By ALAN BAILEY
Petroleum News

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**An added purpose**

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**F&W has sale questions**

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**L & D LEASING**

**LAND & LEASING**

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Brooks Range applies for injection order

Company plans water injection as the primary technique for enhanced oil recovery from the Mustang field on the North Slope

BY ALAN BAILEY
Petroleum News

Brooks Range Petroleum Corp. has applied to the Alaska Oil and Gas Conservation Commission for an area injection order that would authorize the injection of fluids into the Kuparuk oil pool in the Southern Miluveach unit, as part of the development of the Mustang oil field, on the North Slope.

Brooks Range plans to start up the Mustang field this year. According to the AOGCC application, fluids injected for reservoir pressure maintenance and enhanced oil recovery would primarily consist of seawater and produced water, but with gas also being injected. Waterflood would be the primary reservoir pressure maintenance and enhanced recovery technique. Brooks Range is constructing a pipeline to ship seawater for injection from the seawater system in the neighboring Kuparuk River field, operated by ConocoPhillips.

Kuparuk A and C sands

According to the application, the Kuparuk oil pool in the Southern Miluveach unit occupies a continuation of the Cretaceous age Kuparuk A and Kuparuk C sands from the adjacent Kuparuk River unit. Brooks Range anticipates the drilling of 10 horizontal production wells and up to 11 horizontal injection wells as part of the initial development of the Mustang field, the application says. Some production wells may be hydraulically fractured to improve production and ultimate oil recovery.

Most of the development wells will trend north-south, parallel to a pattern of geologic faults that intersect the reservoir. Horizontal sections of wells may be up to 6,000 feet in length, with production wells alternating with injection wells. Some further infill drilling may be needed to maximize recovery.

Modeling of the reservoir performance indicates that at some stage it may be necessary to follow water flooding with the use of gas or a mixture of gas and natural gas liquids, to further improve oil recovery, the application says. Gas would come from the Mustang field processing facilities.

Variable thickness

The application says that the Kuparuk oil pool lies in the A and C sands, within the depth interval 6,008 feet and 6,090 feet in the Tarn 1A well — the sands range in thickness from zero to 80 feet in the development area. The Kuparuk A sand consists of a relatively fine-grained shallow marine sandstone overlain by the coarser grained Kuparuk C sands. The

see INJECTION ORDER page 4
A program for advancing opportunities for new infrastructure development on the North Slope is nearing the end of its outreach phase, working with North Slope communities to identify potential infrastructure projects, Jeff Bruno, large project coordinator for the Alaska Department of Natural Resources Office of Project Management and Planning, told the Alaska House Resources Committee on April 26.

The program, called Arctic Strategic Transportation and Resources, or ASTAR, started in 2017, when the Legislature appropriated $7.3 million for the project, as a consequence of the amalgamation of several projects, at a time when significant planning activity was underway in the North Slope region, Bruno said.

The overall mission is to identify, evaluate and advance opportunities to use responsible infrastructure development to enhance the quality of life and economic opportunities for communities throughout the North Slope Borough, Bruno said.

Although beginning the transportation infrastructure is an obvious target of the work, Bruno commented that the evaluation method being developed and used could be employed elsewhere in Alaska.

"First and foremost, we want to develop a process where the foundation is really built on community values and inputs," Bruno said.

The ASTAR team is also considering resource development projects, identifying situations where there may be synergies between these projects and the projects identified by communities, Bruno said.

At this point, more than 250 potential projects have been identified and mapped, and the process of prioritizing the projects is beginning, he said.

The program also involves detailed computer-based terrain mapping. And, to assess the availability of construction materials, the ASTAR team has been locating and evaluating available data, including information about gravel sources, data from lake surveys and data from remote sensing surveys. The team is identifying data gaps with a view to potentially filling those gaps, particularly in areas where there are high priority projects.

Planning and analysis tool

And the program is developing a computer database that can capture all of the results of the planning efforts, including the mapping and the list of potential community and resource development projects. The database will become a tool to support data analysis and hence enable informed decisions over future infrastructure projects.

The final round of the program will involve taking the analysis tool and data to the communities, for verification. The tool will enable project evaluation, both from the perspective of an individual community, and on a more regional basis.

The team is mapping data from old seismic shot hole samples, noting where sand and gravel has been located in the subsurface. This summer’s fieldwork will involve drilling at locations where there appears to be good potential for finding more of these resources.

The resulting data will be fed into the ASTAR database, as well as being made available to the public through the regularly published DGGS publication process, Masterman said.

Finishing the funded program will involve completing the cumulative benefits analysis of the potential infrastructure projects and completing the database of information on construction resources. To date $1.4 million of the program’s $7.3 million budget has been spent, with a further $5.5 million committed to continuing program activities, Bruno said.

He said that he anticipates the program being completed around June of next year.

North Slope Borough perspective

Gordon Brower, director of planning and community services for the North Slope Borough, commented on the value that the borough sees in the ASTAR program. In general, there is a lack of connectivity between North Slope villages, and the costs of goods and services are very high, he said. A lack of support infrastructure limits opportunities for people in the region.

Moreover, projects of all types on the North Slope, not just oil and gas projects, require support infrastructure, Brower said. For example, in the past the lack of infrastructure has stymied efforts to develop the large quantities of high-quality, metallurgical coal known to exist in the region, he said. A major oil discovery at Smith Bay on the Beaufort Sea coast is isolated by a lack of transportation infrastructure.

By working together on the infrastructure issues, it will be possible to accomplish many things, Brower suggested.

Contact Alan Bailey at aballey@petroleumnews.com

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**ASTAR program completing its outreach**

DNR officials tell House Resources Committee about status of project for advancing infrastructure development on the North Slope

**EXPLORATION & PRODUCTION**

**NPR-A tundra overland travel closes**

The Bureau of Land Management’s Arctic District Office said winter overland tundra travel for the National Petroleum Reserve-Alaska closed effective 12:01 a.m., May 3.

The agency said snow and weather conditions in the NPR-A were no longer adequate for winter overland tundra travel.

The state closed the eastern and western coastal areas of state land on the North Slope for off-road tundra travel April 30, and said snow pack deterioration was widespread in coastal areas with large swaths of visible vegetation.

The state’s other two tundra travel areas, the lower and upper foothills, never opened for off-road travel this year.

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**PETROLEUM NEWS**
March ANS crude down 1% from February

Average of 522,334 bpd down 5% from March 2018; Cook Inlet, at 15,329 bpd, up 1.3% from down 1.7% from March 2018

By KRISTEN NELSON
Petroleum News

Akaska North Slope production averaged 522,334 barrels per day in March, 465,742 bpd of crude oil and 56,592 bpd of natural gas liquids, down 1%, 5,310 bpd, from a February average of 572,644 bpd, and down 5% from a March 2018 average of 549,874 bpd.

The drop in volumes comes from crude production, down 14.6%, 6,715 bpd, from February to March, while NGLs increased by 2.6%, up 1,405 bpd. From March 2018 to March 2019, ANS crude dropped 6.2%, while ANS NGLs increased by 6.2%.

