilities are located.

With NN-02 Eni is again striving to break all Alaska records for extended reach drilling to reach a measured depth of 34,000-35,000 feet.

## Short of its target

The NN-01 well was first spud at SID on Dec. 25, 2017, but drilling did not get underway until February 2018 because of what Eni said were "unforeseen impacts to the drilling schedule."

The well was drilled to a measured depth of 30,010 feet and suspended in August 2018, but not fully logged as it was short of its target which seismic showed to be at approximately 34,150 feet. NN-01 drilling was done with Doyon Rig 15, which had been specially modified for the well.

Drilling operations resumed in mid-January 2019, but due to the "drilling complications" at NN-01 that had plagued it from the start, Eni said it suspended the well in April of that year.

## Two-year drilling delay

In its 13th POD Eni said it planned to resume drilling opera-



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tions by spudding a new well, NN-02, in second quarter 2020, aiming to reach target depth by third quarter 2020. The U.S. Bureau of Ocean Energy Management said Eni's NN-02 well would be "targeting the same seismic anomaly" as the first well.

However, Shell, Eni's working interest partner in the federal leases where the downhole target is located, "elected to go non-consent in the drilling of NN-02 well therefore causing Eni to temporarily postpone drilling plans," Eni told the agency.

As a result of its partner's decision not to participate in NN-02, Eni applied for and received from the U.S. Bureau of Safety and Environmental Enforcement a suspension of operations for "an additional 2-year period, or until April 2022."

## Geological target speculation

The seismic anomaly from 3-D over Nikaitchuq North was not identified by Eni in the public portion of the plans it filed with the division or with BOEM, but it left hints elsewhere; specifically in the Oil Discharge Prevention and Contingency Plan application that appeared to be based on tapping the Jurassic Alpine sands, which would certainly qualify as an anomaly in the area.

Whatever the case, the 25,957 barrels per day in the contingency plan application could not be referring to the heavy Schrader Bluff oil produced from the Nikaitchuq unit that is known to extend a long way north because that oil can't flow unassisted.

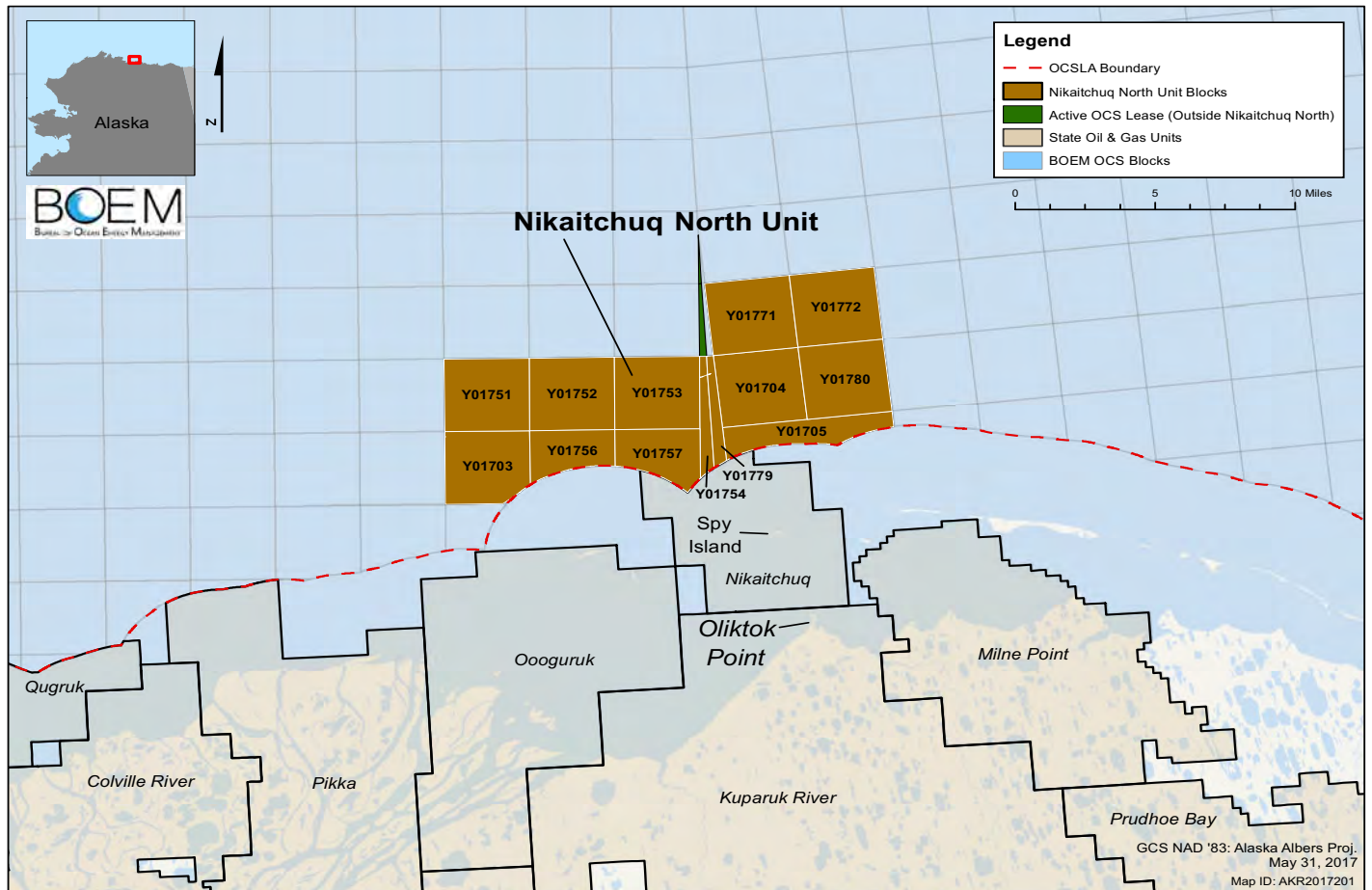
Also, the measured depth and angle of the well suggest one of the Jurassic sands.

A previous Nikaitchuq unit operator, Kerr-McGee and partner Armstrong, talked about the possibility of testing the Jurassic Nuiqsut sandstone and the Triassic Sag River sandstone to the north.

## Spare processing capacity

One of the reasons Eni gave for stepping out north of the Nikaitchuq unit to test the Nikaitchuq North prospect was it

*continued on page 29*



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wanted new oil to take advantage of significant spare capacity in the standalone Nikaitchuq unit production facility, which can currently handle 40,000 barrels per day and can easily be expanded to 50,000 bpd, according to Eni Alaska Vice President Whitney Grande.

Production from Nikaitchuq averaged 18,144 bpd in May 2020.

## Exploring farther east

While Eni's Nikaitchuq and Oooguruk developments are west of the BP-operated Prudhoe Bay unit, the 350,000 undeveloped acres Eni purchased from Caelus in August 2018 are on the eastern North Slope between Prudhoe and ExxonMobil's Point Thomson unit. The acquisition was in line with Eni CEO Claudio Descalzi's May 2018 declaration at a 2018-21 strategy meeting that Eni was doing well in Alaska and had plans for increased investment in the state.

At the time of the purchase, Eni said it planned to "apply its business model and experience," involving "fast-track exploration" and "a short time to market" for the "potential new discoveries."

Containing 124 state leases in two blocks, the acreage is relatively unexplored and close to existing infrastructure and to the trans-Alaska oil pipeline. It is approximately 20 miles southeast of Deadhorse, which is an unincorporated community consisting mainly of facilities for oilfield workers and firms that have contracts with the nearby oil fields, including Prudhoe. Deadhorse is accessible via the Dalton Highway and the Deadhorse Airport.

## Multiple play types

Shortly after acquiring the eastern North Slope leases in 2015, Caelus acquired 175 square miles of new 3-D seismic data and reprocessed another 275 square miles of existing 3-D to image prospects in the acreage.

"Adjacent infrastructure with available capacity reduces threshold volumes required for developing discoveries in the sub-100 MMBO recoverable range," Caelus said. "Multiple play types within proven stratigraphic horizons provide significant upside potential in previously poorly imaged structural trends and/or subtle stratigraphic traps."

Surrounding legacy wells "confirm deeper petroleum system elements and de-risked shallower Brookian reservoirs and hydrocarbon charge and phase within the area," Caelus said, much of which was mostly ignored in drilling until Armstrong and

*In Eni's 13th plan of development for the Nikaitchuq unit the major told Alaska's Division of Oil and Gas that it will do facility upgrades to support the NN-02 well, including a new six-slot well containment shelter and associated well conductors.*

Repsol discovered big oil finds in the shallow Brookian Nanushuk at Pikka and Horseshoe west of the central North Slope.

Armstrong and Oil Search also have a huge block of undeveloped acreage near Eni's 350,000 acres. ●

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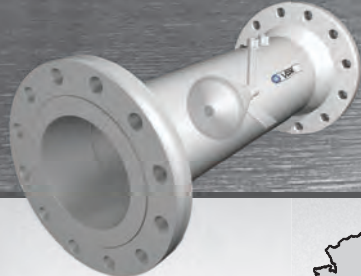
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# Exploration is not Hilcorp's forte, but ...

*Known for squeezing oil & gas out of mature fields, Hilcorp appears to be advancing Whiskey Gulch, Lower Cook Inlet exploration*

By **KAY CASHMAN**  
Petroleum News

**H**ilcorp is best known for employing modern tools to increase output from mature oil and gas fields, giving fields past their prime the attention they need to continue producing at optimum levels.

Hilcorp's modern exploration toolbox is seldom pulled off the shelf but with the company's strategy of having little middle management, its individual asset teams have creative license to chase ideas, an approach that paid off in late 2018 with a natural gas discovery in the Seaview No. 8 discovery well in the southern Kenai Peninsula.

Near Anchor Point, Seaview is slated to go online in late 2020.

