Petroleum news

page 2 88 Energy issues Icewine JV update; Charlie No. 1 to spud in February

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Shell CEO says major to continue O&G investment, risky not to

REBECCA LOGAN PICKED UP an interesting Reuters article for the Alliance's Oct. 15 AK Headlamp, in which Royal Dutch Shell's CEO was quoted as saying there are ample opportunities to make money from oil and gas in the decades ahead.

Ben van Beurden, who became a prominent industry action advocate on global warming following the 2015 Paris climate agreement, expressed concern that some shareholders might abandon the big energy company due in part to what he described as the unjustified "demonization" of oil and gas.

Shell "set out in 2017 a plan to halve the intensity of its

see INSIDER page 10

DEC is looking for input on its existing C-plan requirements

The Alaska Department of Environmental Conservation is seeking public input on its oil discharge prevention and contingency plan requirements, DEC said in an Oct. 15 public scoping notice.

C-plans are required for facilities and vessels that store and transport oil.

The department would like to receive opinions and suggestions on topics such as whether the current regulations can be made clearer and more understandable without compromising environmental protection, as well as if any portions are outdated or duplicative.

DEC is also interested in new ideas that may make C-plans

see DEC INPUT page 4

BP reports rise in oil output at Prudhoe Bay satellite fields

BP Exploration (Alaska) Inc. says oil production at its Prudhoe Bay satellites has increased overall but is down in two of the five fields.

In a recent annual progress report and plan of development update for the satellites that was submitted to the state Division of Oil and Gas, the Prudhoe Bay operator reported increased oil production at the Aurora, Midnight Sun and Orion fields and a drop in output from Borealis and Polaris. In the previous year a drop in output only occurred at Aurora.

BP files three plans of development each year for the Prudhoe Bay unit — one for the initial participating area early

see BP SATELLITES page 8

Ed King: Alaska oil production could top out at 700,000 bpd

In a recent interview with Petroleum News, Alaska economist Ed King said once the Pikka and Willow projects come online, coupled with the natural decline in older fields, the "net effect" could "top out at 700,000 barrels of oil per day and decline from there."

His numbers are based on public production estimates for the Oil Search operated Pikka unit and the ConocoPhillips-operated Willow unit — 120,000 bpd for Pikka and 130,00 bpd for Willow.

Based on the big North Slope Nanushuk discoveries in these two units, King said "it wouldn't surprise me if, barring unforeseen obstacles, we keep finding and developing more and more

see OIL OUTPUT page 6

EXPLORATION & PRODUCTION

Another new pad

Hilcorp looks to expand Milne access to undeveloped Schrader, Kuparuk oil

By KAY CASHMAN
Petroleum News

Following close behind Moose pad, which began oil production in April, Hilcorp Alaska is planning to add another new pad, Raven, in the North Slope Milne Point unit in order to access more untapped oil in the Schrader Bluff and Kuparuk reservoirs.

On Oct. 9 the US Army Corps of Engineers issued a public notice regarding Hilcorp's application to build the 1,700 feet long by 615 feet wide gravel well pad, widen a road, and install vertical support members for a pipeline.

Raven pad, Hilcorp told the agency, would support new wells, a processing facility, pipeline and utility connections to existing infrastructure, and other facilities to support oil production and transport.

A short section of an existing road along the proposed pad would be widened by 6 feet to provide maneuverability for "large drill rigs."

The work being proposed includes the discharge of up to 262,200 cubic yards of gravel into 28.61 acres of U.S. waters, including wetlands, the application said.

Gravel would be hauled to the construction site in winter over a 4.2 mile ice road from Ugnu Mine Site E (see Milne Point overview map and the Raven pad plan in the pdf version of this story).

The project site is in "Section 6 and 7, T. 13 N., R. 10 E., Umiat Meridian; USGS Quad Map Beechey

see RAVEN PAD page 7

EXPLORATION & PRODUCTION

First trident well 2020

BlueCrest plans one or two wells in 2020 based on its successful fishbone design

BY STEVE SUTHERLIN
For Petroleum News

BlueCrest Alaska Operating LLC plans to drill its first trident fishbone well in 2020 at the Cosmopolitan unit in Cook Inlet, the company said in its sixth plan of development for the unit, filed Sept. 30. The sixth POD covers the 2020 calendar year.

BlueCrest may drill two trident wells in its 2020 drilling program, according to the POD.

"BlueCrest has now advanced the evaluation of the drilling results from the H-16a fishbone well and H-4 fishbone well to the point where we are now ready to proceed with our drilling program,"

J. BENJAMIN JOHNSON

BlueCrest said, adding that the company "has identified a location which will allow us to evaluate this new innovative trident well design."

The company said it would file the 24 individual drilling permits required by the Alaska Oil and Gas Conservation Commission to drill the trident well, following successful confirmation of a pool rules application filed with the AOGCC in August.

BlueCrest initially filed for well spacing exceptions with AOGCC on June 10 for approval of 24 separate well spacing exception requests. AOGCC requested BlueCrest to complete a fieldwide

see TRIDENT WELL page 5

FINANCE & ECONOMY

When good might be bad

With foreign investment exiting Alberta's oil sands, will there be investment?

By GARY PARK
For Petroleum News

At first glance it should be more good news than bad for the domestically controlled sector of Canada's oil and gas industry.

Divestitures of US$30 billion in assets held by foreign-based companies means a sizeable return of ownership in the oil sands to the pioneers who opened up the vast play in northern Alberta.

A good thing? Not necessarily.

Although investment in the resource will no longer be so heavily dependent on U.S. companies and their Canadian branch plants, turning back the clock to a time when only Canadians participated in development of the oil sands doesn't guarantee a return to rapid growth in investment.

The oil sands always have and always will be dependent on U.S. refineries that can process heavy crude and on U.S. investors willing to gamble on a play that has such shaky returns.

Five years since price crash

Just consider the past five years since the oil price crash, when Canadian heavy crude prices plunged to a record low in 2018, drastic job cuts forced Alberta's unemployment rate above 7% and capital spending started a decline that has already lasted five straight years.

If the leading Calgary-based pipeline companies, TC Energy and Enbridge, thought a turnaround was

see SANDS INVESTMENT page 4

● EXPLORATION & PRODUCTION

Charlie No. 1 well plans, JV on track

By KAY CASHMAN
Petroleum News

88 Energy Ltd., via its 100% owned subsidiary Accumulate Energy Alaska, has booked the Nordic 3 rig for the upcoming drilling of its Charlie No. 1 appraisal well in its North Slope Icewine project.


ERIK OPSTAD

Accumulate is headed by general manager of operations Erik Opstad, a state of Alaska certified professional geologist, who has worked the North Slope for 34 years, including years with BP in various roles.

In an Oct. 15 update, the ASX listed Australian company said operational activity for Charlie No. 1 was progressing and that it planned to spud the well in February and finish flow testing in April.