Production data reported here comes from the Alaska Oil and Gas Conservation Commission, which provides volumes by field and well on a month-delay basis. The largest month-over-month volume decline was at the ConocoPhillips Alaska-operated Kuparuk River field, the Slope’s second largest, which averaged 104,830 bpd in March, down 2.6%, 2,752 bpd, from a February average of 107,582 bpd, and down 10.7% from a March 2018 average of 117,329 bpd.

In addition to the main Kuparuk pool, Kuparuk produces from satellites at Melwater, Tabasco and Tarn, and from West Sak.

The largest month-over-month percentage decline was at the Eni-operated Oooguruk field, which averaged 7,912 bpd in March, down 13.9%, 1,243 bpd, from a February average of 9,155, and down 33% from a March 2018 average of 11,815 bpd. Eni acquired Oooguruk from Cachus Alaska, subject to approvals, in January.

Other fields with declines Badami, operated by GlaciAir Oil & Gas subsidiary Savant, averaged 1,871 bpd in March down 0.3%, 6 bpd, from a February average of 1,883 bpd and up 161% from a March 2018 average of 696 bpd. Savant brought a new well, BI-07, online last May. That well produced 1,120 bpd in March, accounting for 62% of Badami production.

Production at the BP Exploration (Alaska)-operated Prudhoe Bay field, the Slope’s largest, averaged 273,766 bpd in March, down 0.6%, 1,541 bpd, from a February average of 275,307 bpd, and down 6.9% from a March 2018 average of 293,904 bpd. The field’s crude oil production, 220,977 bpd, was down 1.4%, 3,219 bpd, from February, while Prudhoe NGLs, which averaged 52,789 bpd, increased by 3.9%, 1,678 bpd.

In addition to the primary reservoir, production volumes from Prudhoe include Aurora, Borealis, Lisbon, Midnight Sun, Niaokak, Polaris, Point McIntyre, Put River, Raven and Schrader Bluff.

Milne Point, operated by Hilcorp Alaska, averaged 22,910 bpd in March, down 0.9%, 198 bpd, from a February average of 23,108 bpd, and up 6.9% from a March 2018 average of 21,425 bpd.

ConocoPhillips’ Great Mooses Tooth, which came online in early October, averaged 12,310 bpd in March, down 1.7%, 216 bpd, from a February average of 12,526. The field is in the National Petroleum Reserve-Alaska.

Production from the Hilcorp-operated Endicott field averaged 7,213 bpd in March, down 2.6% from a February average of 7,508 bpd, but up 2.1% from a March 2018 average of 7,165 bpd. March production included 6,443 bpd of crude oil and 870 bpd of NGLs.

Northstar, also operated by Hilcorp, averaged 11,133 bpd in March, down 3.6% from a February average of 11,553 bpd but up 16.3% from a March 2018 average of 9,757 bpd. March production included 8,200 bpd of crude oil and 2,933 bpd of NGLs.

Eni’s Nikaktung field averaged 16,527 bpd in March, down 4.2%, 717 bpd, from a February average of 17,244 and down 12.9% from a March 2018 average of 19,866 bpd.

Production up at two fields

Month-over-month production was up at two North Slope fields: ConocoPhillips’ Colville River and ExxonMobil Production’s Point Thomson.

Colville River production averaged 54,142 bpd in March, up 2.1%, 1,089 bpd, from a February average of 53,053 bpd, but down 16.5% from a March 2018 average of 64,847 bpd. In addition to oil from the main Alpine pool, Colville production includes satellite production from Fiond, Nanauq and Qanik.

At Point Thomson, March production averaged 9,674 bpd, up 10.1%, 980 bpd, from a February average of 8,784 bpd, and up 13% from a March 2018 average of 8,452 bpd. The field came online early 2016, with facilities geared to 10,000 bpd of condensate production, but there were issues with the facilities and the field only began regularly producing in the 10,000-bpd range at the end of last year.

Cook Inlet

Cook Inlet crude oil production averaged 15,329 bpd, up 1.3%, 195 bpd, from a February average of 15,134 bpd but down 1.7% from a March 2018 average of 15,597 bpd.

Hilcorp Alaska’s Beaver Creek field, see PRODUCTION DATA page 6 continued from page 2

INJECTION ORDER

Kuparuk A, with its fine grain size, is generally less permeable than the Kuparuk C. Both sands have porosities of around 22%.

The oil trap is formed by a major geologic structure called the Colville Anticline. Oil is sealed in the Kuparuk sands by the overlying Kaluhb shale, an extensive thick shale found in the region. Another impervious shale, the Milveuh, underlies the sands.

Although Brooks Range had originally planned to start up the Mustang field using permanent production facilities with a capacity of 15,000 barrels per day of oil, the vagaries of the oil price in recent years have caused the company to scale back the startup to the use of a small temporary facility, with production potentially ramping up to 6,000 bpd by the end of this year. Then, as revenue from the production comes in, the company anticipates scaling up the field towards a full development.

Brooks Range plans to start oil production at Mustang soon from a single well, the North Tarn 1A well. According to the company’s latest plans of operations, the company also plans to drill a lateral side-track from a partially completed well, the Mustang 1 well, and to complete the perforation and stimulation of the SMU M-02 well. Development will then proceed this year with the drilling of additional wells.

Following the initial use of the SMU M-02 for testing the performance of the well reservoir, this well will be converted to an injection well. Prior to the conversion of this well, any gas produced and not used as fuel gas for field facilities will be flared. Brooks Range has obtained an air quality permit from the Alaska Department of Environmental Conservation that allows the flaring of a certain amount of gas.

Presumably, as field development proceeds, water injection will begin. Maximum injection rates are estimated at 6,000 bpd of water and 6 million cubic feet per day of gas, the injection order application says.

Brooks Range will be the first small, independent operator to see an oil field through from discovery to production on the North Slope.
Hilcorp plans little work in gas fields

Plans of development for 4 Kenai Peninsula fields focused primarily on maintaining production; Ninilchik may see new wells next year

By KRISTEN NELSON
Petroleum News

Hilcorp Alaska produced some 193 million cubic feet per day of natural gas from Cook Inlet last year, 85% of the total of 228 million cubic feet per day produced from the Cook Inlet basin in 2018.

Four of its Kenai Peninsula gas fields — Cannery Loop, Deep Creek, Nikolaevsk and Ninilchik — account for just 22% of Hilcorp’s Cook Inlet gas production, and in plans of development submitted to the Alaska Department of Natural Resources’ Division of Oil and Gas on May 1, the company’s focus at the three smaller of those fields was on maintenance of production, with one new well planned at Cannery Loop, while at the largest, Ninilchik, the company indicated that new drilling would probably be put off at least a year.

All the plans are for Aug. 1, 2019, through July 31, 2020.

Cannery Loop

The POD for Cannery Loop is the 40th for that field.

In its 39th plan Hilcorp said it would continue to evaluate oil and gas reservoirs at Cannery Loop for long-term development but did not plan any long-range development during the 2018-19 plan period.

The company said it anticipated that production at Cannery Loop would likely remain steady, although a slight decline was possible.

Hilcorp said in the 40th POD it did maintain steady production at an average of 8 million cubic feet per day at the field during the 2018 calendar year.