Among other things, Hilcorp's exploration tool chest includes airborne gravity gradiometric and magnetic surveys,



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along with geologic field surveys, drainage anomaly studies and seismic surveys to home in on more optimized well locations in its search for more gas to serve Cook Inlet area markets.

*continued on page 32*

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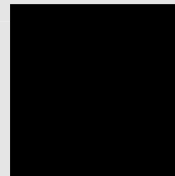
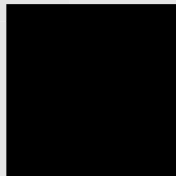
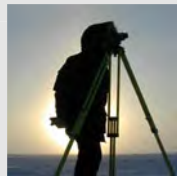
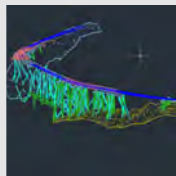
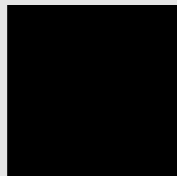
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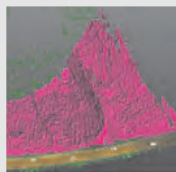
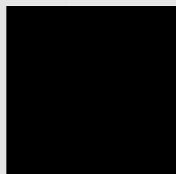
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**HILCORP** *continued from page 30*

Hilcorp has also been doing preliminary exploration in the lower Cook Inlet and on the west side of Cook Inlet on the Iniskin Peninsula, looking at the oil and gas potential of those areas.

Two things could upset the pace of the company's exploration plans: Covid-19 restrictions and the challenge of securing funds for oil and gas exploration and development.

## Seeking partners

Both Hilcorp and the Alaska Department of Natural Resources had booths at NAPE in early February 2020, before the oil price crash and before much was known about the coronavirus. DNR Commissioner Corri Feige, who spent time at Hilcorp's booth discussing the company's Cook Inlet and North Slope prospects, talked to Petroleum News after the annual prospect conference and expo.

Among other things, "We talked about as cold as this winter has been they have been producing all out so they're very excited about new Cook Inlet gas prospects," she said, as well as "the new prospects they have down in the southern waters in Lower Cook Inlet."

Feige said Hilcorp officials are "feeling very bullish about both oil and gas down there. They were actively talking to people visiting their booth about it."

On hand in the Hilcorp booth were four geoscientists and landmen knowledgeable about opportunities in Alaska: Kevin Tabler, Jim Shine, Dave Buthman and Steve Dietz.

"We've seen a shale mania craze at the last several NAPES, but now we are seeing a shift. Companies are looking for ways to balance their portfolios ... to get conventionals back in the mix ... and Alaska has an abundance of those," Feige said.

Looking at Hilcorp's various agency filings, the company's next Cook Inlet basin exploration well will most likely be on-shore near Anchor Point at Whiskey Gulch, but the company has other more distant opportunities, such as the Iniskin Peninsula, outer continental shelf leases in Lower Cook Inlet and the 1002 area of the Arctic National Wildlife Refuge where the KIC well and Native leases it shares with Chevron give Hilcorp valuable insights on the area's potential.

## Iniskin Peninsula

With a huge geologic anticline clearly visible from the air and associated surface oil seeps, the Iniskin Peninsula across Cook Inlet from Kachemak Bay seems an obvious target for oil exploration. But, since wells drilled in the early 1900s, in the 1930s and in the 1950s failed to make a commercial oil discovery in the area, the peninsula has remained dormant from the perspective of petroleum exploration.

Until, that is, 2013 when Hilcorp signaled its interest by shooting a 2D seismic survey there, a survey that for the first time revealed some information about the Iniskin Peninsula's subsurface structure and stratigraphy.

On May 23, 2017, during the Association of American Petroleum Geologists Pacific Region annual conference, Hilcorp geologist David Buthman said the company is encouraged by what it has seen on the peninsula and would be interested in drilling an exploration well there in the future.

The drilling conducted in the '30s and '50s had reached depths of 8,775 to 11,231 feet in the "up-plunge" or higher section of the anticline on the peninsula. Although oil was en-



Rig 169 at Seaview Pad during the drilling of the Seaview No. 8 discovery well, which was completed in December 2018 to a vertical depth of 10,148 feet.

countered, the flow rates were deemed to be too low for viable development, Buthman said. But modern development techniques open the area's possibilities of development, he said, noting the large thicknesses of the rock units with oil potential compensate for the poor rock permeability.

### 55,000-acre prospect

The Iniskin prospect consists of a 55,000-acre structural closure, with two potential oil and gas reservoirs, 1,292 feet and 300 feet thick, in the Middle Red Glacier formation, part of the Jurassic Tuxedni group that sourced most of the oil in the Cook Inlet oil fields. These are mud-rocks within the thermal window in which oil may be generated — they could provide tight oil targets.

The rocks have fractures that follow characteristic orientations and could transport fluids. And the nature of the rocks seems similar to the Wolfcamp shale, a tight oil source in the Permian basin of Texas, Buthman said. In addition, there are known to be numerous oil-saturated, low permeability, low porosity sandstones in the region of the Iniskin Peninsula that could make other targets.

Volcanic breccia and sandstones within the Lower Red Glacier formation also appear to provide highly prospective conventional targets.

### Offset crest

Moreover, Hilcorp's seismic data on the Iniskin Peninsula in-

dicates that the anticline on the peninsula has a surface crest offset to the west relative to the crest of the deeper structure. Consequently, the wells that were drilled into the structure many years ago missed that deeper crest, Buthman said.

He also commented that live oil was observed in eight of the seismic shot holes that were drilled on the crest of the surface structure in conjunction with Hilcorp's seismic survey.

Asked about the prospects of further investigation, Buthman said drilling on the peninsula should be straightforward but that moving the equipment and personnel to the remote location, negotiating the Cook Inlet tides at the landing point with a

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barge, would be difficult.

### Survey approved

Of seemingly more interest to Hilcorp is its nearby acreage in the federal waters of the Lower Cook Inlet, southwest of Kachemak Bay.

On May 1, 2020, the Bureau of Ocean Energy Management announced that it had issued a permit allowing Hilcorp to conduct a geohazard site clearance survey the area. The approximately 88 square-mile survey area covers portions of 11 of 14 OCS leases that Hilcorp obtained in a June 2017 federal OCS lease sale. A geohazard survey of this type is an essential prerequisite to the drilling of offshore exploration wells. Federal regulations require a hazard evaluation to be conducted over the entire area within about 1.5 miles of a well site.

BOEM said that Hilcorp expects to begin the surveying in late summer 2020 and that the survey operations must be completed by Oct. 31, 2020. The exact length of the survey timeframe will depend on the weather and on any schedule adjustments needed to accommodate the protection of marine mammals, the agency said.

A geohazard survey vessel will conduct the operation, with data being collected using equipment mounted on and towed behind the vessel. In addition to using shallow seismic equipment such as sidescan sonar, Hilcorp anticipates collecting water and seabed sediment samples, while also collecting cores from the seabed, BOEM's approval document said.

Trained observers on the vessel will monitor for marine mammals, to ensure that appropriate measures can be taken to

avoid wildlife disturbance.

### Environmental assessments

BOEM said that it had originally conducted an analysis of the potential environmental impacts of Hilcorp's likely activities, including the geohazard survey, when preparing an environmental impact statement for the 2017 Lower Cook Inlet lease sale. The agency determined that this analysis was sufficient to enable approval of Hilcorp's survey permit application without further review.

In July 2019, the National Marine Fisheries Service issued a letter of authorization for the unintended disturbance by Hilcorp of marine mammals during the company's anticipated oil and gas activities throughout the Cook Inlet over the following five years. Those activities include conducting a 3D seismic survey in the Lower Cook Inlet in 2019 or 2020; conducting an OCS geohazard survey in the Lower Cook Inlet in 2020 or 2021; and drilling two to four exploratory wells between February and November in 2020 through 2022.

Each well would take 40 to 60 days to complete and would require a jack-up rig, the letter of authorization said. The newly approved plan for the geohazard survey encompasses five potential well locations.

### Seismic, jack-up

Hilcorp conducted its planned offshore 3D seismic survey during the summer of 2019.


In March 2019, Buthman said Hilcorp was working to bring the Seadrill West Epsilon jack-up rig to Cook Inlet for the drilling. There are two jack-up drilling rigs currently stationed in the Cook Inlet region: the Spartan 151 and Randolph Yost. But both rigs are apparently limited to maximum water depths of 150 feet.

Mike Dunn, Hilcorp development manager, said that the West Epsilon rig can drill to subsurface depths of 25,591 feet in water depths up to about 393 feet.

### Highly prospective

Although some distance south of most of the producing Cook Inlet oil and gas fields, the area of the planned drilling is

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north of the Augustine-Seldovia arch, a geologic structure to the south of which the thick Tertiary rock sequence hosting the producing fields of the region thins out.

The successful Cosmopolitan oil field lies under the nearshore waters of the Inlet immediately to the northeast, near where Hilcorp is planning to develop its new Seaview gas field. Underneath the Tertiary sequence lies a thick sequence of Mesozoic strata that also have known oil potential.