Charlie No. 1 is on state oil and gas lease ADL 393380, west of the existing Icewine wells, and is part of a multiyear program beginning this winter. The 34-mile tundra ice road to the project will start at Mile Post 386.7 of the Dalton Highway.

88 Energy also reported that its farm-out with Premier Oil Plc, its joint venture partner in the Icewine project, is expected to be complete before the end of November.

Captivate Energy Alaska, another wholly owned subsidiary of 88 Energy that is headed by Anchorage-based Opstad, used the Nordic 3 rig last winter for the drilling of the Winx No.1 exploration well in its Western Block project on a lease near the Horseshoe 1/1A well lease. The Horseshoe well was a 2017 oil discovery by operator Armstrong Energy and partner Repsol and is currently operated by Oil Search.

Progress on permitting

"Significant progress" has been made on the permitting front, 88 Energy said in its update, with only two of the key permits now outstanding — the plan of operations and permit to drill, which are both "in the process of being finalized and approved." (The lease plan of operations was submitted in early August; the Alaska Department of Natural Resources' Division of Oil and Gas is taking public comments on the proposal through Oct. 31. See story in the Oct. 6 issue of Petroleum News.).

88 Energy also reported that its farm-out with Premier Oil Plc, its joint venture partner in the Icewine project, is expected to be complete before the end of November.

Additionally, 88 Energy said that tendering and finalization of contracts for equipment and services needed for Charlie No. 1 are advancing as planned.

The well has been designed as a step out appraisal of the Malguk-1 well drilled in 1991 by BP, which encountered

see CHARLIE WELL page 3

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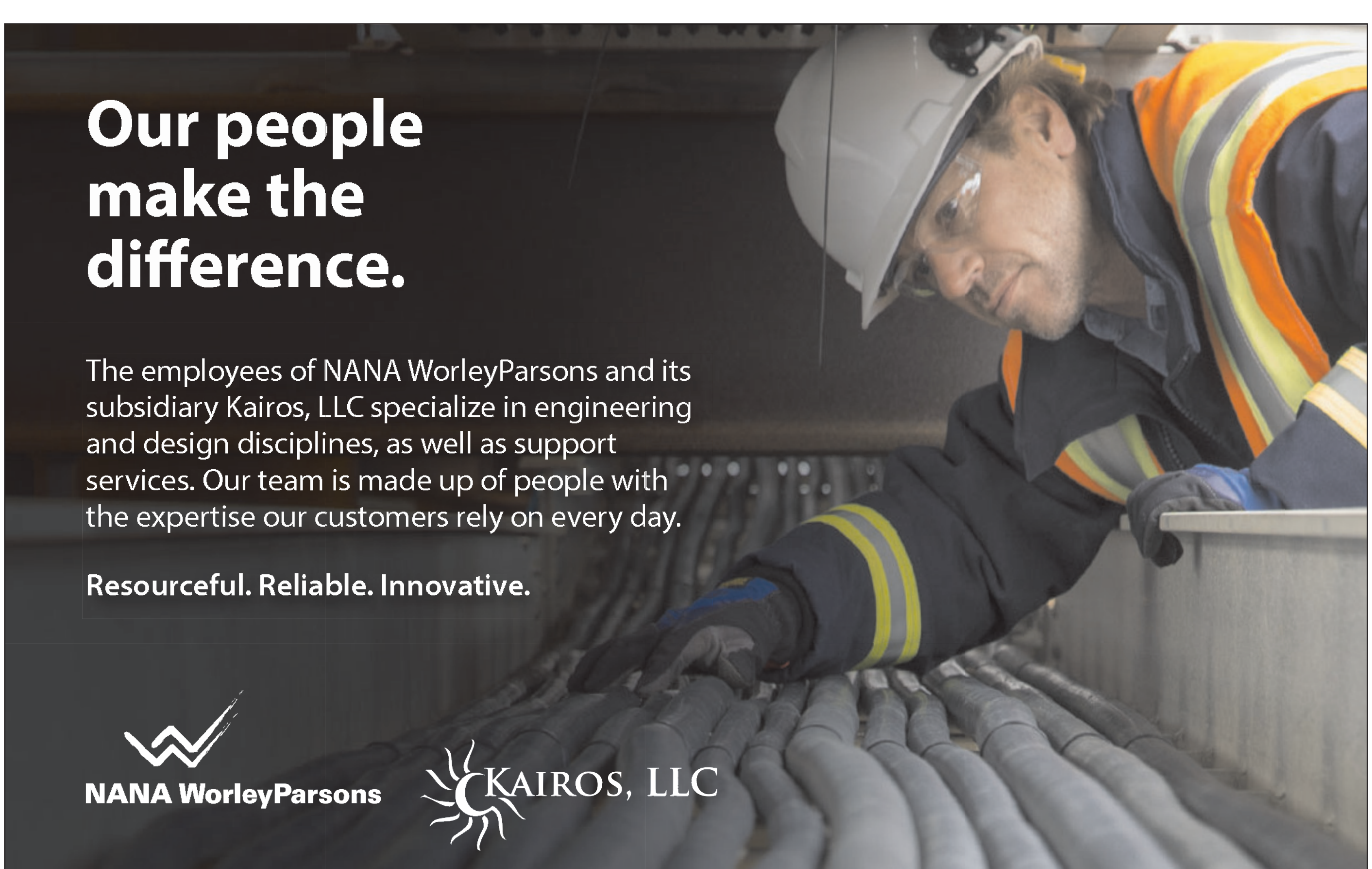

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● FINANCE & ECONOMY

O&G tax hike draws closer to 2020 ballot

By KAY CASHMAN

Petroleum News

A ballot initiative that will ask Alaska voters to increase oil taxes in order to support state spending reached the next step in the process on Oct. 15 when Lt. Gov. Kevin Meyer certified its application.

The initiative's supporters can now gather signatures to get what they call the "Fair Share Act" on the ballot in 2020.

If approved by voters, the initiative would rewrite Senate Bill 21, which was passed by the Alaska Legislature in 2013 to replace the former oil tax structure, ACES — Alaska's Clear and Equitable Share."

ACES is blamed by many analysts and industry observers for the slowdown in oil exploration and production several years ago, negatively impacting Alaska's jobs and economy.

The lieutenant governor is responsible for determining the legality of ballot initiatives and whether enough qualified voters have signed on to the petition.

While the Alaska Department of Law's review of the application found it legal, it found the act itself vague and difficult to interpret.

The proposed law "raises a number of implementation and constitutional questions" that would need to be dealt with if it's enacted, Alaska Attorney General Kevin Clarkson wrote.

Petition sponsors have one year to file the initiative petition from the date they're notified by the Division of Elections the booklets are ready.