For its 2019 plan, Hilcorp said it is evaluating drilling the CLU No. 14 in August, a well which would primarily target the Middle Beluga with secondary targets in the Sterling sands. Hilcorp said the well would “explore farther east in the Lower Beluga and Tyonek sands than any previously drilled well at CLU,” providing “more insight of the eastern flank of the Cannery Look structure,” information which might “lead to additional prospects to the north of the field.”

Deep Creek

This is the 16th POD for Deep Creek, which produced an average of 5.1 million cubic feet per day in 2018.

In the 15th plan Hilcorp said it planned to continue a stratigraphic test well program with two to four stratigraphic test wells, with an exploratory drilling program in 2019 based on results of the stratigraphic test wells and likely targeting the Sterling and Beluga formations.

Production from the Happy Valley participating area averaged 5.1 million cubic feet per day in 2018, the company said, with no production from Happy Valley tract operations. Hilcorp said there were no wells currently producing on a tract basis.

Hilcorp said it has completed evaluation on drilling a new HBV No. 18 well primarily targeting the Middle/Deep Tyonek sands with secondary targets in the Middle to Upper Beluga sands. The well was originally planned to be drilled in December, but is likely to be delayed, “due to bottlenecks in the KBPL gas pipeline.”

A new exploratory drilling program is still planned for 2020, based on results of stratigraphic test wells, and likely targeting the Sterling and Beluga formations.

Current production at Deep Creek will be “maintained and improved throughout the 2019 POD period, primarily through implementation of efficiencies and optimization projects,” the company said.

Nikolaevsk

Nikolaevsk is the smallest of the fields in this group of PODs, with production from a single well averaging 500,000 cubic feet per day in 2018. This is the 12th POD for the field.

Hilcorp said its plan for 2018 was maintenance of production from the Red Well No. 1. There were no development projects at Nikolaevsk in the 2018 POD period, the company said.

Hilcorp said in its 2019 POD that it did not have any planned exploration or delineation project at the field and plans to continue production from the Red Well No. 1.

Ninilchik

Ninilchik is the largest field in this group, averaging 27.9 million cubic feet per day in calendar year 2018. This is the 15th POD for the field.

In reviewing the previous plan, Hilcorp said it has identified six drilling prospects in the Grassim Osokoloff participating area but did not expect that those wells would be drilled under the 2018 plan unless market conditions changed.

The company said it planned to drill the Pearl No. 2A from a new pad on private land outside of the unit. The well, which would be drilled into the unit, is classified as a delineation well and the company said it anticipates that production from that well would necessitate reconfiguration of the Grassim Osokoloff participating area and additional drilling, which was deferred for other opportunities, the company said, and contingent on market conditions would most likely extend beyond the 2018 POD period.

Hilcorp said that based on market demand and conditions it would also consider sidetracking the existing Blossom exploratory well.

In its 2019 POD Hilcorp said that the six identified prospects in the Grassim Osokoloff PA will not likely be drilled in the 2019 POD period unless market conditions change but will most likely be drilled in the 2020 or 2021 POD periods.

Hilcorp said the Pearl No. 2A may be drilled in the late 2019 POD period, “contingent on market conditions, but will most likely extend beyond the 2019 POD period.”

The Blossom No. 1 may be sidetracked, based on market demand and economic conditions, but will most likely be drilled in the 2020 or 2021 POD periods.

March data from the Alaska Oil and Gas Conservation Commission show 26 producing wells at Ninilchik. Hilcorp said that during 2019 it would evaluate adding “velocity strings and/or other artificial lift options in various wellbores to enhance production.”

The company has a worker program planned during the 2019 POD for several wells and plans to install an additional high-pressure heater-separator unit at the Susan Dionne Pad to allow for additional throughput from the Paxton No. 8 wells. It may also install additional dehydration facilities on the Susan Dionne Pad to allow for additional throughput from Kalotsa Pad. It plans to add a water injection module at Susan Dionne Pad for produced water disposal.

By KRISTEN NELSON
Petroleum News

EXPLORATION & PRODUCTION

US drilling rig count drops 1 to 990

The number of rigs drilling for oil and natural gas in the U.S. dropped by one week ending May 3 to 990.

A year ago the count was 1,032 active rigs.

Houston oilfield services company Baker Hughes reported that 807 rigs targeted oil (up two from the previous week) and 183 targeted natural gas (down three).

The company said 71 of the U.S. holes were directional, 873 were horizontal and 46 were vertical.

The Alaska rig count was up three from the previous week. New Mexico was up two.

Colorado, Ohio and Oklahoma were each up one rig.

The rig counts in California, West Virginia and Wyoming were unchanged.

North Dakota and Pennsylvania were each down one rig.

Texas, the most active state with 454 rigs, was down seven from the previous week.

Baker Hughes shows Alaska with nine active rigs, compared to six a year ago.

The U.S. rig count peaked at 4,530 in 1981. It bottomed out in May 2016 at 404.
Cook Inlet’s smallest, averaged 341 bpd in March, down 1.3% from a February average of 346 bpd but up 255% from a March 2018 average of 96 bpd. Production at the field kicked up late last year after Hilcorp re-drilled a well at the field.

Hilcorp’s Granite Point field averaged 2,714 bpd in March, up 3.5% from a February average of 2,624 bpd, but down 7.7% from a March 2018 average of 2,942 bpd.

The BlueCrest-operated Hansen field, the Cosmopolitan project, averaged 1,562 bpd in March, up 11.9% from a February average of 1,396 bpd, and up 99.7% from a March 2018 average of 782. BlueCrest has been increasing the number of wells on production, most recently from four in February to five in March.

Hilcorp’s McArthur River field, Cook Inlet’s largest, averaged 4,903 bpd in March, up 1.9% from a February average of 4,810 bpd and up 4.7% from a March 2018 average of 4,681 bpd.

Hilcorp’s Middle Ground Shoal averaged 1,408 bpd in March, down 1% from a February average of 1,422 bpd, and down 8.8% from a March 2018 average of 1,544 bpd.

Redoubt Shoal, operated by Glacier Oil & Gas subsidiary Cook Inlet Energy, averaged 1,256 bpd in March, down 16% from a February average of 1,496 bpd, and down 4.4% from a March 2018 average of 1,314 bpd.

Hilcorp’s Swanson River field averaged 1,104 bpd in March, up 3.9% from a February average of 1,063, but down 22.6% from a March 2018 average of 1,427 bpd.

Hilcorp’s Trading Bay field averaged 1,462 bpd in March, up 13.6% from a February average of 1,287 bpd, but down 13.6% from a March 2018 average of 1,810 bpd.

Glacier’s West McArthur River field averaged 579 bpd in March, down 16.2% from a February average of 690 bpd and down 42.2% from a March 2018 average of 1,001 bpd.

ANS crude oil production peaked in 1988 at 2.1 million bpd; Cook Inlet crude oil production peaked in 1970 at more than 227,000 bpd.