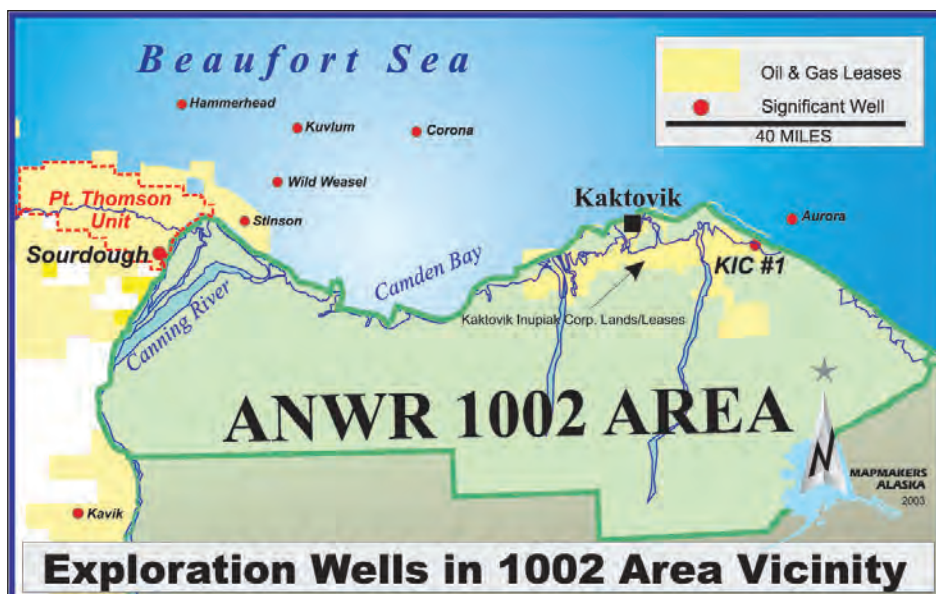
Buthman said Hilcorp is particularly interested in what it refers to as the Blackbill prospect, an oil prospect penetrated by ARCO's Raven No. 1 well in 1982. The prospect, about halfway across the inlet, due west of the town of Homer, contains a known oil resource in a Cretaceous reservoir within the Mesozoic sequence, Buthman indicated. He said that Hilcorp's 2019 3D seismic survey had revealed a 65,000-acre, four-way closure with the oil discovery at the top.

### Anchor Point gas fever

While Hilcorp employs a host of modern high tech and traditional exploration techniques, its study of drainage anomalies on the Kenai Peninsula led the way to the Anchor Point area.

The Swanson River field discovery by Richfield in the late 1950s is credited with sparking the modern oil industry in Alaska, which in turn built the case for statehood.

Soldotna Creek wraps around the main producing part of the Swanson River field, Buthman said in a March 17,



2020, presentation.

"It's hard to avoid seeing the importance of drainage anomalies when you see this," Buthman said. "A full half of the production of Swanson River has come from this circular drainage anomaly."

Happy Valley has a nosing drainage anomaly where Deep Creek flows that reveals a surface expression of the structure, he said.

"The discovery we just made at Seaview, you see the same sort of thing with the Anchor River," he said. "We don't have outcrops there, but we still see the same nosing."

Over the last few years, Hilcorp has been securing mineral rights around the Anchor River from the state as well as from private mineral holders and public entities.

The company has drilled several stratigraphic test wells at Whiskey Gulch on the southern Kenai Peninsula just north of Anchor Point, including some in June 2020.

Petroleum News sources indicate Hilcorp is in the process of finalizing a location to drill its first Whiskey Gulch exploration well; something the company is hoping to do in 2021. Hilcorp would not confirm that information.

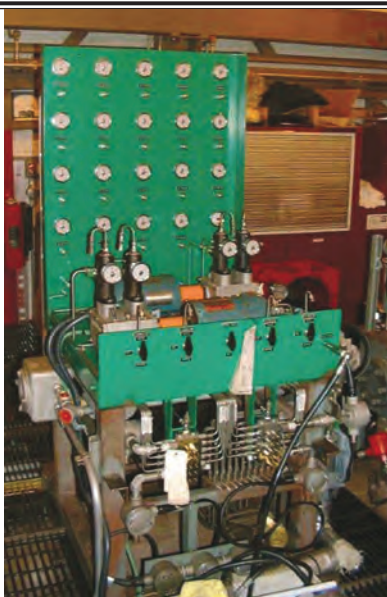
### ANWR 1002 area

Through its 2020 purchase of all BP's upstream oil and gas assets in Alaska, Hilcorp has unique access to valuable geological data regarding the ANWR 1002 area, which is a 1.57-million acre strip of

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The Hilcorp Monopod Platform in Cook Inlet



HILCORP continued from page 35

coastline that was set aside because of its petroleum potential by Congress in 1980 when the 19 million-acre wildlife refuge was created.

Operator Chevron and BP were 50-50 partners in the KIC No. 1 well, which was drilled in the mid-1980s and remains the only well in the 1002 area. The well was drilled over two winter seasons to a depth of 15,193 feet at a cost of more than \$40 million. It is on 92,000 acres of Native land within the 1002 area that the partners leased from Arctic Slope Regional Corp., which owns the subsurface oil and gas mineral rights, with the village corporation in the area, Kaktovik Inupiat Corp., owning the surface; hence the well name KIC.

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*Among other things, Hilcorp's exploration tool chest includes airborne gravity gradiometric and magnetic surveys, along with geologic field surveys, drainage anomaly studies and seismic surveys to home in on more optimized well locations in its search for more gas to serve Cook Inlet area markets.*

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The BP acquisition also means Hilcorp is part of a consortium of companies that have access to 2D seismic data in ANWR, along with Chevron, Anadarko, ConocoPhillips, ExxonMobil, Hess, Marathon, Murphy, Oxy, Shell and Total.

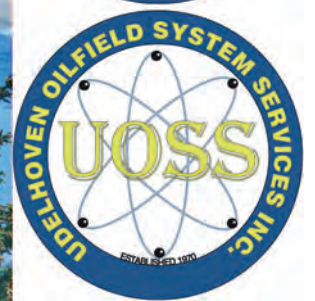
In addition to BP, Chevron and ASRC, a handful of state of Alaska geoscientists have been able to see KIC well data.

When BP and Chevron renewed the 92,000-acre Native lease in 1999, Neil Ritson, then-exploration vice president for BP in Alaska, was quoted as saying, "ANWR offers the greatest potential for a world-class oil discovery on the North Slope."

Quoted in the same press release Dave Birsa, then Chevron's exploration manager for Alaska, said what state geoscientists have continued to echo: "The ANWR coastal plain ... is on trend with the prolific oil fields of the central North Slope and has significant geological potential." ●

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# Jade advancing 2021-22 Sourdough well

*Alaska independent reschedules drilling at Eastern North Slope prospect adjacent to ANWR 1002 area to protect project economics*

By **KAY CASHMAN**  
Petroleum News

A couple of days after it was filed on March 17, 2020, Alaska's Division of Oil and Gas approved Jade Energy's second Plan of Development for the undeveloped Sourdough prospect on the southeastern edge of the Point Thomson unit.

Jade is both the majority owner and operator of PTU Tract 32 in Area F of the eastern North Slope lease ADL 343112.

Tract 32 holds two mid-1990's oil discovery wells, Sourdough 2 and 3, both drilled by BP, which in 1997 estimated the prospect held 100 million barrels of recoverable oil. The Sourdough prospect runs along the western edge of the Arctic National Wildlife Reserve 1002 area, which is a 1.57 million-acre strip of coastline that was set aside because of its petroleum potential by Congress in 1980 when the 19 million-acre wildlife refuge was created.

The essential difference in Jade's second POD, which covers the period April 1, 2020, through Dec. 31, 2020, is to drill the first new Sourdough appraisal well, Jade 1, in the winter of 2021-22, versus 2020-21, a delay triggered by COVID-19, depressed oil prices and the threat of a state tax increase that is part of a ballot initiative due to be voted on Nov. 3, 2020.

Jade worked closely on the second POD with the division in order to come up with a plan that maintained the economic viability of the project, which is the farthest east of all North Slope developments.

Division Director Tom Stokes told Petroleum News March 23, 2020, that one of the reasons for the drilling delay is scheduling challenges, such as barging in equipment and ice road construction, both of which can only be done during different specific and limited periods of time.

## Opstad in charge of Jade

Jade's members and managers are Anchorage-based Erik Opstad and Castle Rock, Colorado-based Greg Vigil, who each own 50% of the company.

Opstad, who oversees Jade's operations in Alaska, is a state of Alaska certified professional geologist who has worked the North Slope for 35 years, including a stint with BP in various roles and as a principal and general manager of Savant Alaska.

Currently Opstad heads up operating subsidiaries of 88 Energy in Alaska (see 88 Energy profile in this issue of The Explorers magazine).

## Working the issues

Jade initially submitted its second POD on Oct. 2, 2019, but a

**NAME OF COMPANY:** Jade Energy LLC  
**COMPANY HEADQUARTERS:** P.O. Box 112212, Anchorage, Alaska 99511  
**TOP ALASKA EXECUTIVE:** Erik Opstad  
**TELEPHONE:** 907-244-5210  
**EMAIL:** Erik.Opstad@Gmail.com



**ERIK OPSTAD**

month later Stokes granted an extension of the first POD until March 31, 2020, to give Jade and the division time to consider several issues related to the economic viability of the proposed project.

Initially, the division requested resubmittal of the second POD by Jan. 31, 2020, but in subsequent email correspondence between Jade and the division, the resubmittal date was extended to give them more time.

During this period, the Alaska independent also continued to work on permitting, which began the summer before.

On Feb. 29, 2020, Jade's exploration/appraisal program oil discharge prevention and contingency plan application package was deemed complete by the Alaska Department of Environmental Conservation.

## SE portion of Area F

Area F of the PTU was created by the terms of the Point Thomson Unit Settlement Agreement between PTU operator ExxonMobil and the other owners. Area F consists of 7,647 non-adjacent acres in the northeastern and southeastern corners of the PTU.

Jade became majority owner and operator of PTU Tract 32, ADL 343112, in the southeastern portion of Area F, by agreement with ExxonMobil Alaska Production Inc. in mid-2018.

Potential Brookian reservoirs have been encountered by numerous wells that have been drilled in and near the PTU since the 1970s. Sourdough 2 was drilled to a true vertical depth of 12,562 feet and was plugged and abandoned. Sourdough 3 was drilled to 12,425 feet TVD and was suspended.

In addition to the data derived from these wells, various 3D seismic surveys have been acquired and interpreted over Area F.