Proponents have said that if the act had been in effect for Fiscal Year 2018, it would have produced an additional $1.1 billion for the state.

They have also said that many of the recent controversial budget cuts would not have been necessary.

Opponents have also weighed in.

"This proposed ballot measure is yet another flawed attempt to adopt complicated tax policy through the initiative process," Kara Moriarty, president & CEO of the Alaska Oil & Gas Association, said.

"While the sponsors say it will not have any impact, make no mistake, no industry in Alaska can sustain a $1 billion plus tax hike without negatively impacting investment decisions for their business, which creates less opportunity for jobs for Alaskans," she said.

According to a KTUU report, the group behind the initiative must gather signatures amounting to greater than 10% of the total ballots cast in Alaska's last general election. Out of that total figure, 70% of the signatures would have to come from across 30 separate house districts.

If passed into law, the Legislature cannot change the act for two years.

"It's take-it-or-leave-it lawmaking without the balanced review good legislation needs," economist Roger Marks said Oct. 16. In private practice now, Marks formerly served as a petroleum economist with the Tax Division in the Alaska Department of Revenue. ●

Contact Kay Cashman at publisher@petroleumnews.com

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CHARLIE WELL

oil shows with elevated resistivity and mud gas readings over multiple horizons during drilling but was not tested due to complications towards the end of operations.

Malguk-1 was also drilled using vintage 2D seismic, which 88 Energy said was "insufficient to adequately determine the extent" of any of the prospective targets encountered.

88 Energy did a revised petrophysical analysis, which identified what it interpreted as bypassed pay (reportedly 251 feet of light oil pay in turbidite sands in the Brookian Torok formation) in the Malguk-1 well. 88 Energy also acquired modern 3D seismic in 2018 over the area in order to determine the extent of the oil accumulations.

Charlie No. 1 will intersect seven stacked prospects, four of which are interpreted as oil bearing in Malguk-1 and are therefore considered appraisal targets, 88 Energy said.

Under the farm-out agreement, Premier Oil is picking up the cost of drilling (up to US$23 million).

According to 88 Energy, the total gross mean prospective resource across the seven stacked targets that Charlie No. 1 will intersect is 1.6 billion barrels of oil (480 million barrels net to 88 Energy). ●

Contact Kay Cashman at publisher@petroleumnews.com

ENERGY EFFICIENCY

Lighting up 47 rural Alaska communities

The Alaska Energy Authority, or AEA, said Oct. 14 that 47 rural Alaska communities from across the state have been selected to receive funding under a new Village Energy Efficiency Program initiative that is supported with a $1 million grant from Wells Fargo.

Eligible communities under VEEP are those with a population no greater than 8,000, ARA said in a press release.

The 47 communities will receive approximately $1.1 million in Wells Fargo and AEA funding, with local match at approximately $397,000.

The city of Ouzinkie and the municipality of Skagway are just two examples of communities that can anticipate annual savings after using the funds to replace existing lighting with the latest in LED technology, AEA said:

In Ouzinkie, 55 streetlights and six harbor lights are expected to be replaced, reducing the city's electric consumption by nearly 60%, with more than $8,000 in annual savings anticipated.

Skagway will replace 27 streetlights. Its electric use is expected to be reduced by nearly 50%, resulting in more than $1,200 savings annually.

The Wells Fargo Outdoor Lighting Program, announced in August, is a unique public/private partnership designed to benefit rural Alaska communities by providing efficient outdoor lighting that can help reduce long-term fixed energy costs, while supporting community health and public safety.

AEA is a public corporation of the state. Its mission is to reduce the cost of energy in Alaska.

—PETROLEUM NEWS

EXPLORATION & PRODUCITON

US drilling rig count, at 856, up by one

Baker Hughes reports the number of rigs drilling for oil and natural gas in the U.S. was up by one the week ending Oct. 11 to 856, following four weeks of declining numbers.

In its weekly rig count the Houston oilfield services company said the active rig count was down 207 from 1,063 active rigs a year ago.

The company reported that 712 rigs targeted oil (up two from the previous week; down 157 from a year ago) and 143 targeted natural gas (down one from the previous week; down 50 from a year ago). There was one miscellaneous rig active (unchanged from the previous week; unchanged from a year ago).

The company said 55 of the U.S. holes were directional, 750 were horizontal and 51 were vertical.

Texas, with the largest active rig count in the country at 420, was up six from the previous week.

West Virginia was up by three rigs from the previous week; Louisiana was up by two.

The rig counts for California, Colorado, North Dakota, Utah and Wyoming were unchanged from the previous week.

Alaska, New Mexico, Ohio and Oklahoma were each down by one rig.

Pennsylvania was down by four rigs.

Baker Hughes shows Alaska with eight rigs active for the week ending Oct. 11, up from five a year ago.

The U.S. rig count peaked at 4,530 in 1981. It bottomed out in May 2016 at 404.

—KRISTEN NELSON

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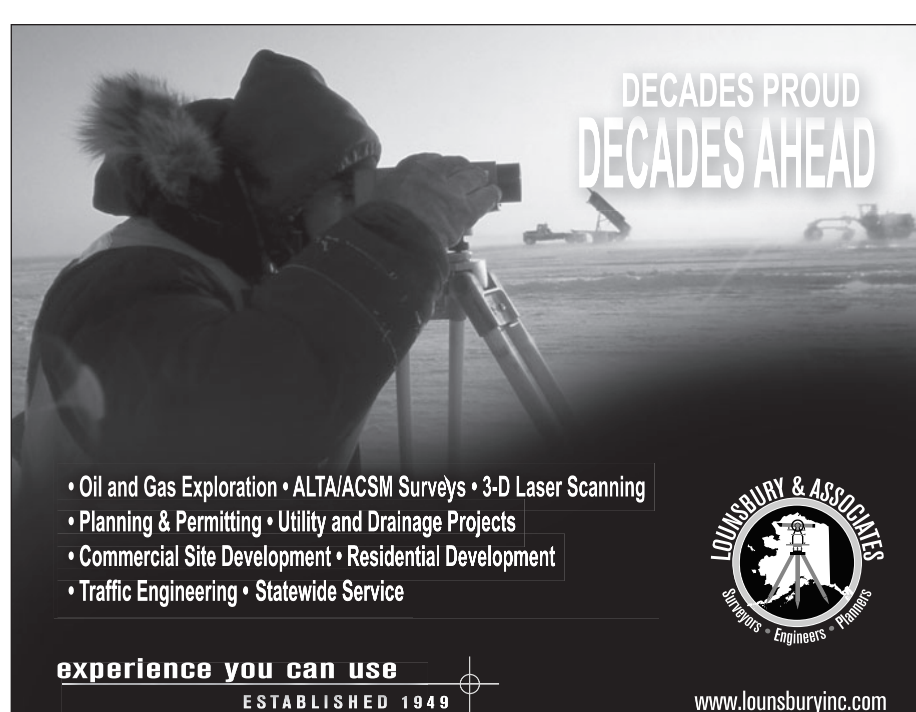

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SANDS INVESTMENT

in store for major transportation projects "they might need to hold on," said Laura Lau, who manages more than C$2 billion in market investment at Brompton Corp. in Toronto. "The pipeline situation is getting worse; everything is getting worse."