ConocoPhillips said it planned to drill six to eight exploration and appraisal wells on Alaska’s North Slope toward the end of 2018 and in the first few months of 2019. Having recently discovered approximately 1 billion barrels of light, sweet oil west of the central Slope and into the National Petroleum Reserve-Alaska, the company said 75% of its prospective exploration acreage had yet to be drilled. Plans were to drill it in 2018-19 and from 2020 onward, along with the development of several discoveries. A new ultra-extended reach drilling rig, built by Doyon Drilling for ConocoPhillips, will be delivered in 2020, initially to assist with development of the Colville River unit’s Fiord West prospect on the environmentally sensitive Beaufort Sea coast, the oil major said in September 2018. The high-tech rig will allow access to 154 square miles of subsurface from a 14-acre drilling pad.

“In 2020 we’re bringing in the largest mobile extended reach drilling rig in North America and maybe the biggest in the world,” ConocoPhillips COO Matt Fox said in a mid-March 2019 interview with Bloomberg anchor Alix Steel on Commodity in Chief, a program dedicated to the biggest names and news in the commodity world.

With its new drill rig ConocoPhillips will be able to “drill wells six to eight miles away from pads, minimizing the environmental imprint,” Fox said.

**MAY 31, 2019**

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**Contact Kristen Nelson**

at knelson@petroleumnews.com
At Willow, the largest new discovery to date, ConocoPhillips hopes to build a new standalone production facility which will be able to handle as much as 100,000 barrels of oil per day, the company has said, but Fox said they are “unsure,” and still trying to determine just how much oil can be produced from the area, mentioning volumes of 100,000 and 140,000 bpd during the interview.

Fox was quick to point out that the 1 billion barrels of newly discovered “light, sweet” crude was “100% oil” and not oil equivalent, noting the wells all had a “high oily content,” and contained very little natural gas. The gas that was found in the wells, he said, was reinjected. (In 2018 ConocoPhillips said crude oil from Willow area wells had an API viscosity in the range of 41-44 degrees.)

When asked whether ConocoPhillips was bringing the hydraulic fracturing and well technology it employed in tight oil plays in the Permian basin, Eagle Ford and Bakken to Alaska, Fox said not really, pointing out they were deal ing with “conventional reservoirs” on the North Slope that did not require the “massive hydraulic fracturing we use in the Lower 48.”

The North Slope wells were horizontals, he said, but their “true” permeability was high enough to flow without “massive stimulation.” The wells, he noted, would be fracked, but not to the extent of horizontals in unconventional reservoirs in the Lower 48.

Fox noted that drilling was only “40%” to “45%” complete on the North Slope that did not require the “massive hydraulic fracturing we use in the Lower 48.”

Alaska gets larger cut of capex

Near the end of 2018, ConocoPhillips said it would increase its capital expenditure, compared with a capex range of 41-44 degrees.)

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Alaska gets larger cut of capex

Near the end of 2018, ConocoPhillips said it would increase its capital expenditure to Alaska to around $1.2 billion for 2019. This figure, amounting to about 20% of the company’s planned worldwide expenditure, compared with a capex level of approximately $900 million in 2018 in Alaska, excluding acquisition costs.

ConocoPhillips expected its 2019 worldwide capex to be about $6.1 billion, close to the same level as in 2018. So, the announced boost to Alaska investment represented an increased share of the company’s global expenditure, a factor that company officials have said reflected ConocoPhillips’ confidence in its Alaska ventures.

The increase in expenditure came from costs related to the advancement of Greater Mooses Tooth 2, or GMT-2; higher activity levels and higher working interests in existing fields; and further exploration activity on the North Slope, the company said.

The reference to higher working interests in Alaska referred to the acquisition of Anadarko Petroleum’s interests in lease holdings, mainly west of the central North Slope into NPR-A, and the acquisition of BP’s interests in the Kuparuk River field and Kuparuk pipeline system.

ConocoPhillips’ enlarged working interests in these assets will increase the company’s share of capital expenditure.

Big spend for Willow

Company officials have indicated initial development of Willow would likely cost $2 billion to $3 billion, with an additional $2 billion to $3 billion required for full field development, which will include not only the processing facility but gravel roads, pipelines, up to five drill pads and associated infrastructure.

The behemoth at the western end of the current chain of ConocoPhillips’ NPR-A developments, Willow is in the Bear Tooth unit and alone expected to peak at a rate of 100,000 bpd, with first production anticipated around 2024-25, if the project goes ahead as anticipated.

Initially, the company was looking to send Willow oil to be processed at its Alpine facilities in the Colville River unit to the east, then through the Kuparuk pipeline system and on to the trans-Alaska oil pipeline for the 800-mile journey south to its terminus in the Port of Valdez. But after reassessment of seismic and drilling results, in mid-2018 ConocoPhillips increased the project’s resource estimate from 300 million barrels of recoverable oil to between 400 million and 750 million barrels.

Multiple wells

The drilling results incorporated into the company’s plans for Willow’s development and standalone processing facility in 2018 were partly based the three-ring exploration and appraisal drilling in the winter season of 2017-18, the largest program conducted by ConocoPhillips on the North Slope since 2002.

Using the Doyon 141 rig, the company said four “exploration and appraisal” wells were drilled in and near Willow. Timmaq 7 (T7), T8, T9 and West Willow 1 (WW1), involving more than 37 miles of ice road and five ice pads.

Using the Kuskupik 5 rig, one slant and vertical well was drilled and tested at the Putu prospect, Putu 2 (PT2) and P2A, directly south of the Colville River unit. The program, on ASRC and state subsurface and Kuskupik surface acreage, involved one mile of ice road and an ice pad.

At the Stony Hill prospect, directly south of PT2, Stony Hill 1 (SH1), a vertical exploration well was drilled with the Arctic Fox rig. Seventeen miles of ice road and one ice pad were laid. The well was tested.

see EXPLORERS PREVIEW page 8

The reference to higher working interests in Alaska referred to the acquisition of Anadarko Petroleum’s interests in lease holdings, mainly west of the central North Slope into NPR-A, and the acquisition of BP’s interests in the Kuparuk River field and Kuparuk pipeline system.

ConocoPhillips’ enlarged working interests in these assets will increase the company’s share of capital expenditure.

Big spend for Willow

Company officials have indicated initial development of Willow would likely cost $2 billion to $3 billion, with an additional $2 billion to $3 billion required for full field development, which will include not only the processing facility but gravel roads, pipelines, up to five drill pads and associated infrastructure.

The behemoth at the western end of the current chain of ConocoPhillips’ NPR-A developments, Willow is in the Bear Tooth unit and alone expected to peak at a rate of 100,000 bpd, with first production anticipated around 2024-25, if the project goes ahead as anticipated.

Initially, the company was looking to send Willow oil to be processed at its Alpine facilities in the Colville River unit to the east, then through the Kuparuk pipeline system and on to the trans-Alaska oil pipeline for the 800-mile journey south to its terminus in the Port of Valdez. But after reassessment of seismic and drilling results, in mid-2018 ConocoPhillips increased the project’s resource estimate from 300 million barrels of recoverable oil to between 400 million and 750 million barrels.

Multiple wells

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On time and on budget.
ConocoPhillips was advancing construction plans in early 2019, Ryan Lance, chairman and CEO, said 2018 earnings strategy.

A third anomaly in the Putu prospect, he said, immediately west of the two tested anomalies — the company planned to drill into this third anomaly from the existing CD-4 pad in the Colville River unit before its 2018-19 ice road campaign began.