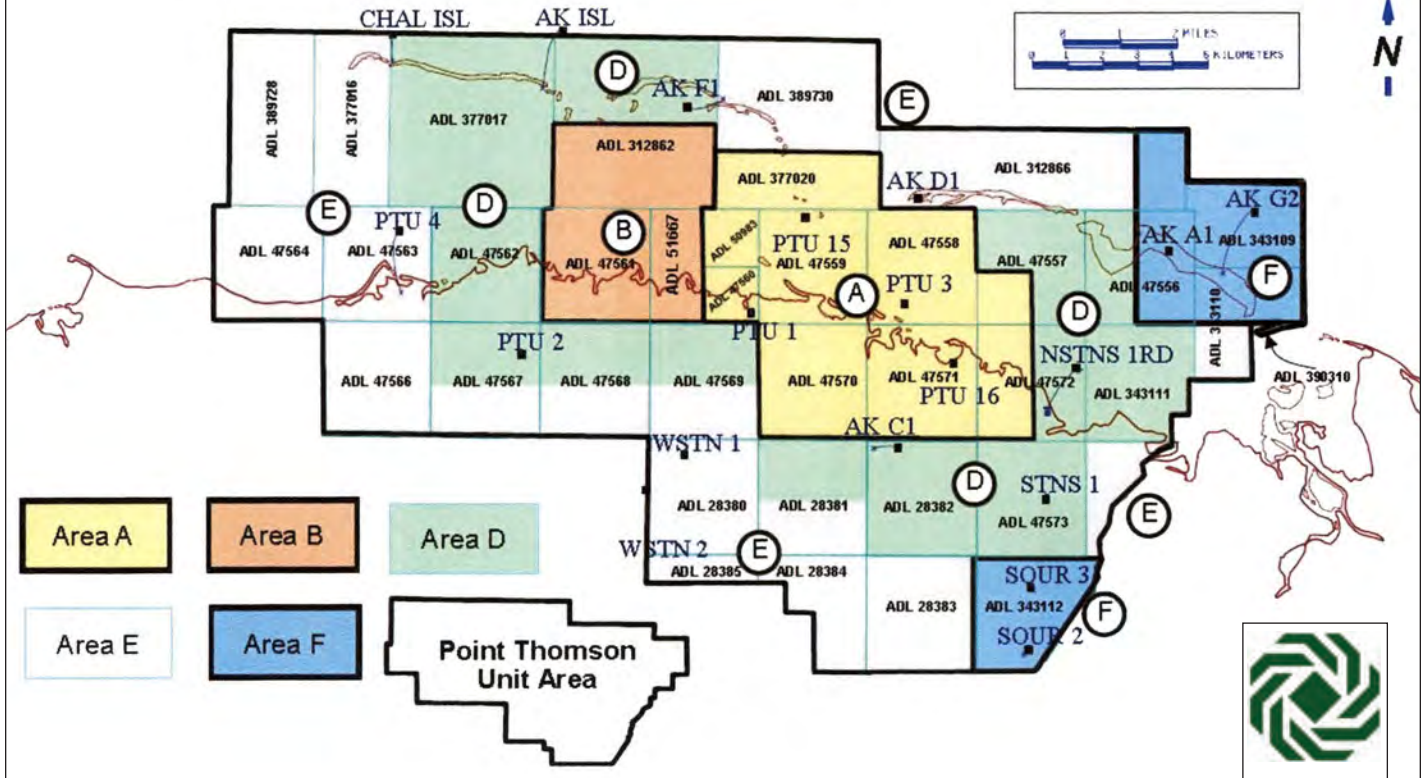
Jade acquired new compressive sensing imaging, or CSI, seismic 3D data from the area during the 2017-18 winter season with parameters optimized to characterize Brookian strata. The CSI 3D survey was the first of three field studies.

## Delineated by 5 wells

Jade told the division the Brookian reservoir in Area F had been delineated and characterized by five wells that were drilled

*continued on page 40*

# Point Thomson Unit



in and around the Point Thomson unit since the mid-1970s.

Three of the wells were in the northeast corner of the unit and were summarized as follows:

- Alaska State A-1 on ADL 047556 was drilled by Exxon and reached a 14,206-foot TVD in September 1975 and was plugged and abandoned. That data was available to the public from the Alaska Oil and Gas Conservation Commission, or AOGCC.
- Alaska State A-2 is immediately adjacent to Alaska State A-1 and was drilled as a cutting's disposal well by Exxon in 1995 to 2,364-foot TVD and was plugged and abandoned in March 2002.
- Exxon spud Alaska State G-2 from ADL 343110 and directionally drilled the well north to reach a bottom-hole at 14,340-foot TVD within ADL 343109 in August 1983. The well was subsequently plugged and abandoned, but AOGCC granted the well extended confidentiality.

The other two wells that characterized Point Thomson's Brookian reservoir were, of course, Sourdough 2 and 3 and both were granted extended confidentiality by AOGCC.

### Dredging needed

In the first POD, Jade identified a series of 12 goals for 2019.

"Generally speaking, we fully or partially achieved 92% of the goals ... while 8% of the targets were missed. The misses were largely the result of new information provided by the second field study conducted by Jade to support appraisal operations," the company said in its March 17 filing.

In that case, a bathymetric survey of the PTU service pier approach showed that dredging of the sea bottom would be required to land a barge carrying the drilling rig.

Not only was it too late in the 2019 summer season to organize and execute such a dredging operation, but the campaign would require Jade to obtain a federal permit from the U.S. Army Corps of Engineers, potentially a six-month exercise.

Based on its interpretation of area data, Jade planned to drill the Sourdough appraisal well in the winter 2020-21 drilling season utilizing existing PTU infrastructure to conduct its operations, supported by the construction of additional Jade infrastructure, such as an ice road. However, given the circumstances, Jade was unable to deliver on its goal of mobilizing a rig, equipment and materials to Point Thompson.

Therefore, in August 2019 Jade elected to delay its drilling program by one year — a delay that "has in no way diminished Jade's enthusiasm for the project and we continue moving forward on numerous fronts," the company said in its second POD filing.

### Third field study

In September 2019, Jade conducted its third field study to "evaluate suitability of the proposed Jade 1 drillsite," which included a helicopter survey of the ice road alignment between the PTU road system and the drill pad.

Jade launched a program designed to interface with state and North Slope Borough stakeholders that would ultimately deliver a full permit package for the proposed project.

The company's administrative goals and objectives for the second POD do "not differ dramatically" from those in the first POD.

Seismic data evaluation will continue in order to fully characterize the resource. Some of the work will focus on selecting additional delineation and development well locations particularly



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The export pipeline from the Point Thomson field has the capacity to handle up to 70,000 barrels of liquids per day but can be expanded.



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in any “expansion” areas that may be added to ADL 343112 resources through negotiations with the other PTU working interest owners, Jade said.

Well design, permitting and putting together third party agreements will also continue, including designing and permitting for drilling Jade 1 in the 2021-22 winter season.

### Unique opportunity

Jade’s plans to mobilize a drilling rig to Point Thomson by barge from the Deadhorse area presents a “unique opportunity to capture significant savings versus what would typically be spent on a traditional ice road focused rig mobilization scenario,” the company said in its second POD.

“Capturing such savings is key to the economic viability of the project. However, given seasonality drivers, many important tasks are limited to being executed only during very specific calendar windows; barging requires open water, ice road construction requires -20°F temperatures and getting men and equipment to the Jade 1 drillsite requires both conditions,” Jade said.

### Summer 2020 activities

In summer 2020 Jade plans to continue its wellsite work and permitting, including developing detailed construction plans for the ice road and the Jade 1 drill pad. Additionally, it will move to secure necessary equipment and contract services required to build out its infrastructure. One specific field task will be the August installation by helicopter of several satellite link enabled thermistor stations along the ice road alignment and drill pad that will report ground temperature at various depths and snow cover to assist in construction planning.

A second bathymetric survey of the PTU service pier approach will be conducted by survey contractor HDR to confirm conditions ahead of a summer 2021 Corps permitted dredging campaign. Alternatively, Jade may use Bell and Associates to run a similar survey from sea ice earlier in the year which would provide data ahead of breakup.

The dredging operation will follow later in the summer.

### Winter 2021-22 drilling

The Jade 1 drilling campaign in the winter of 2021-22 will utilize a medium sized mono-body rig — either Nordic Rig 3 or a similar unit. Weighing approximately 2.7 million pounds Nordic Rig 3 is a significant barge load, but once landed the rig will move efficiently using existing infrastructure and newly constructed Jade ice roads and arrive ready to drill with little additional rig-up work, Jade said.

“With its own secondary containment, the rig presents an environmentally responsible package, particularly when underlaid by a Polystar berm system. The rig features a split pipe shed that allows casing to be run on one side and drill pipe run on the opposite side. Automated pipe handling equipment raises and lowers tubulars into either side of the pipe shed. Capable of standing back 16,000 feet of 4” drill pipe and hoisting 464,000 pounds the rig is ideal for medium depth appraisal well programs such as Jade 1,” the company said in its March 17, 2020, second POD filing.

Jade intends to drill a vertical 8½-inch borehole to approximately 12,750 feet. Drilling to that depth will penetrate “all of the prospective Brookian sand target that lay between 11,000 feet and the Hue Shale at ~12,500 feet while provide sufficient rat-hole to support subsequent wireline logging.”

Formation evaluation will employ a combination of logging while drilling, or, LWD, and wireline logging, or WL, programs that will include the extraction of rotary sidewall cores, Jade said.

“Given the probability of success, Jade expects to run casing, perforate the zone or zones of interest, then flow back the well for 24-hours. Naturally the testing program details will be dependent on the formation characteristics of the section penetrated,” the company said. ●

Contact Kay Cashman  
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# Oil Search leads in hunt for the Nanushuk

*Company operates some of the most promising Alaska North Slope acreage with Nanushuk reservoirs; its Stirrup 1 exploration well one of best in play*

By **KAY CASHMAN**  
Petroleum News

Even though Oil Search does not have any exploration wells planned for the 2020-21 North Slope winter drilling season due to uncertain market conditions, the independent's Stirrup 1 exploration well drilled in the previous winter season has one of the highest flow rates of any Nanushuk single-stage stimulation of a vertical well on the North Slope to date, the company said April 21, 2020.