That grim assessment, which includes the ponderous rate of approvals by Canada's regulators and soaring opposition to any form of oil and gas development, explains why companies such as Kinder Morgan, ConocoPhillips, Royal Dutch Shell, Marathon Oil and Murphy Oil have jammed the oil sands' exit doors.

Decline in foreign interest

The result is mirrored in the decline of oil sands output by non-Canadian companies. The Alberta Energy Regulator has reported that the volumes rose from 320,000 barrels per day in 2010 to 647,000 bpd in 2014, then started a slide to 573,000 bpd in 2018.

The Canadian Press has calculated that the working interest by foreign companies has varied from 22% of total oil sands output of 1.44 million bpd in 2010 to 33% of 1.98 million bpd in 2014 and 20% of 2.9 million bpd in 2018.

The move by Oklahoma-based Devon Energy to sell its Jackfish thermal recovery project of 100,000 bpd to Canadian Natural Resources has further lowered the "foreign" share to 16%.

The underlying reason for the pullout was explained by Patrick Pouyanne, chief executive officer of France's Total, when the company sold its undeveloped Joslyn oil sands project to Canadian Natural.

"Reducing our exposure to Canada's oil sands by selling this asset is in line with our global strategy to focus our oil investments on low breakeven resources and develop a resilient portfolio in the mid- and long-term," he said in a statement.

Even so, Total remains the largest, foreign-controlled producer at 101,000 bpd, while CNOOC, the state-owned Chinese giant, reached 71,000 bpd.

Some assets retained

ExxonMobil (partly through its 70% owned Imperial Oil), Japanese and other Chinese companies (PetroChina and Sinopec) are all retaining some production assets and refining stakes in the oil sands.

PetroChina, which paid C$3.8 billion over five years from 2009 for stakes in three projects, is testing various technologies to raise its production and said it is "committed to Canada for the long-term, having maintained its investments through economically challenging times."

CNOOC said its oil sands interests are an important part of the company's North American portfolio and will remain in its Canadian operations.

Upcoming election

For those in search of hope, there might be some in the Canadian election on Oct. 21 when a victory for Conservative leader Andrew Scheer might inject hope where there is a lack of trust in the Liberal administration of Justin Trudeau.

Rafi Tahmazian, a senior portfolio manager at Canoe Financial, said a change of government should help restore the perceptions of foreign investors in the support they could count on from the federal government, even to the extent of removing a ban on oil tankers operating off the northern coast of British Columbia and scrapping Trudeau's plan to overhaul regulatory approvals.

He said the positive aspect of the overhaul of industry ownership is that "Canada owns Canada again."

Alberta priorities

For Alberta, the priorities are clear: It wants to unplug the regulatory logjam, remove the choke points on rail and pipeline delivery systems, open up new markets both onshore and offshore, and once more attract capital investment.

But the road ahead will likely be long, bumpy and uncertain.

Alberta Energy Minister Sonya Savage is troubled that petroleum producers have failed to raise spending despite her government lowering corporate taxes and promising another cutback. Even so she is calling for patience.

Although several large producers posted improved second quarter results, only a minority have hiked spending plans.

Savage said some are actually taking advantage of their bottom-line improvement "to buy back shares and to reposition and balance their books. It's the same as when you are a private citizen. You come across a windfall and you pay down the mortgage."

She told the Calgary Herald that the government would "like to see that money being invested into jobs. We'd like it to stay here in Alberta."

The United Conservative Party government of Premier Jason Kenney pledged when elected in April to lower the corporate tax rate by one-third to 8%, estimating that would create 55,000 jobs and expand the economy by C$12.7 billion.

Instead, Alberta's unemployment rate topped 7% in July as 14,300 jobs were lost.

Free cash flow up

However, some signs were encouraging, with the six largest oil sands players reporting C$3.6 billion in free cash flow, up by C$900 million from the first quarter, BMO Capital Markets reported.

Peter Tertzakian, executive director of ARC Energy Research Institute, said companies are mostly diverting their new money for share buybacks or raising dividends, noting Alberta does not need new production in a constrained market.

"Why would you invest your surplus if you can't sell the product?" he asked.

Only moderately encouraging was the Kenney government's first fiscal update covering the April to June quarter, which showed a fiscal deficit of C$835 million, down 30% from the same period of 2018, while resource revenues from oil grew by C$164 million from the first quarter and corporate and personal income tax revenues gained C$166 million from a year earlier.

But Alberta Finance Minister Travis Toews emphasized several times that revenues were essentially flat and warned of a "period of restraint" when his government releases its first budget in late October.

He said the fiscal update was "difficult" given that revenues were flat and operating expenditures were up.

"We have been clear all along, given the state of Alberta's finances, we are entering into a period of restraint. There is no doubt about that," Toews said, while his province braced itself for billions of dollars in widespread spending cuts. ●

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DEC INPUT

more effective.

Based on the feedback from this scoping process, the department may consider amending C-plan regulations (18 AAC 75, Article 4).

DEC is also accepting comments on the related statutes that authorize the Article 4 regulations.

The department said that no specific regulation revisions are proposed at this time, and there are no draft regulations to review. Depending on the input received on the existing regs and statutes, a formal regulation draft and review process may be initiated and would be subject to public review and comment.

All public comments will be considered and posted on DEC's website, but the department said it would not be preparing a responsiveness summary.

Written comments must be received no later than 11:59 pm on Jan. 15, 2020.

To submit your comments electronically, visit: http://alaskadec.commentinput.com

—KAY CASHMAN

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TRIDENT WELL

development plan to avoid individual well spacing exceptions in the future, in the interest of avoiding excess workload for both BlueCrest and AOGCC over the course of development of the field.

The trident configuration involves the drilling of three fishbone wells into the Hansen oil pool from a single wellbore drilled 3 miles out and 1.5 miles down from the company's shore-based pad situated north of the city of Anchor Point on the lower Kenai Peninsula. Typically, the company drills up to an additional 1.5 miles into the formation from the point of contact with the reservoir.

"Each fishbone well contacts the same amount of reservoir rock as seven-nine individual horizontal wells, and each trident well should recover the same ultimate reserves as three fishbone wells since the reservoir contact is the same, so, each trident well provides the same amount of reservoir contact as 21-27 individual wells."
—J. Benjamin Johnson

COURTESY BLUECREST

BlueCrest Rig No.1

"The fishbone wells achieve significantly more reservoir contact and penetration than conventional wells," J. Benjamin Johnson, BlueCrest Energy CEO and president told Petroleum News.