In a presentation about the company’s 2018 earnings strategy in early 2019, Ryan Lance, chairman and CEO, said ConocoPhillips was advancing construction plans in early 2019, Ryan Lance, chairman and CEO, said 2018 earnings strategy.

He said the company had already drilled two wells in December 2018 from existing gravel pads, testing the Cairn prospect from Drill site 2S, or DS-2S, in the southwestern corner of the Kuparuk River unit, and testing the seismic anomaly in the Putu prospect in a well drilled from CD-4.

The Putu prospect was in what ConocoPhillips dubbed the Narwhal trend (informal, not geologic term), the same trend as the Pâka Honeshke discoveries, in which Oil Search and its partners Repsol and Armstrong Energy are exploring and developing in the prolific Nanushuk formation.

ConocoPhillips said very little over the years about the Cairn prospect. In the southwestern corner of the Kuparuk River unit, Cairn was part of the Tarn oil pool, which predecessor ARCO discovered with the Bermuda No. 1 well in 1991. That well had five intervals of late Cretaceous-aged marine sandstone in the Seabee formation — from deepest to shallowest, the intervals were Iceberg, Arête, Cairn, Bermuda and C30.

Perforated in the Bermuda, the discovery well flowed at 1,900 barrels of oil equivalent per day after fracturing and produced 37-degree API gravity oil.

The Cairn interval was also present in the nearby Meltwater North No. 1 exploration well drilled into the middle Cretaceous Seabee formation Bermuda/Cairn sands, the stratigraphic equivalent of Tarn.

Meltwater went online in 2000. ConocoPhillips and its predecessor companies, Phillips and ARCO, have talked about the Cairn gas accumulation for enhanced oil recovery within the Kuparuk unit. Government filings by the company described the Cairn interval as thinner than the Meltwater oil interval produced at Meltwater, noting the sandstone reservoirs were discrete from but analogous to the Tarn reservoir some 10 miles to the north.

In 2001 the company penetrated oil in the Cairn interval at the Tarn No. 4 exploratory well, but said the permeability was too low for economic development. Seismic data (3-D) shot a couple of years later suggested “a prospective channel feature in the Cairn interval existed in the Meltwater development area (and) may have improved reservoir quality” compared to the interval in the Tarn No. 4 well.

Most recently, in its application for the 2018 Kuparuk plan of development with Alaska’s Division of Oil and Gas, ConocoPhillips mentioned the 2N-310 Cairn test in 2008: “The Cairn interval was tested while drilling a Tarn reservoir development well (an injector). Both gas and oil was discovered in the Cairn interval and, additional appraisal will be required to determine the Cairn development potential in this area.”

But the company said, “no further exploration/delineation is planned in the Cairn or Bermuda sand intervals at this time.”

That has obviously changed for the Cairn.

Seven total exploratory wells

Seven total exploratory wells

The other promised four to six exploration wells making up the 2018-19 season were drilled using Doyon rigs 141 and 142. As of April 7, 2019, Rig 141 was on the West Willow 2 well and Rig 142 was on the Timnaq 13, both exploratory wells.

As of the same date, the Alaska Oil and Gas Conservation Commission, which among other things issues and tracks drilling permits, showed ConocoPhillips having completed three other exploration wells west of the central North Slope, including: Timnaq 10, completed March 4, 2019 (total depth 7,635 feet and true vertical depth 4,052 feet); Timnaq 15, completed Feb. 21, 2019 (total depth 7,635 feet and true vertical depth 4,052); and Timnaq 16, completed March 7 (total depth 3,950 feet and true vertical depth 3,950). So it appeared the company would complete five exploration wells from off-road ice pads, plus the two wells it had completed from gravel pads DS-2S and CD-4, for a total of seven wells — all classified as exploratory by AOGCC, and ConocoPhillips referred to them as a mixture of exploration and appraisal wells.

Petroleum News • Week of May 12, 2019


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EIA oil price forecast up $5 per barrel

By KRISTEN NELSON
Petroleum News

The Brent crude oil spot price averaged $71 per barrel in April, the U.S. Energy Information Administration said May 1, an increase of $5 from March and just below the April 2018 price, and the agency has increased its forecast for the annual average for both this year and next.

“In the May Short-Term Energy Outlook, EIA increased its forecast for average Brent spot prices in 2019 and 2020 by about $5 per barrel,” EIA Administrator Dr. Linda Capuano said in a statement on the May STEO release. “The increase accounts for near-term tightness in oil markets and increasing supply disruption risks in several oil-producing companies.”

EIA is now forecasting an average of $70 per barrel this year and $67 in 2020, both about $5 per barrel higher than the April forecast, attributed to both increasing supply disruption and tighter expected global oil market balances.

The 2018 Brent average was $71 per barrel.

April saw the fourth consecutive month-by-month increase in crude prices, which were approaching six-month highs near the end of the month, EIA said. Supply risk was heightened April 22, when the U.S. notified eight countries which had sanction waivers to import Iranian crude and condensate that those waivers would not be extended past their May 2 expiration.

EIA said it expects increased production from Saudi Arabia, the United Arab Emirates, Kuwait and Russia “to largely backfill the lower Iranian production, though these countries will likely wait until their June meeting to make any decisions regarding production increases.”

Higher prices also reflect increased geopolitical risk, the agency said, noting that unrest within Venezuela “contributes to a highly uncertain situation that could immediately disrupt the remaining oil production there.” Even if there are no additional disruptions in Venezuela, EIA said it forecasts that country’s production will continue to see significant declines through 2020.

“EIA expects some tightness in global oil markets during the second and third quarters of 2019, but anticipates that growing production in the United States and key OPEC countries will ensure that global supplies continue to meet demand moving forward,” Capuano said.

The agency said recent oil price increases and expected higher prices through 2020 are expected to contribute to increased drilling in the U.S., with the expected U.S. crude oil production forecast up 300,000 bpd from April and expected to average 13.4 million bpd in 2020. EIA said the higher 2020 production “is the result of higher forecast prices in 2019 that have a lagged effect on production.”

Crude oil production in the Organization of the Petroleum Exporting Countries is expected to average 38.3 million bpd this year, down 1.7 million bpd from 2018. EIA said it expects OPEC production to fall by 400,000 bpd to an average of 29.8 million bpd in 2020, with Venezuela and Iran accounting for most of the OPEC output declines, which EIA expects to be partially offset by other OPEC members.

Global oil demand is expected to outpace supply this year, but in 2020, global liquid fuels supply is forecast to rise 1.9 million bpd, with 1.5 million bpd coming from the U.S.

“EIA continues to forecast that U.S. dry natural gas production will reach new records in 2019 and 2020. The forecast indicates that this year will mark the first time U.S. production will exceed an average of 90 billion cubic feet per day,” Capuano said.

The Henry Hub natural gas spot price averaged $2.64 per million British thermal units in April, EIA said, down 31 cents from March, with prices falling due to warmer-than-normal temperatures across much of the U.S.

Strong growth in U.S. natural gas production is expected to put downward pressure on prices in 2019 and 2020, the agency said, with Henry Hub spot prices expected to average $2.79 per million Btu this year, down 36 cents from 2018, and to average $2.78 in 2020.