Approximately 7-1/2 miles west of the 2017 Horseshoe 1 discovery well and almost 28 miles southwest of Oil Search's proposed Pikka unit development, the Stirrup 1 well successfully penetrated the Nanushuk reservoir and encountered an oil column with a net pay of 75 feet.

The wellbore was cored, perforated through a single-stage simulation and shut-in for six days to enable pressure build up prior to testing in which it flowed at a stabilized rate of 3,520 barrels of oil per day, exceeding company expectations.

While further appraisal will be required, Stirrup is a direct analogue to the Horseshoe Nanushuk discovery and as such the company said the new find could underpin a possible standalone Horseshoe development. Or, it could represent a low cost tie-back option to the Pikka development

## Mitquq exceeds expectations

The other exploration wells drilled the same winter were the Mitquq 1 and its sidetrack Mitquq 1 ST1 — its flow test also exceeding Oil Search's expectations.

After discovering oil in the primary Nanushuk reservoir, the Mitquq 1 well was drilled into the secondary Alpine C formation objective where it encountered 52 feet of net hydrocarbon pay, comprising 31 feet of net oil pay and 21 feet of net gas pay. A comprehensive suite of wireline logs, pressure data and hydrocarbon samples were collected prior to the wellbore being plugged back to allow for the drilling of a sidetrack, Mitquq 1 ST1, to appraise the Mitquq 1 Nanushuk discovery.

The sidetrack intersected the Nanushuk formation and encountered approximately 172 feet of net hydrocarbon pay, including a 29-foot gas cap.

The wellbore was logged and cored and in late March a flow test was conducted with a single-stage stimulation. The test included a clean-up, flow period and a six-day pressure build-up, with the well achieving a stabilized rate of 1,730 bpd.



**KEIRAN WULFF**



**BRUCE DINGEMAN**

**NAME OF COMPANY:** Oil Search

**COMPANY HEADQUARTERS:**

Perth and Sydney, Australia

**TOP COMPANY EXECUTIVE:**

Keiran Wulff, managing director

**ALASKA SUBSIDIARY:** Oil Search (Alaska) LLC

**ANCHORAGE OFFICE:** Two floors in BP building, 900 E Benson Blvd., Anchorage, AK 99508

**TOP ALASKA EXECUTIVE:** Bruce Dingeman, president, Oil Search Alaska

**TELEPHONE:** 907-375-6900

**WEBSITE:** [www.oilsearch.com](http://www.oilsearch.com)



Located 5.6 miles east of the proposed central processing facility for the Pikka unit development, Oil Search describes the Mitquq prospect as a "high value tieback" to future Pikka infrastructure.

The exploration wells were successfully plugged and abandoned as planned, with the rigs and crews safely demobilized from the site, concluding Oil Search's second North Slope drilling program.

## Reducing breakeven cost

Due to the decline in oil prices and COVID-19 concerns, the company delayed its final investment decision on Pikka unit development. Expected in the second half of 2020, the FID has been deferred until there is "improvement in market conditions," per Oil Search.

The additional time "will allow further value engineering and optimization of the development to take place, with a focus on reducing the breakeven of the project and the results of the Mitquq and Stirrup wells to be integrated into future planning," Oil Search said April 21, 2020.

In February 2020, Oil Search began a company-wide strategic review to re-evaluate its long-term vision, strategic focus and pathway for delivering superior shareholder returns. Given the troubling market conditions, the firm's short-term focus was on stabilization, resulting in cost cutting, US\$700 million in capital-raising and lowering the cost of development.

The result of those actions, Managing Director Keiran Wulff said July 1, 2020, would ensure Oil Search's long-term survival.

He also noted that "good progress is being made to reduce the breakeven cost of the Pikka unit development."

Outside Alaska Oil Search lowered its production cost guidance for 2020 to around \$10.50 per barrel of oil equivalent before one-off restructuring costs, down from its previous guidance of \$12.48 per boe in 2019. This, however, did not apply to Alaska, as the com-

*continued on page 45*



*Petrotechnical Resources Alaska*

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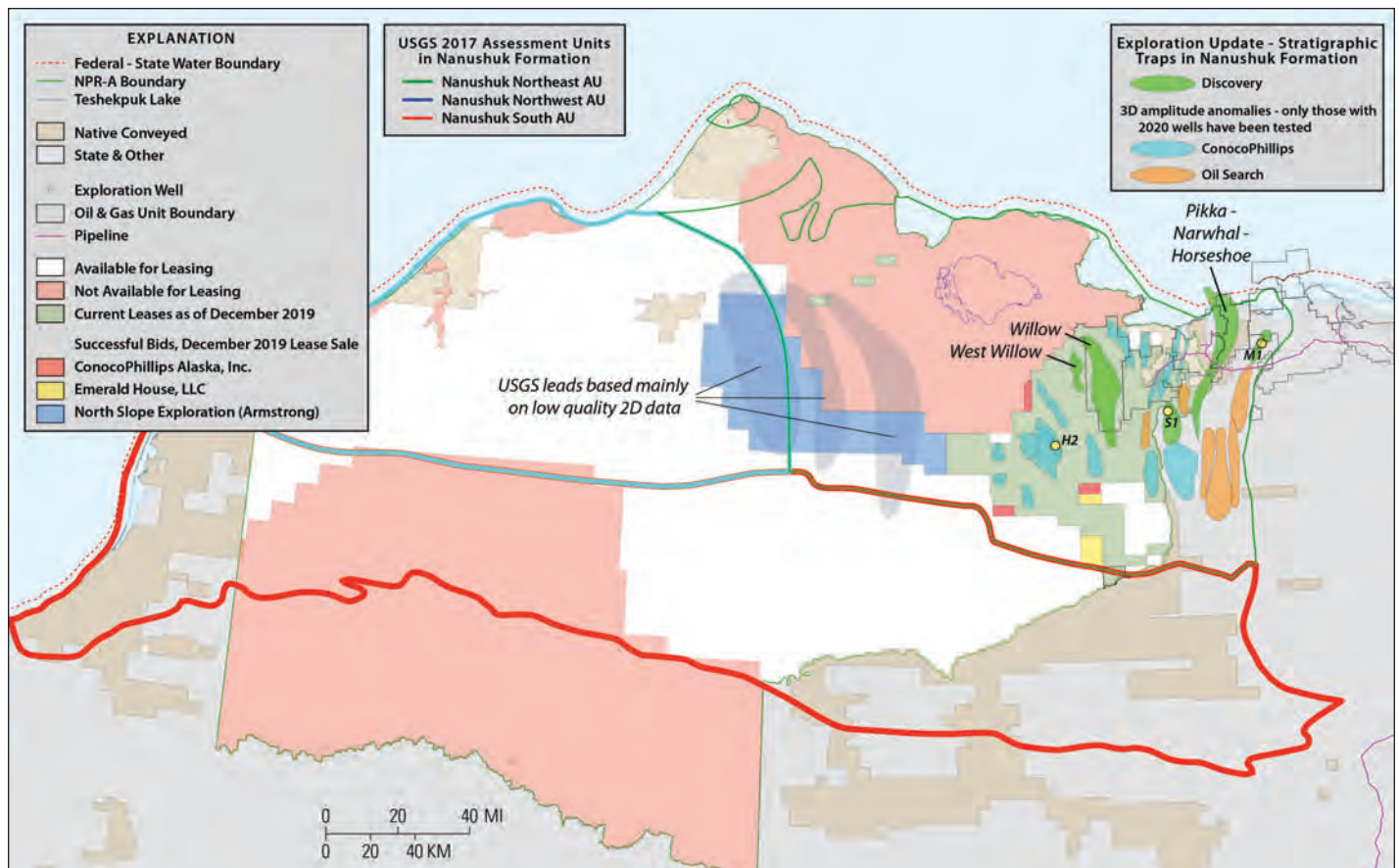
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Discoveries and seismic anomalies in the Nanushuk formation. M1, S1 and H2 are the Mitquq, Stirrup and Harpoon exploration wells drilled in early 2020. USGS sees significant potential for finding oil prospects in three areas (marked in grey) to the west of current exploration activity.

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## OIL SEARCH *continued from page 42*

ppany does not currently have any North Slope production.

"The Pikka project was premised on a per barrel breakeven cost in the mid \$40s," Anchorage-based Amy Burnett, Oil Search's manager of U.S. media and communications, later explained. "We are working to reduce the project breakeven cost to ensure the Pikka development is cost-competitive and commercially viable in a lower oil price environment."

### Some layoffs

And although Oil Search halted its plans for limited early production of Pikka in 2022, choosing instead to concentrate on full field development to go online in 2025 with a 135,000-barrel facility, Alaska fared comparatively well in terms of layoffs.

The latest round of layoffs announced by Wulff on July 1, 2020, did not involve any Alaska workers.

However, some Oil Search workers were laid off in March and April.

"While seasonal contractors associated with our winter drilling and exploration programs represent the majority (of those March and April layoffs), we have reduced full-time (Alaska) employees by about 15%," which brought the local total to 150 individuals, Burnett told Petroleum News.

All told, Wulff said full time employees will be reduced company-wide from 1,649 as of March 1, to 1,222, with a further 137 staff members to be transitioned out by the end of the year; none of those expected to be from Alaska.

"The painful decisions we have taken to optimize our organizational structure, enhance efficiencies and reduce operating costs have not been made lightly. They are the result of extensive studies aimed at ensuring we have an organizational structure that not only makes us more resilient to oil and gas price fluctuations but also embeds a culture of continuous improvement, operational excellence and strict fiscal discipline," Wulff said.