"Each fishbone well contacts the same amount of reservoir rock as seven-nine individual horizontal wells, and each trident well should recover the same ultimate reserves as three fishbone wells since the reservoir contact is the same," Johnson said, adding, "so, each trident well provides the same amount of reservoir contact as 21-27 individual wells."

Under the original fishbone concept, one long horizontal "mainbore" runs along the bottom of the oil zone, from which multiple full diameter wellbores are drilled upward to penetrate individual productive oil sands.

The way the fishbone wells are drilled yields the equivalent of an 800-foot spacing well program, BlueCrest said in the POD.

"Each trident well saves five months to drill the wells that would reach the same reservoir penetration with just the fishbone wells," Johnson said.

Using its powerful purpose commissioned directional drilling rig, BlueCrest Rig No. 1, the company can accurately steer paths of wells throughout the reservoirs. BlueCrest has adapted its dynamic approach to the drilling program at Cosmopolitan based on the knowledge it has gained from each of the wells it has drilled.

After studying the results of the H-12 fishbone well and the H16a fishbone well, BlueCrest made the decision to drill the H-4 step out well – with seven individual permitted wells – to prove up the reserves on the previously untested south side of the structure.

"This well continues to substantiate the reserves and extent of the southern reservoir," the company said, adding that the H-4 well, brought on production March 22, currently provides approximately 26% of its oil production.

Long term, BlueCrest plans to continue to develop the Starichkof / Hemlock oil reservoir while continuing to evaluate different secondary and enhanced oil recovery programs. "Gas reservoir development will remain in a planning stage until market opportunities develop," the company said. ●

Contact Steve Sutherlin at ssutherlin@petroleumnews.com

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OIL OUTPUT

of these prospects," given that the North Slope is proving to be "what some geologists have been saying for years — "an underexplored basin."

If more Pikka and Willow-sized discoveries are developed, then production of 500,000-700,000 bpd could last for one, two or possibly more decades, he said in the Oct. 16 interview.

In slides King used in his Alliance presentation in Fairbanks Oct. 10, the shorter term oil production picture is less optimistic, increasing to more than 520,000 bpd for a few months in 2020 and then dropping to just under 500,000 bpd in June.

But he said in the interview that he sees only a "slight decrease in production in the next fiscal year," July 1, 2020 through June 30,2021."

The first Pikka production is scheduled to come online in mid-2022; Willow in 2025-26.

What to watch for

The occurrences in Fiscal Year 2020 (July 1, 2019-June 30, 2020) that will impact production levels and therefore state income and Alaska's economy, are as follows, per King:

- The completion of BP/Hilcorp sale and its impact on jobs.
- Another active exploration season with more exciting announcements.
- Extended reach drilling beginning in the Colville River unit.
- CD5 second expansion to be drilled.
- GMT-2 (Greater Mooses Tooth 2) development should make for busy winter.
- Pikka final investment decision expected next summer.
- Willow ROD (record of decision) should be issued.
- ANWR lease sale should bring strong showing.
- Oil tax initiative will create confusion.
- Climate change dialogue around presidential campaign will damage investor sentiment.

COURTESY ED KING

What could go wrong?

Scott Jepsen, ConocoPhillips Alaska's vice president of external affairs and transportation, weighed in recently on what could derail his company's plans for the Willow development, a new drill site at GMT-2 in the National Petroleum Reserve-Alaska with a goal of first oil in 2021 (35,000 to 40,000 bpd), and plans to produce the Nuna prospect in 2022 (25,000 bpd per former operator) from the Kuparuk River unit.

If more Pikka and Willow-sized discoveries are developed, then production of 500,000-700,000 bpd could last for one, two or possibly more decades, Ed King said in the Oct. 16 interview.

The proposed oil tax initiative noted by King is a serious threat to future investment, Jepsen told the Alaska Support Industry Alliance Sept. 12, especially with competition from areas outside Alaska, such as the Permian basin.

Oil prices

The price of crude is also a factor in the continued health of Alaska's oil and gas industry.

"Oil prices are not predictable," King said. "Lately they've been trading in the $60-65 range … I would expect prices above $65 or so in the next year, but a global economic slowdown could change that … bring prices down."

There are upsides such as supply disruptions that also impact prices, he said.

"Weighing in the downsides versus the upsides, I expect prices to average $60-65 in the next year," King said.

Alaska jobs

The good news, from King's slides, is that oil wages are growing again.

As for the job losses from Hilcorp buying BP and assuming operatorship of all BP's North Slope operations, King sees jobs at headquarters in Anchorage going down but given the "expanding activities" on the North Slope, "I don't know what will happen there."

His slides show the usual seasonal fluctuation, or downturn, in June.

King is not sure the impact on the Anchorage housing market will be as bad as some are predicting.

Hilcorp's acquisition is "not necessarily going to interrupt the rest of the economy a whole lot," King said, as he sees many BP employees taking severance packages and staying in their homes.

—KAY CASHMAN

Contact Kay Cashman at publisher@petroleumnews.com

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continued from page 1

RAVEN PAD

Point C-5; near Latitude 70.50173º N., Longitude 149.66902º W.; approximately 35 miles northwest of Deadhorse Airport and five miles west of Milne Point," the Corps said.

Proposed schedule

Construction of the ice road from the mine site is expected to begin in December and be completed in February, Hilcorp said.

Pad and road construction will begin after the ice road is finished and require approximately three months to complete.

In July 2020, once the ground is thawed, the pad and road surface will be turned and re-compacted, Hilcorp said.

Flowline construction will occur during the following ice road season.

Pad utilities and infrastructure will be installed following pad compaction.

Producing since 1980s

Hilcorp became operator at Milne Point in November 2014 when its acquisition of several North Slope properties from BP closed, including a 50% interest in Milne. Since then Hilcorp has been successfully working to increase Milne oil production, which per Alaska Oil and Gas Conservation Commission data averaged 18,177 barrels per day in October 2014 as compared to a July 2019 average of 26,765 bpd — not bad for a mature field that has been producing since the 1980s.

Hilcorp currently has production from 12 pads at Milne, including Moose pad, which was the first new pad in the unit since 2002.

Two to three pads

In an April application to the Corps to expand gravel mining at Milne, Hilcorp mentioned the new pad, simply referring to it as R pad

Hilcorp told the Corps it required "enough gravel for 2 to 3 pads initially."