The forecast of 90.3 billion cubic feet per day this year would be an increase of 6.9 bcf from 2018, with production expected to grow to an average of 92.2 bcf per day in 2020.

EIA said April 2019 was the second-warmest April in 23 years and it estimates that the relatively warm temperatures, “combined with ongoing increases in natural gas production, contributed to the largest injection of natural gas into U.S. working storage in April based on historical data going back to 1976.”

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AOGCC OKs disposal ops extension at Aspen

The Alaska Oil and Gas Conservation Commission has approved a limited extension of commercial disposal operations at the Aspen No. 1 well, as the operator, Plugging Inlet LLC, continues plugging and abandonment work on a group of Cook Inlet wells requiring P&A after the Aurora bankruptcy.

In a May 1 order the commission said Plugging Inlet had requested an extension of a previously issued and now expired order which authorized limited duration, commercial disposal, water only injection in the Aspen No. 1 well. The current approval is through Oct. 1, 2019, or when Aspen 1 is plugged and abandoned or when the operator for Bernick Energy-operated wells associated with the Aurora bankruptcy.

In December, the commission said it approved an extension to Oct. 1, 2019, to plug and abandon Plugging Inlet operated wells associated with the Aurora bankruptcy.

Wastes authorized include those from pre-bankruptcy Aurora wells Three Mile Creek 1, 2 and 3 — now operated by Cook Inlet Energy. The commission said Nicolai Creek wastes and tank 129 contents have already been disposed of into Aspen 1 and no ongoing Nicolai Creek wastes are permitted. Nicolai Creek is operated by Amaroq.

In the afternoon there will be presentations of rock cores in the GMC collection, including cores from the Nanushuk formation at Umiat, and from wells in the National Petroleum Reserve-Alaska. There will also be an opportunity to tour the GMC, which holds a massive collection of rock samples and other geologic material, mostly acquired in conjunction with resource development in the state.

Further information is available from the GMC.

—ALAN BAILEY

Investigative technologies for Alaska geology

On May 31, in conjunction with the 2019 Alaska Oil and Gas Association Conference, the state Geologic Materials Center and the Alaska Geological Society are holding a technical breakout session in the GMC in Anchorage. The focus of the session will be the potential for new investigative technologies and machine learning systems to better assist geologists and resource companies to meet the challenges of interpreting Alaska geology.

In the morning, starting at 9:30 a.m., there will be a series of talks covering a range of topics, from the use of newly available 3-D seismic data for a better understanding of Nanushuk-Torok oil reservoirs, to the use of machine learning from shallow soil samples in the prediction of potential providers. Topics also include the automated scanning of fine-scale rock properties and the automated logging of rock properties in the Nanushuk.

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Further information is available from the GMC.

—KRISTEN NELSON
Wolfpack Land Company is Offering 4,761 Acres of Prime Mineral Interest Ownership in the Kenai, Alaska Area for Oil and Gas Leasing

Beaver Loop Road Area

Township 5 North, Range 11 West (Surveyed)
Section 1, Lots 6-8, 10, 14, S1/2NE1/4, N1/2SE1/4, NE1/4SW1/4;
Section 2, Lots 3 and 6, S1/2NW1/4.
Section 11, Lots 1, 8, 9, W1/2NE1/4, NW1/4SE1/4, NE1/4SW1/4;
Section 12, Lots 1-13, NE1/4SW1/4, SE1/4NE1/4, NW1/4SE1/4.
Containing 1,063.51 acres, more or less.

Township 6 North, Range 9 West (Surveyed)
Section 35, NE1/4NE1/4, N1/2S1/2NE1/4, N1/2S1/2SE1/4, SE1/4NW1/4, E1/2SW1/4,
E1/2SW1/4SE1/4, W1/2SW1/4SW1/4, SE1/4SW1/4,
S1/2SE1/4, S1/2SNW1/4/2SE1/4, S1/2SNW1/4SE1/4.
Section 36, All
Containing 1,105 acres, more or less.

Aggregating 3,116.49 acres, more or less.

Robinson Loop Road Area

Township 5 North, Range 9 West (Surveyed)
Section 6, Lots 2, 3, 5-7, SW1/4NE1/4, E1/2SW1/4, SE1/4;
Section 7, Lots 1, 2, E1/2NW1/4, NE1/4, NE1/4SE1/4;
Section 8, W1/2NW1/4, NW1/4SW1/4.
Containing 926.23 acres, more or less.

Township 5 North, Range 10 West (surveyed)
 Section 1, Lots 1, 2, S1/2NE1/4, SE1/4;
 Section 12, E1/2, E1/2NW1/4.
Containing 718.96 acres, more or less.

Aggregating 1,645.19 acres, more or less.

These fee mineral rights have significant known hydrocarbons on or very near them. This prospect is not in a remote area. Everything is road accessible, winter and summer, with easy access to oilfield suppliers. Seismic data available.

Terms: $3,000/acre, 25% royalty.

For more details contact Wolfpack Land Company, Houston, Texas, at jim5thgn@outlook.com, jim@applecapital.net, or (907) 394-9148.
Department of Interior, has been assigned the task of managing and organizing a lease sale program for the coastal plain and, ultimately, the task of overseeing any oil and gas activities that result from a lease sale. Fish and Wildlife, another agency within Interior, manages environmental conservation in the refuge and has been participating in the EIS development.

By contrast, the National Petroleum Reserve-Alaska, at the western end of the North Slope, is not a wildlife refuge and is entirely managed by BLM.

In its comment filing Fish and Wildlife said that it is required to manage ANWR in a manner consistent with all purposes of the refuge, including the need for fish and wildlife conservation, the need to meet the obligations of international treaties relating to natural habitats, and the need to support subsistence use by local communities, in addition to accommodating the new oil and gas program.

Alternative D2

The agency said that alternative D2 includes recommendations that the agency had made during the preparation of the draft EIS. The alternative would help maintain the quality of the rivers in the refuge and is the most consistent of the alternatives with regard to the Endangered Species Act and the Marine Mammal Protection Act, the agency said.

In order to protect biological and ecological resources, alternative D2 would place some of the coastal plain off the area open to oil and gas leasing—over 1 million acres of the 1.5 million acres of the 1002 area would be offered. And, to mitigate impacts on caribou summer habitat, the alternative would place timing restrictions on oil and gas operations in 204,700 acres. Surface operations would be banned on 706,600 acres. Restrictions on surface use would apply to 123,900 acres. And activities in all parts of the area would require specific approvals, rather than be subject to standard terms and conditions.

In its filing, Fish and Wildlife asked for more explicit recognition of its role as the land and surface estate manager for ANWR, with a recommendation that BLM should be required to consult with Fish and Wildlife regarding any oil and gas activities that impact surface resources. The agency said that the assessment was as much as any aspect with regard to the EIS.

He wrote that his government “wants to cooperate with B.C. and other provinces whenever we can. But we will never be afraid to stand up for Alberta when we must... we are showing that we are serious about protecting Canada’s vital economic interests.”