### Surrendered 140 leases

The company also halted formal marketing activities related to its planned sell-down of a 15% interest in the Pikka area, although Oil Search said it is continuing discussions with "parties that had expressed interest prior to the oil price fall."

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*The wellbore was cored, perforated through a single-stage simulation and shut-in for six days to enable pressure build up prior to testing in which it flowed at a stabilized rate of 3,520 barrels of oil per day.*

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On June 23, 2020, Oil Search relinquished 130 leases on Alaska's North Slope to the Alaska Department of Natural Resources' Division of Oil and Gas, which was acknowledged in a letter from Division Director Tom Stokes on July 9, 2020, who said the relinquishment takes effect on the filing date.

The surrendered acreage will be included in the next state North Slope and Beaufort Sea areawide lease sales; a date that has not yet been noticed, but the 2019 sales were jointly held in December.

The leases cut loose are "largely located on the edges of the company's western lease area," Burnett told Petroleum News July 15, 2020. "The reduction was in areas we have determined to be less prospective than other leases in our Alaska portfolio."

"Even with the relinquishments, Oil Search continues to be among the top three leaseholders on Alaska's North Slope," she said.

### Oil Search, not Repsol

On June 17, 2020, Alaska's Division of Oil and Gas posted the first amendment to the Pikka unit agreement from operator Oil Search. The amendment, filed June 1, leaves no doubt that Oil Search is the operator of the Pikka unit, not its partner Repsol E&P USA even though Oil Search will be farming out a 15% interest to a third party at some point in the future, leaving Repsol with the larger chunk of ownership.

A working interest owner in the North Slope unit, Oil Search filed the amendment on behalf of itself and the other unit working interest owner, Repsol. Although the initial agreement declared Oil Search the operator, mentions of Repsol being the operator still appears in random documents.

The June 1, 2020, amendment, which was signed by both Oil Search (Alaska) President Bruce Dingeman and Repsol (signa-

*continued on page 46*



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## OIL SEARCH *continued from page 45*

ture illegible), removes all doubt about which company is the operator. It also updates relevant addresses and reflects the current working interest ownership of the Pikka unit — Oil Search 51% and Repsol 49%. The amendment was mailed to both Alaska Department of Natural Resources Commissioner Corri Feige and to Rex Rock Sr., president of Arctic Slope Regional Corp.

The North Slope Pikka unit was formed effective June 1, 2016, by then-working interest owner and operator Repsol, along with working interest owner Armstrong Oil & Gas subsidiary 70&148 LLC, which brought Repsol into the play, followed later by Oil Search.

DNR's Division of Oil and Gas approved the first expansion of the Pikka unit on Nov. 29, 2016, and ASRC approved it on Feb. 28, 2017.

In a March 7, 2018, letter to DNR and ASRC, Oil Search was designated as successor unit operator in accordance with an article in the agreement.

DNR and ASRC approved the change in operatorship on March 20 and 21, respectively.

A revised Pikka unit operating agreement between the working interest owners was filed with DNR and ASRC on Oct. 9, 2019. Then, a revised Exhibit A was provided as an attachment to that revised operating agreement.

Pikka's expected peak of 135,000 barrels per day does not include output from what is anticipated to be Oil Search's next North Slope development from the nearby Horseshoe discovery.

### Houseknecht: upended expectations

The Nanushuk forms part of the Brookian sequence, the

youngest and shallowest of the major North Slope petroleum bearing rock sequences. Although rocks of the Brookian are found across the entire North Slope, the Nanushuk is found mainly in the more westerly part of the region. (See full story in the May 31, 2020, issue of Petroleum News, titled "Exciting outlook.")

Following the discoveries of the Prudhoe Bay and Kuparuk River fields in rock reservoirs much older and deeper than the Nanushuk, subsequent exploration mainly focused on these deeper rocks, with Brookian strata such as the Nanushuk generally being ignored.

Until that is 2015, when Armstrong took a contrarian view of conventional North Slope exploration strategies, brought in a well-heeled partner, Repsol, and made the Pikka discovery to the east of the Colville delta. That discovery upended expectations for potential oil volumes in the Brookian.

Although the COVID-19 pandemic brought an early end to the 2019-20 winter exploration season on the North Slope, there is continuing interest in oil discovery opportunities in the Nanushuk formation, the focus of major new developments at Pikka and Willow. While recent exploration drilling by Oil Search and ConocoPhillips is shedding further light on this intriguing new play, companies such as Armstrong, 88 Energy and Borealis Alaska Oil are also looking to test further opportunities of a similar character to the established finds.

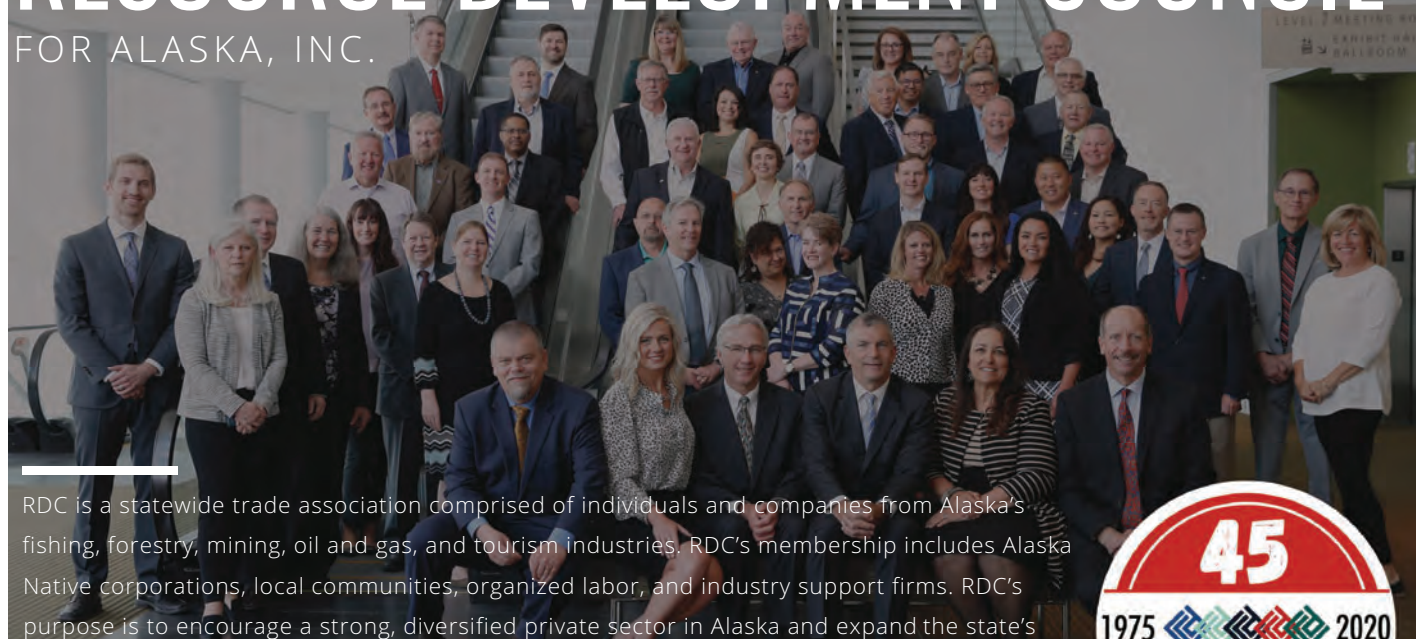
The most recent major leasing activity was Armstrong's purchase of a significant block of leases in the 2019 National Petroleum Reserve-Alaska lease sale, U.S. Geological Survey geologist



DAVE HOUSEKNECHT

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Dave Houseknecht told Petroleum News in a May 2020 overview of Nanushuk exploration activity. Under Oil Search and Armstrong's Alaska agreement, Oil Search has the right to acquire a 50% interest in the leases and to operate them, which is what has happened to date.

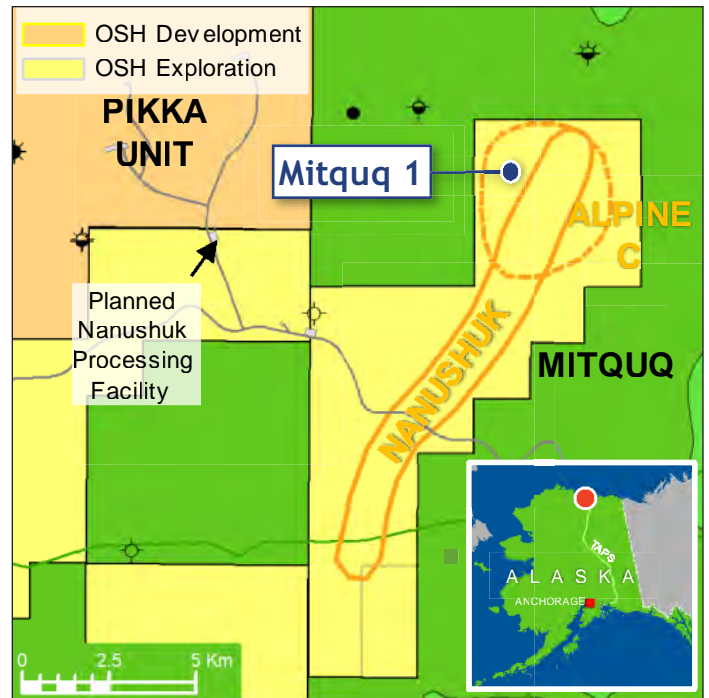
### Pikka-Narwhal-Horseshoe trend

There has been continuing exploration drilling along the trend of that original Pikka discovery. An oil discovery by the Horseshoe well, drilled in 2017 by Armstrong and Repsol to the south of Pikka, established what became referred to as the Pikka-Horseshoe trend, Houseknecht said. Evidence of pressure communication in the oil along this trend suggests the existence of an interconnected reservoir system.