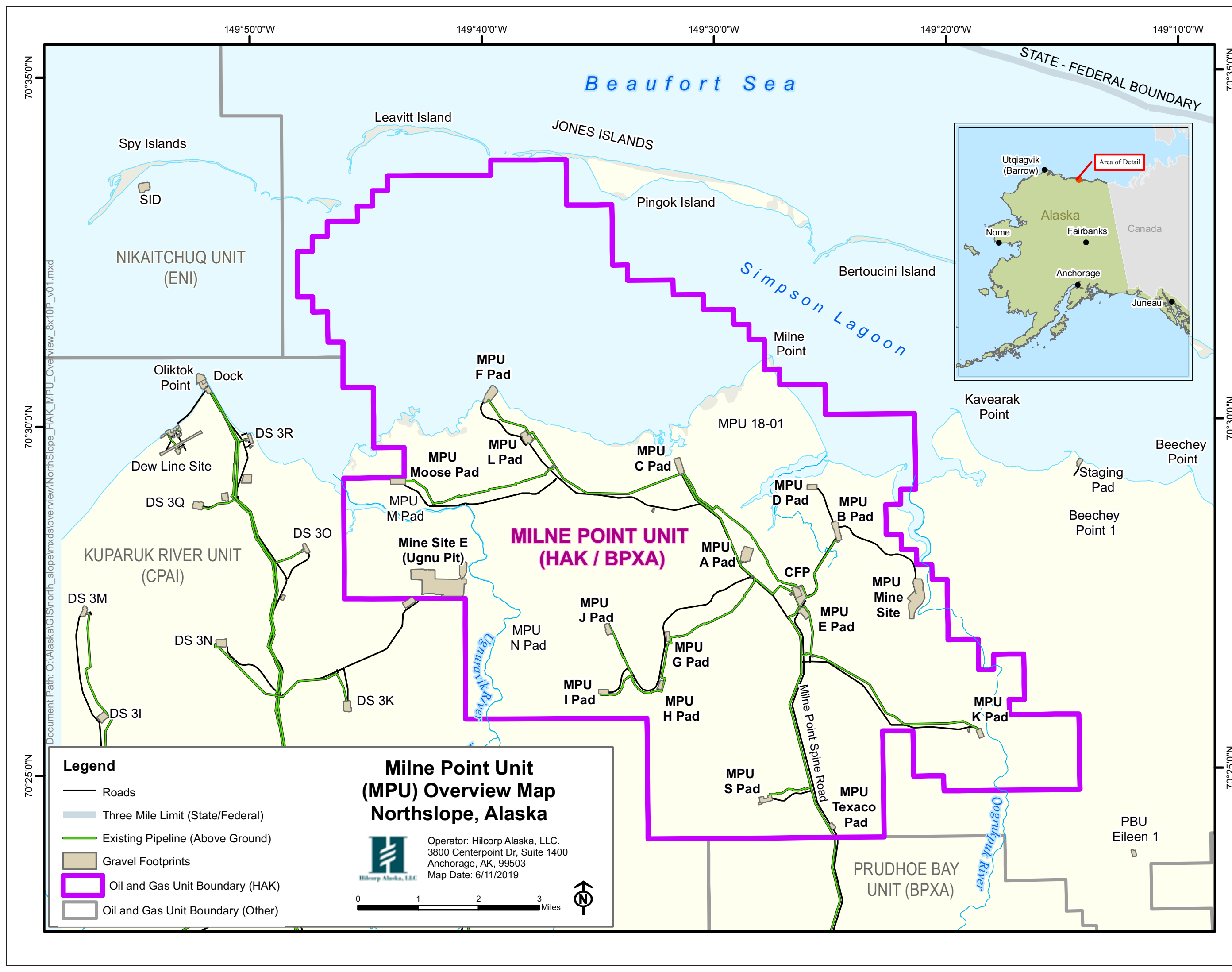
The R pad development would be south of F pad, the company told the Corps, noting that additional pad expansions would be required for new wells to increase Milne Point unit production.

F pad is the most northerly of the Milne Point pads, near the Beaufort Sea coast and northeast of L pad (see map).

The new mining was estimated to occur from 2019 to 2024 (see the May 5, 2019 edition of Petroleum News for the full story).

Ahead for Milne Point

The initial production rate for Moose pad was 3,000 bpd from two wells, Hilcorp spokeswoman Lori Nelson told Petroleum News in an April 15 email.



In a presentation last November, David Wilkins, Hilcorp's senior vice president for Alaska, told the Resource Development Council that the pad can accommodate 50 to 70 wells — and that processing facilities at Moose pad can handle 85,000 barrels of fluid per day.

Nelson said Hilcorp will invest a total of $400 million "to fully develop Moose pad and its facilities."

Peak production from the pad is expected to be 22,000 bpd.

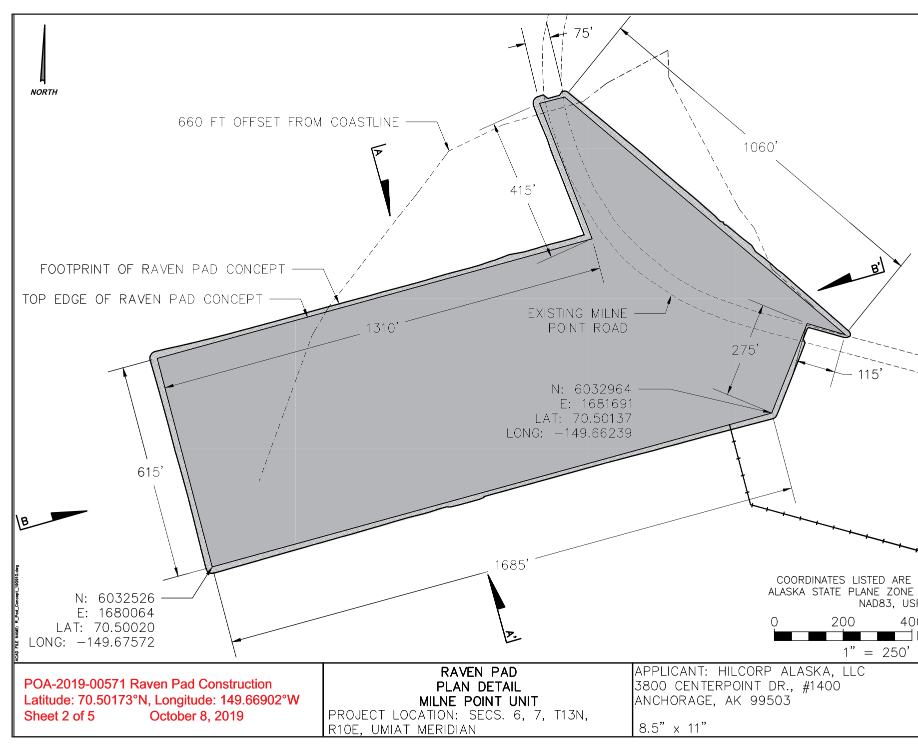
That level of detail has not yet been released by the company for Raven pad.