Even though Kenney’s “posturing” and “hammer out a plan for a path forward” approach may seem to the public to be a protective stance against the potential impacts of the changing Arctic environment, including the effect of the melting of the permafrost and ice wedge degradation on infrastructure in the region.

Spill response plans

More specific stipulations for required oil spill prevention and response plans are needed, including requirements for the availability of adequate spill response capacity in a timely manner.

Other issues that Fish and Wildlife has been participating in the EIS development include the need to support subsistence use by local communities, in addition to accommodating the new oil and gas program.

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Northern Solutions receives ConocoPhillips award

Northern Solutions LLC recently announced that it is a recipient of the 2018 ConocoPhillips Supplier Recognition Award program in the category of doing business better. Only four such awards are given globally each year.

Northern Solutions was presented the award at its Anchorage location on April 16 by Joe Marchak, president of ConocoPhillips Alaska.

Northern Solutions provided engineered, tested and manufactured tools to ConocoPhillips specifications, reducing time and risk in coiled tubing drilling rig operations and providing a safer exit technique. Northern thus contributed to reducing overall cost of supply for Alaska North Slope crude.

"As a born and bred Alaskan company it’s a privilege to earn this distinction," said Candice English, owner and CEO of Northern Solutions. "Accomplishing projects on time and within budget is why we’re still in business after 13 years.

Ten companies are honored annually for exhibiting exceptional leadership in observance of ConocoPhillips’s SPIRIT values. Awards are given in two areas: focus on execution and doing business better.

ConocoPhillips business units around the world generated nominations internally, with winners chosen by a cross-functional committee of senior managers.


Lynden Air Cargo expands service in Western Alaska

Lynden Air Cargo said April 23 that it is expanding its scheduled service points in Alaska to include St. Mary’s and Emmonak.

Beginning April 30, Lynden will offer year-round scheduled air freight service on Tuesdays and Fridays to better serve customers and to support local industries in the Western Alaska region.

We have traditionally served these areas with charter service to support seasonal fishing operations, but we are now proud to offer regular and reliable air traffic service all year,” said Lynden Air Cargo President Rick Zerkel. "Lynden Air Cargo has been delivering freight in Alaska for many years, and we know the challenges and terrain. We handle oversized loads and small packages alike with our scheduled service and flag stops to points in the Alaskan Bush. We can arrange the right flight to get cargo delivered to practically any village or city in the state. Lynden Air Cargo’s scheduled service to St. Mary’s and Emmonak will begin and end in Anchorage. In addition to fish and general cargo, Lynden will carry bypass mail in and out of the two areas in its commercial C-130 aircraft.

Lynden Air Cargo also offers scheduled year-round service from Anchorage to Bethel, Nome and Kotzebue and flag stop service to other remote points in Alaska. Flights to Bethel are scheduled Tuesday through Saturday and to Nome and Kotzebue on Tuesdays, Thursdays and Saturdays. For more information on these services visit www.lynden.com/laac, or call 907-243-7248.

Alaska West Express named safest truck fleet for 2018

Alaska West Express said April 30 that it received the 2018 Alaska Safe Truck Fleet of the Year Award from the Alaska Trucking Association at the association’s annual meeting in April. Alaska West Express also received the award in 2016, 2014 and 2013.

The carrier was recognized for its safety performance in 2018, including accident frequency rates, compliance, safety and accountably scores, and OSHA recordable injuries.

The ATA sponsors this prestigious safety award with ConocoPhillips to recognize and reward carriers who operate safely on the highway and in the workplace. CSA is a major safety measurement and reporting initiative of the Federal Motor Carrier Safety Administration.

This award demonstrates the dedication and hard work of our entire team of transportation professionals," said Alaska West Express President Eric Badger. "Our drivers, maintenance personnel, operators, dispatchers, supervisors, managers and administrators all share in this success. Their efforts to continually identify safety improvements in our extremely challenging conditions is the cornerstone of our program. The safety of our people, the environment and our equipment is our most important objective each day."

"Alaska West Express clearly demonstrates to themselves, their management and the general public that the trucking industry can and does operate safely. Safety is our number one priority. ATA is proud that Alaska West Express is a member," said Aves Thompson, executive director of the Alaska Trucking Association.

Editor’s note: Some of these news items will appear in the next Arctic Oil & Gas Directory, a full color magazine that serves as a marketing tool for Petroleum News’ contracted advertisers. The next edition will be released in September.

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KUPARUK WELLS

ConocoPhillips said that an 11-well coiled tubing drilling program in 2018 generated a peak incremental oil rate of some 3,300 bpd. Six West Sak wells were also drilled in 2018. A non-rig wellwork program including slickline, electric line and service coiled tubing jobs added some 11,500 bpd on average for the year. As miscible injection continued in 2018 with natural gas liquids from the Greater Kuparuk Area at five drill sites.

2019 Kuparuk plan

The drilling program in the 2019 POD includes five grassroots rotary wells in the Kuparuk PA and some 20 CTD wells; no additional drill sites to access Kuparuk A and C sands are planned during this POD period. For enhanced recovery, imports of NGLs from Prudhoe Bay recommended in September, increasing the availability of NGLs for blending with gas for miscible injection, allowing for an expanded EOR program. Drill sites 1B, 1C, 1D, 1E and 2C have been previously targeted and will continue to receive MI, the company said. Drill sites at Central Professing Facility 2 will become additional targets. In 2018, ConocoPhillips said Kuparuk received an average of 64 million cubic feet per day of MI injection, with an oil rate from EOR estimated at some 9,600 bpd. West Sak wells were also received from Prudhoe until 2022 and until the cessation of those imports the primary expected gas injection fluid for the majority of Kuparuk is MI, with a long-term plan of following that with a lean gel injection. The injection of lean gel following the ramp down of MI will allow for recovery of a portion of NGLs trapped as part of the EOR process and maintenance of liquid rates in high water cut producers as gas cycles through the reservoir from injectors to producers. ConocoPhillips said handling limits with gas lift compressors will continue to constrain GKA production.

RAILBELT LETTER

RAILBELT grid issue, the RCA is also expressing concerns that an initiative by Chugach Electric Association, Municipal Light & Power and Mountain Energy Authority to institute a protocol known as merit ordered economic dispatch came to an abrupt halt in October 2018, because of complications arising from the proposed purchase of ML&P by Chugach Electric Association and economic dispatch is that utilities will make continuous use of the cheapest available power generation across the electrical grid — the three Southcentral utilities had identified the possibility of more than $16 million in potential cost savings from this type of power pooling arrangement. Having had since 2015 to proceed with voluntary efforts, the RCA has expressed concern for the commission to work with the Legislature to develop actions that will institutionalize merit ordered dispatch, Commissioner Robert Pickett said during the May meeting.

The one hand the utilities have demonstrated a willingness to work together and have made significant progress on several efforts that have thus far failed to result in any institutional reforms. The overall intent is to minimize the cost of electricity for consumers, while maintaining an acceptable level of system reliability. The idea also is to facilitate access to the grid for indigenous independent power producers. One particular concern is that an initiative by Chugach Electric Association, Municipal Light & Power and Mountain Energy Authority to institute a protocol known as merit ordered economic dispatch came to an abrupt halt in October 2018, because of complications arising from the proposed purchase of ML&P by Chugach Electric Association and economic dispatch is that utilities will make continuous use of the cheapest available power generation across the electrical grid — the three Southcentral utilities had identified the possibility of more than $16 million in potential cost savings from this type of power pooling arrangement. Having had since 2015 to proceed with voluntary efforts, the RCA has expressed concern for the commission to work with the Legislature to develop actions that will institutionalize merit ordered dispatch, Commissioner Robert Pickett said during the May meeting.