Successful nearby exploration drilling by ConocoPhillips has resulted in what that company refers to as the Narwhal trend. USGS now refers to this complete system of discoveries and associated sand bodies as the Pikka-Narwhal-Horseshoe trend, Houseknecht said.

However, although Armstrong has indicated that an oil gravity gradient suggests that the reservoirs at Horseshoe and Pikka are in communication with each other, there has been no public statement regarding possible pressure communication between Horseshoe and the nearby Putu and Stony Hill exploration wells that enabled ConocoPhillips to identify its Narwhal trend, Houseknecht said.

And the possibility of reservoir communication between these various discoveries is intriguing, given the potential for significant complexities in lease unification, development strategies and the determination of resource ownership, he said. Moreover, with the likely need for hydraulic fracturing of the relatively low



permeability reservoirs, there is the potential for pathways to open between adjacent reservoir rock bodies, Houseknecht commented.

Also, the shelf margins that form the reservoirs tend to be more separated to the south, while tending to converge to the north, thus leading to complex reservoir geometry, he added.

*continued on next page*

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Mitquq drilling.



## OIL SEARCH *continued from page 47*

To the west of the Colville River delta, in the northeastern NPR-A, ConocoPhillips has been conducting drilling in its Willow and West Willow Nanushuk discoveries. In the 2019-20 winter season the company drilled two further appraisal wells (Tinmiaq wells), leading to a total of 12 wells in the discoveries and presumably meaning that the discoveries are now well delineated, Houseknecht said.

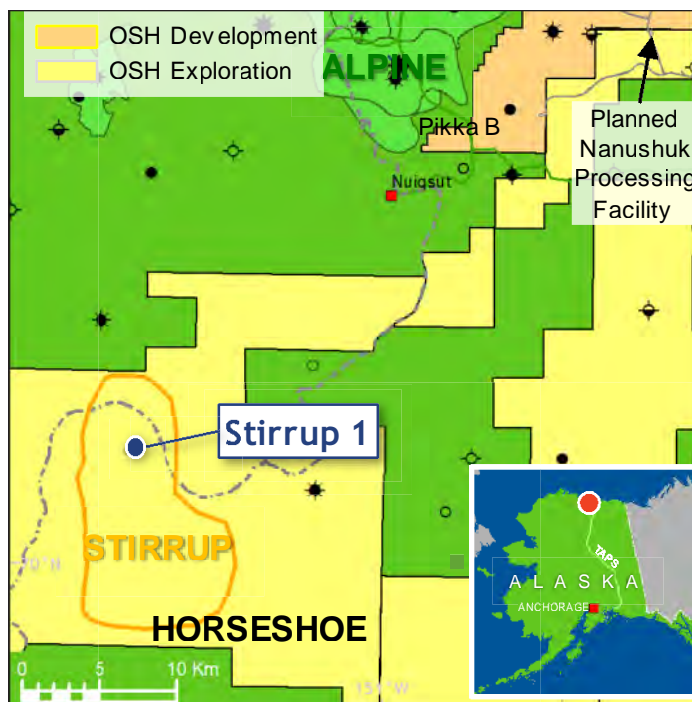
Publicly available information suggests recoverable oil volumes of 1,000 million to 1,500 million barrels in the Pikka-Narwhal-Horseshoe trend and 400 million to 750 million barrels in Willow and West Willow, he said.

### Absence of water intriguing

Regarding Oil Search's 2019-20 winter drilling east of the Colville River, Houseknecht said the Mitquq well, to the east of Pikka, encountered oil both in the Nanushuk and in deeper Alpine sands, noting in the Nanushuk the well penetrated 29 feet of gas and 143 feet of oil, but no water.

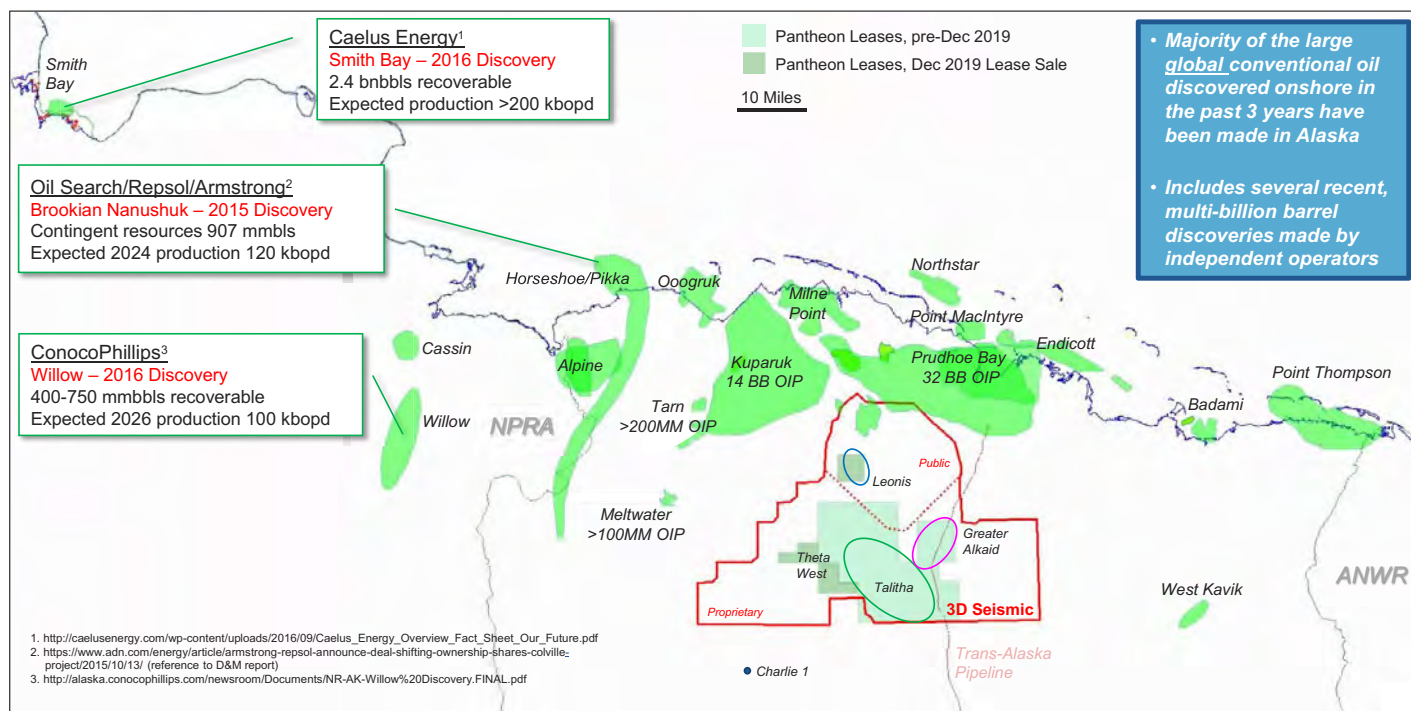
The absence of water is intriguing, he said, suggesting that there could be a reasonably sized oil accumulation to the south, depending on how far the reservoir extends. Curiously, the well does not appear to be associated with any seismic amplitude anomaly depicted on Oil Search's publicly published maps, Houseknecht pointed out.

The Stirrup well on the other hand, located west of the Horseshoe well and some distance southwest of Pikka, is at the northern end of a seismic anomaly that has appeared in an Oil Search publication. The Stirrup well also flowed oil from its Nanushuk target. Intriguingly, Houseknecht noted, Oil Search's anomaly



map for Stirrup overlaps with the northern end of an anomaly mapped by ConocoPhillips, raising questions regarding whether both anomalies represent a single reservoir, he said. ●

Contact Kay Cashman  
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# Great Bear Pantheon gears up to drill Talitha

*Alaska independent plans exploration well in 2020-21 winter season, followed by Alkaid produce if partnering talks prove fruitful*

**By KAY CASHMAN**  
 Petroleum News

**P**antheon Resources, owner of Great Bear's North Slope oil and gas assets, is planning to drill an exploration well in its Talitha prospect in the 2020-21 winter season via its new Alaska operating arm, Great Bear Pantheon.

The Talitha 1 well will be followed by a development well at Pantheon's Alkaid project sometime in the next year. The timing of Alkaid drilling is subject to securing a farm-in partner.

The new Alkaid well has the potential to be completed as a producer via the "installation of an Early Production Unit facility," Pat Galvin, Pantheon and Great Bear Pantheon's chief commercial officer in Alaska, told Petroleum News in a July 22, 2020, email.

The company is in the process of applying for two new units, one at Talitha and one at Alkaid, he said.

Alkaid has the advantage of being located along the Dalton Highway and trans-Alaska oil pipeline which "could expedite low cost early production," Galvin said.

"Pantheon is speaking to a number of parties about partnering to jointly exploit and develop both of these projects," he said.



**PAT GALVIN**

**NAME OF COMPANY:** Great Bear Pantheon LLC

**COMPANY HEADQUARTERS:**

310 K St., Ste. 200, Anchorage, AK 99501

**TOP ALASKA EXECUTIVE:** Patrick Galvin, chief commercial officer & general counsel

**TELEPHONE:** 907-868-8070



Pantheon owns 89.2% of the Talitha project and 100% of the Alkaid project.