Milne Point mainly produces from the Kuparuk (light oil) and Schrader Bluff (viscous oil) reservoirs and will soon again be producing from the Ugnu and Sag River (both viscous) reservoirs, per Hilcorp' s most recent plan of development that was filed with Alaska's Division of Oil and Gas.

Currently, the field's output is split almost half and half between light and viscous oil, but as the field ages, Wilkins said, those percentages will change, and more viscous oil will be extracted.

On June 10, Hilcorp received authorization from the Division to install a third polymer injection facility in the Milne Point field, this time at F pad.

Injecting polymer and water into the field has been more successful in coaxing the viscous crude — oil with the consistency of syrup — from the reservoirs than conventional waterflood, Wilkins said.



Both J pad and Moose pad already have polymer injection facilities.

Using polymer, Hilcorp expects to increase crude recovery from 10 to 15% of the oil in place at Milne to as much as 50%, per slides Wilkins used in his November presentation. According to Hilcorp there are approximately 1.3 billion barrels of viscous oil in the Milne Point unit.

Injecting polymer along with water into a reservoir for enhanced oil recovery, Wilkins said, is a technique that has a 30-year track record in other parts of the world but had not been tried on the North Slope until Hilcorp installed a small facility on J pad. ●

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COURTESY BP EXPLORATION (ALASKA)

Gathering Center 2, or GC-2.

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BP SATELLITES

in the year, one for the Greater Point McIntyre area in the middle of the year and one for the satellites in the fourth quarter.

The plan of development, or POD, update in BP's Sept. 30 filing was for 2020, while the annual progress portion of the document was for July 1, 2018 through June 30.

Annual progress at Aurora

Mobil Oil discovered the Aurora oil pool in the northwest corner of the Prudhoe Bay field in 1969, while delineating Prudhoe Bay.

The average oil production rate for the Aurora field for the annual reporting period ending June 30 was 5,291 barrels per day. In the previous year Aurora produced an average of 4,609 bpd, which was slightly down from 4,696 bpd the year before that.

Development of the Aurora reservoir has focused on phased drilling of production and injection wells from S pad. Production is commingled with other Prudhoe Bay production on S pad and processed at Gathering Center 2, or GC-2.

Water injection was started at Aurora in December 2001.

Tertiary recovery, utilizing Prudhoe Bay miscible gas for water-alternating-gas injection, or WAG, was started in December 2003. All injectors at Aurora were designated as WAG injectors at the end of the latest reporting period.

Tertiary recovery is also known as enhanced oil recovery and is the third phase of oil extraction from an oil reservoir. It allows a field operator to remove a significant amount of oil from a reservoir which they normally would not be able to access.

With field startup in November 2000 and an estimated 200 million barrels of oil in place at Aurora, cumulative production reached 45.1 bpd by June 30 of this year. At that time there were 35 active wells at S pad – 20 oil producers and 15 injectors.

In 2019, BP conducted 66 wellwork jobs on producers and injectors to minimize oil rate decline, including "tree change outs, gas lift optimization, hot oil treatments, SSV/SSSV work, and VSM repairs," which are common in most of BP's workovers.

Of the 66 well work jobs, 20 were rate adding with the remainder maintenance and rate sustainment.

Among other things, the company also side-tracked well S-105A and put it online in second quarter, put a concentric liner in S-109 and hydraulically fractured it, attempted a fill cleanout in S-26 (coil tubing got stuck, fish left in the well), and added perforations in S-113BL1 and S-129.

The most recent new well prior to 2019 was S-200A, a producer spud in October 2017.

Aurora 2020 POD

BP made no firm drilling commitments at the Aurora field for next year but said it expected to continue its existing workover regimen. The company is evaluating potential infill drilling targets identified from its geological models, including recent well results.

BP's Aurora reservoir management strategy is to utilize injection-to-withdrawal, or I/W, ratios at a pattern level that maintains reservoir pressure above minimum miscibility pressure for the miscible flood process, which is accomplished by "setting optimum injection rates, additional drilling, workovers of existing wells, and cycling high gas-to-oil-ratio production wells as needed."

Annual progress at Borealis

Mobil Oil discovered the Borealis oil pool along the western edge of the Prudhoe Bay field in 1969 while delineating Prudhoe.

BP brought the field online in 2001 from L pad, and expanded development to include V pad in April 2002 and Z pad in March 2004.

The average oil production rate for the Borealis field for the reporting period was 5,905 bpd. In the previous year the field had produced an average of 7,914 bpd, which was up considerably from the 6,040 bpd for the year before that.

With an estimated 350 million barrels of oil in place at Borealis, cumulatively the field has produced 88.2 bpd through the end of June, and there are 24 active wells at L pad (15 oil producers and 9 injectors), 20 active wells at V pad (12 oil producers and 8 injectors) and 8 active wells at Z pad (4 oil producers and 4 injectors).

Development of the Borealis reservoir has focused on phased drilling of production and injection wells from L, V, and Z pads. Production is commingled with initial producing area, or IPA, and Orion production on L and V pads, IPA production at Z pad and processed at GC-2.

Water injection was started at Borealis in June 2002.

Tertiary recovery, utilizing Prudhoe Bay miscible injectant for water-alternating-gas injection, was started in June 2004 as a pilot and fieldwide miscible gas

see **BP SATELLITES** *page 9*

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BP SATELLITES

injection began in mid-2005.

BP conducted 70 wellwork jobs on producers and injectors during the reporting period that ended June 30.

Of the70, 21 were rate adding with the balance being maintenance and rate sustaining.

Significant activities at Borealis included drilling L-118L1, with first production from it in third quarter 2018, Z-113 getting a fill cleanout and profile modification in October 2018, L-119 getting an OA down squeeze in November 2018, perforations added in March of this year to L-118L1, and MI injected into nine water-alternating-gas injectors.

Borealis 2020 POD

As with Aurora, BP made no firm drilling commitments for the Borealis field for the coming year but said it expected to continue its existing workover regimen. The company is evaluating potential infill drilling targets identified from its geological models, including recent well results.

The Borealis reservoir management strategy is to utilize injection-to-withdrawal ratios at a pattern level to maintain the reservoir pressure above minimum miscibility pressure for the miscible flood process. This is accomplished by setting optimum injection rates, additional drilling, workovers of existing wells, and cycling high as-to-oil-ratio production wells as needed.

Annual progress at Midnight Sun

The average oil production rate for the Midnight Sun field for the reporting period was 1.394 bpd, up from the previous year of 1,158 bpd, which was up from the 983 bpd for the year before that.

With an estimated 100 million barrels of oil in place cumulatively Midnight Sun has produced 22.1 bpd through the end of June and a total of six wells have been drilled in the field, with the most recent one drilled in early 2015.

Historically development has consisted of two producing wells (E-101 and E102), three water injection wells (E-100, E-103, E-104) and one WAG well (P1-122).

Currently five wells remain in the Midnight Sun reservoir; the E-100 injector was recently sidetracked to BP's Sambuca field and is no longer in service of Midnight Sun.