The other component of grid unification that the RCA recommended in 2015 is the formation of a transmission company to operate the transmission grid. A so-called transco could simplify and improve the economics of using the transmission system by introducing a single transmission rate; implementing non-discriminatory grid access; and providing a mechanism for the funding of grid upgrades.

Some of the most important ones are:

- **Northwest**:
  - The 3S-611 Well is currently being tested at Kuparuk to evaluate for productivity and waterflood performance. The 3S-611 and 3S-612 wells, a producer-injector pair, were drilled late last year and are “providing reservoir performance data in addition to the original pilot wells drilled in 2015.”
  - The 3S-611 and 3S-612 wells are planned “to further de-risk waterflood performance.”
  - Coupled with results from special core analyses, this dynamic oil data will be used for the Morris model.
  - The Morris model is a new, dynamic model that will allow ConocoPhillips to make adjustments to the injection rates of wells and reservoirs to optimize oil recovery.

- **Multwater, Tanacross, Turn**
  - The Mw-6/14-2 well was brought online in April. It had been shut-in since 2015 due to an increase in submersible pump problems. ConocoPhillips said it is working through ESP troubleshooting to determine if higher oil production rates can be achieved.
  - The Multwater field is being developed from the DS-2P, the most southernly portion of Kuparuk. There were 16 active wells in 2018, 10 producers and six injectors, with an average oil production rate of 700 bpd. The field was returned to MI in November after the resumption of MI imports. ConocoPhillips said MI is expected to last until this summer, “at which point the injection line will be fully converted to water injection, which is the service expected for the remainder of the field life.”

- **West Sak, NEWS**
  - West Sak is developed from eight drill sites. In 2018 the company had 123 active producers and 67 injectors. Average West Sak PA and NEWSPA combined production was 22,700 bpd.
  - The NEWS development project was completed in 2017 and 2018, including expansion of existing DS-1H, drilling of four multilateral production wells, 11 vertical/slate injection wells and recompletion of an existing well into injectors.
  - During 2019, the company said, West Sak operations will focus on the 3R drilling program where the plan is to expand the drill site to accommodate nine new wells, a project which would include formation of the West Sak PA, incorporating the 3R development wells that have been producing under tracts operations.
  - The new drill sites are possible for West Sak and NEWS.

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**Response:**

The Alaska House of Representatives has introduced a bill to the Legislature. Pickett said that ensuring the implementation of an appropriately regulated electrical reliability organization is essential to maintaining a secure and reliable electric system to the Legislature. Meanwhile the commission will use its existing authority to enforce the consensus standards that have been established.

The other component of grid unification that the RCA recommended in 2015 is the formation of a transmission company to operate the transmission grid. A so-called transco could simplify and improve the economics of using the transmission system by introducing a single transmission rate; implementing non-discriminatory grid access; and providing a mechanism for the funding of grid upgrades.

After some initial optimism in 2015, there was a succession of announcements and delays over the years regarding transco formation. Ultimately, in February of this year the Alaska Railbelt Transmission LLC, or ART, an electricity transmission company for the Railbelt grid, applied to the commission for a certificate of public convenience and necessity on the results from other various development opportunities the company is currently exploring.
On trend with Willow

Dubbed Project Peregrine, Entek’s acreage stretches between the Umiat oil field on the south “on trend” with ConocoPhillips’ Willow oil prospect to the north, Ferguson told Petroleum News in a May 7 interview.

ConocoPhillips has largely focused its exploration and appraisal budgets in 2018 and 2019 on Willow, its largest new discovery to the west of the Colville River in NPR-A. The company is planning a stand-alone production facility for the field, expecting to bring it online in 2024-25 at 100,000-140,000 barrels a day.

In a mid-March 2019 interview with Bloomberg anchor Alix Steel on Commodity in Chief, ConocoPhillips CEO Matt Fox said the 1 billion barrels of newly discovered “light, sweet” crude in the area was “100 percent oil” and not oil equivalent, noting the wells all had “a high oily content,” and contained very little natural gas.

The gas that was found in the wells, he said, was reinjected. (In 2018 ConocoPhillips said crude oil from Willow area wells had an API viscosity in the range of 41-44 degrees.)

Biggest clinothem in the world

In recent years several large oil discoveries have been made in the Brookian Nanushuk and Torok formations west of the central North Slope, the youngest of the major petroleum bearing rock sequences in the region.

Essentially, the sediments in the Nanushuk and Torok were laid down in what geologists term a clinothem, a system of sedimentary deposits that build out from land into a marine basin. But according to state and federal geologists this particular clinothem is the largest of its type found anywhere in the world, containing more than 1 million cubic kilometers of sediment and having a vertical relief of at least 2 kilometers. The sediments were deposited in a basin on the north side of the then-emerging Brooks Range.

A recent oil and gas assessment of NPR-A west of the Colville River where Entek has its leases dramatically boosted technically recoverable undiscovered oil reserves in the area. Conducted by the U.S. Geological Survey and based only on a re-evaluation of the resource potential of the Nanushuk and Torok, USGS increased potential undiscovered NPR-A oil reserves from a few hundred thousand barrels in 2010 to 1.7-21.8 billion barrels in late 2017, with a mean estimate of 8.8 billion barrels.

Contrast in carbon pricing initiatives across Canada

In a mid-March 2019 interview with Bloomberg anchor Alix Steel on Commodity in Chief, ConocoPhillips CEO Matt Fox said the 1 billion barrels of newly discovered “light, sweet” crude in the area was “100 percent oil” and not oil equivalent, noting the wells all had “a high oily content,” and contained very little natural gas. The gas that was found in the wells, he said, was reinjected. (In 2018 ConocoPhillips said crude oil from Willow area wells had an API viscosity in the range of 41-44 degrees.)

QUEBEC has yet to take its own stand, but if it sides with Ontario, Alberta, Manitoba and Saskatchewan, as well as New Brunswick, that would represent six of Canada’s 10 provinces and 29.3 million of the national population of 37.3 million.

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Get in on ground floor

“Exciting to have gotten in on the ground floor … of the Nanushuk,” Ferguson said. “The formation was pretty much overlooked.”

He admitted there is always risk in exploration.

But, Ferguson said, “you’ve got to be in it to win it.”

Like other Nanushuk explorers and developers such as Bill Armstrong, Repsol and Oil Search, another ASX-listed independent, Entek will eventually be looking for a bigger partner.

“We might raise the money for the seismic program on our own, but we’ll have to bring in a larger partner for drilling,” Ferguson said.

Entek reported cash of approximately $2 million and no debt or substantial expenditure commitments in its first quarter after having paid out essentially $2 million in leasing fees and to Elixir for the Alaska acreage.

Peter Stickland has been appointed non-executive chairman of Entek.

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