## Talitha offsets old ARCO well

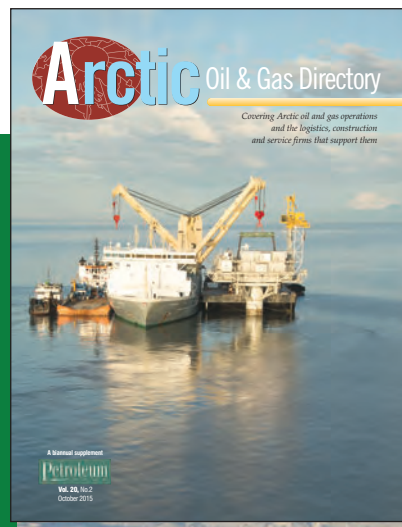
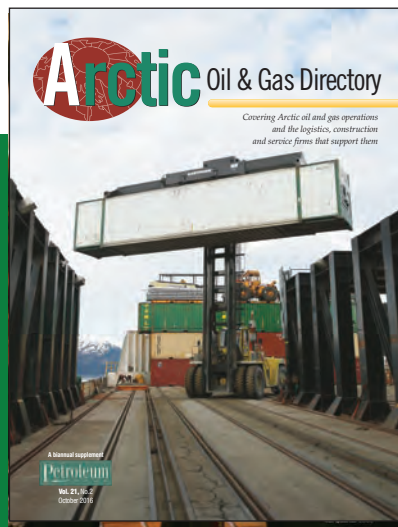
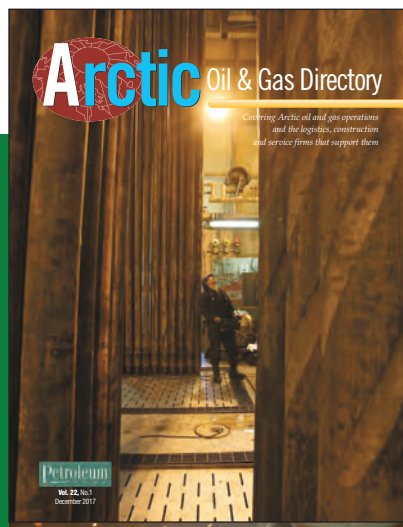
The Talitha project contains "three mutually exclusive and independent geological formations with different reservoir trap geometries, qualities and risk profiles," Galvin said.

All three formations were penetrated and confirmed to be oil bearing in the Pipeline State No. 1 well drilled in 1988 by ConocoPhillips Alaska predecessor ARCO Alaska. The Talitha 1 well will offset Pipeline State No. 1.

In late March 2020, Pantheon announced that it had completed

*continued on page 51*

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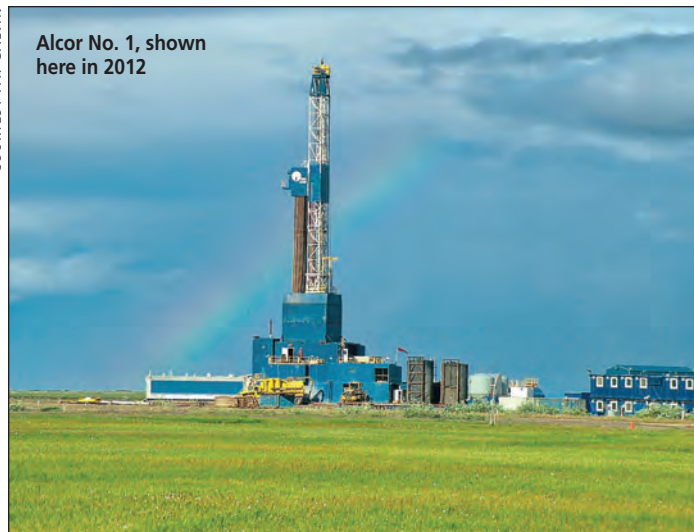


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Alcor No. 1, shown here in 2012

### **GREAT BEAR PANTHEON** *continued from page 49*

its analysis of the shallowest of these three horizons, the “Shelf Margin Deltaic,” a Brookian aged reservoir, which it estimated to contain 1.8 billion barrels of oil in place with a P50 technically recoverable resource of 483 million barrels of oil. These numbers were “significantly higher” than pre-analysis expectation, Galvin said.

The two deeper zones at Talitha, the Brookian Slope Fan System and the Kuparuk “also offer significant potential,” with the company due to complete its analysis of the Kuparuk and provide resource estimates “in the near future,” he said.

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*All three formations were penetrated and confirmed to be oil bearing in the Pipeline State No. 1 well drilled in 1988 by ConocoPhillips Alaska predecessor ARCO Alaska. The Talitha 1 well will offset Pipeline State No. 1.*

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### **Two new pads along Dalton**

In April 2020 Great Bear began permitting for two pads along the Dalton Highway, as well as filed a major amendment application for its oil discharge prevention and contingency plan. (The oil discharge prevention and contingency plan was approved under the Great Bear name in early 2017, so that name continues to be used.)

The Alaska Department of Environmental Conservation said in an April 17, 2020, public notice that the company’s existing plan addresses year-round exploration drilling from sites approved for all season drilling and winter-only exploration drilling from ice pads connected to North Slope infrastructure via the Dalton Highway and ice roads.

In its DEC application the company said the 400- by 400-foot pads would be constructed of timber rig mats, “in some cases supplemented with existing gravel pads.”

There is no date given for pad construction.

### **Four wells drilled to date**

Great Bear/Pantheon has drilled four wells off the Dalton Highway to date — three are plugged and abandoned (Alcor 1, Merak 1 and Winx 1) and one well, Alkaidd 1, is suspended.

*continued on next page*



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Talitha Ice Road 1

## **GREAT BEAR PANTHEON** *continued from page 51*

In actuality, the Winx 1 exploration well was drilled by an 88 Energy Alaska subsidiary, although permitting was submitted under Great Bear's name.

In addition to the successful testing of the Alkaid 1 well, the 2018-19 winter exploration season included drilling Winx 1 in the western block in which Great Bear cut a deal with three independents — 88 Energy, Otto Energy and Red Emperor Resources — to cover the cost of the drilling, retaining a 10% interest in the leases.

The Alcor and Merak wells were drilled in 2012, Alkaid 1 was drilled in 2015 and re-entered and flow tested the 2018-19 winter season. The suspended Alkaid 1 well is some 2-1/2 miles west of the Dalton Highway and northwest of the Phecda Road Pad site. That well was drilled from an ice pad.

Pantheon said after the well was flow tested in 2019 that it confirmed a new Brookian light oil discovery just west of the Dalton Highway. The company now views the Phecda prospect as part of Alkaid.

### **Aggressive bidding**

The state of Alaska drew 56 bids on 56 tracts in the North

Slope areawide sale Dec. 11, 2019, with Great Bear taking 17 tracts on 27,840 acres for \$849,094. The company was second only to Oil Search in the number of tracts it won.

"The new leases are strategically positioned in two areas contiguous or adjacent to our current acreage on our northern and southwestern boundaries," Pantheon said in a Dec. 12 statement, noting it had a competitive advantage given it "owns the proprietary 3D seismic which covers the leases," and had recently completed technical work.

### **Leases surrendered**

The May 2020 lease activity report from Alaska's Division of Oil and Gas reported that Great Bear Pantheon surrendered 11 leases. Four of the leases form a block on the western side of the North Slope south of the village of Nuiqsut, isolated from other company leases which are contiguous.

The other seven leases Great Bear Pantheon surrendered are a strip of leases on the northern edge of its southcentral North Slope lease block, and leases adjacent to those to the south on the western edge of the lease block. ●

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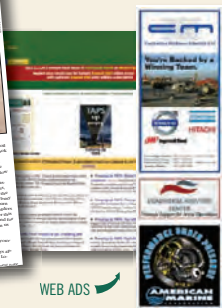
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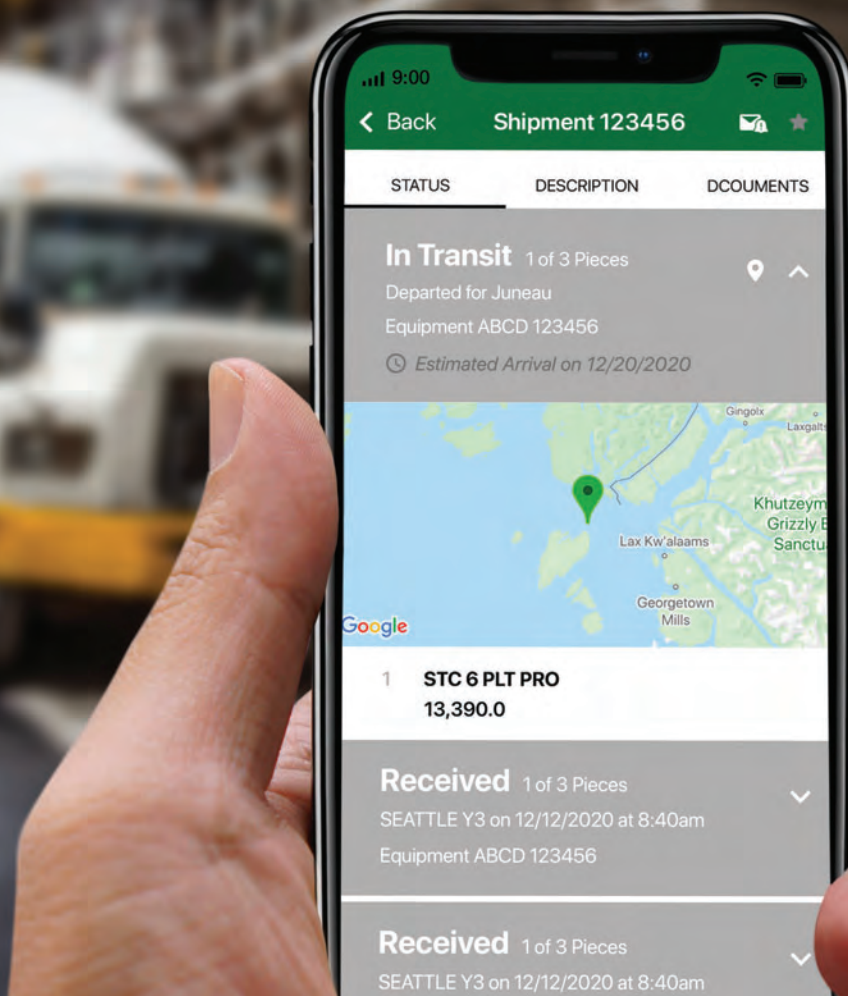
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