BP discovered Midnight Sun with the Sambuca No. 1 exploration well in 1997 and began production from the Kuparuk formation in October 1998, targeting Ivishak sandstone, but tapping quantities of oil in what a Alaska Superior Court decision later described as "a geographically discrete bed of oil-bearing Kuparuk C, the Midnight Sun reservoir."

ARCO Alaska, which named the well, said in 1998 that the Midnight Sun reservoir was one of two intervals discovered in Sambuca No. 1. The Kuparuk interval, the Midnight Sun field, tested approximately 4,000 bpd of 29 API gravity oil and 1.5 million standard cubic feet of gas per day. The shallower Sag/Ivishak interval, the Sambuca field, tested 1,400 bpd of 24 API gravity oil and 490,000 standard cubic feet of gas per day.

Water injection at the Midnight Sun field started in October 2000, MI began in 2016 and WAG in 2019.

Midnight Sun 2020 POD

The reservoir management strategy at Midnight Sun has been to target a fieldwide injection-to-withdrawal ratio of 1.0 to 1.3 to maintain reservoir pressure while minimizing resaturation of oil into the gas cap.

During the period July 1, 2018 to June 30, an average voidage replacement ratio of 0.39 was achieved primarily because E-103 was off-line since May 2018. E-102 production was shut-in in May for voidage/pressure management and uncompetitive watercut as a result of no response to P1-122 MI injection.

Voidage replacement refers to replacing the volume of oil, gas and water produced from the reservoir by injected fluids. Voidage replacement ratio is the ratio of reservoir barrels of injected fluid to reservoir barrels of produced fluid.

BP's plan for Midnight Sun is to continue reservoir surveillance in order to "evaluate waterflood/EOR performance, fluid movement, well integrity, and the opportunity for well work and redevelopment."

BP said that as the waterflood continues to mature, sidetracking the producers within the pool to maximize oil recovery will be evaluated after the benefits from WAG injection are realized.

No additional injectors or producers are planned for 2020.

Orion oil production

The average oil production rate for the Orion field for the reporting period ending June 30 was 4,955 bpd, up

see **BP SATELLITES** *page 11*

Petroleum news

Oil Patch Bits

DUS security team recognized for superior performance

Denali Universal Services said recently that it is honored to announce that the Outstanding Security Performance Awards in conjunction with the leading industry group American Society for Industrial Standards has recognized the DUS security team at Alaska Regional Hospital as finalists for their leadership, innovation, partnership with the client and stellar performance.

The Outstanding Security Performance Awards recognize and reward companies and individuals across the security sector. The OSPAs are designed to be both independent and inclusive, providing an opportunity for outstanding performers, whether individuals or companies to be recognized and their success to be celebrated. The OSPAs are the only global system for recognizing outstanding performance in the security industry.

"I congratulate the security team at Alaska Regional Hospital for their commitment to high standards of professionalism, community well-being and safety every day," said Bob Kean, president and CEO of Denali Universal Services. "We are extremely honored to be selected as a finalist along with a tremendously fine group of security professionals in our industry across the US. This finalist selection exemplifies our commitment to performance and the values that are part of our core culture."

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Sincerely,
Kay Cashman

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INSIDER

greenhouse emissions by the middle of the century," Reuters reporters Ron Bousso and Dmitry Zhannikov wrote in the Oct. 14 article.

Nonetheless, they reported, the amount of carbon dioxide emitted from Shell's operations and products rose by 2.5% between 2017 and 2018.

BEN VAN BEURDEN

In an exclusive interview with the Dutch CEO in London, a "defiant" van Beurden rejected increasing complaints from climate activists and elements in the investor community to transform the 112-year-old company's traditional business model, Reuters wrote.

"Despite what a lot of activists say, it is entirely legitimate to invest in oil and gas because the world demands it," van Beurden said, noting Shell has "no choice" but to invest in long-life projects.

Shell plans to approve more than 35 new oil and gas projects by 2025, according to an investor presentation from June, the article said.

"We can sustain an upstream portfolio all the way into the 2030s if there is an economic rationale for doing that and a societal rationale for doing that," van Beurden was quoted as saying.

"Fortunately enough, we have more of those than we have money to spend on them."

Van Beurden rejected arguments that Shell's oil and gas reserves would become economically unviable, or stranded, in the future.

Rather, his position is that a lack of investment in oil and gas projects could lead to a supply shortage and spikes in oil prices.

"One of the bigger risks is not so much that we will become dinosaurs because we are still investing in oil and gas when there is no need for it anymore. A bigger risk is prematurely turning your back on oil and gas," he said.

Shell plans to increase its annual capital expenditures to $32 billion by 2025 from the current $25 billion, Reuters reported, with up to 10% earmarked for renewables and the power business.

LNG long-term future bright

Regarding liquefied natural gas, in which Shell is the world's biggest trader, van Beurden told Reuters the market would exhibit oversupply in the near term: "But (LNG) demand will continue to grow at a pace that is roughly four times that of oil."

According to the article, Shell has become a "focal point of environmental protests, particularly in Europe, with regular demonstrations outside its London headquarters and the British National Theatre dropping Shell's sponsorship in recent months."

Van Beurden put the responsibility for achieving a transformation to low-carbon economies on governments, saying not enough progress has been made to reach the Paris climate goal of limiting global warming to "well below 2 degrees Celsius above pre-industrial levels" by the end of this century, Reuters reported.

"Can that happen? I think it can ... Increasingly society is not putting up with the fact we are not making enough progress," van Beurden said.

—KAY CASHMAN

Contact Kay Cashman at publisher@petroleumnews.com

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BP SATELLITES

from the previous year of 3,900 bpd, which was up from the 3,469 bpd for the year before that.

Of the 3.2 billion barrels of oil in place at Orion, cumulatively the field has produced 35.1 bpd through the end of June.

A total of 14 wells at L pad are active in the field as of June 30 — 5 oil producers and 9 injectors; with 20 active wells at V pad — 5 oil producers and 15 injectors.

The most recent well was drilled in November 2017, L-205A, a producer.

Annual progress at Orion

Mobil Oil discovered the Orion oil pool in the northwest corner of the Prudhoe Bay unit in 1968 while delineating Prudhoe. BP confirmed the accumulation in 1998, began initial drilling in December 2001 and brought the field online in April 2002.

The company originally developed Orion from V pad and expanded development in mid-2004 to include L pad.

Development of Orion's reservoir has included phased drilling of a total of 48 producers and injectors from L pad, V pad and Z pads and numerous additional appraisal wells, BP said in its progress report.

Orion production is commingled with initial participating area and Borealis output and flows to GC-2 for processing.

Water injection started in December 2003. The waterflood was designed to increase recovery and provide pressure support in the Orion reservoir.

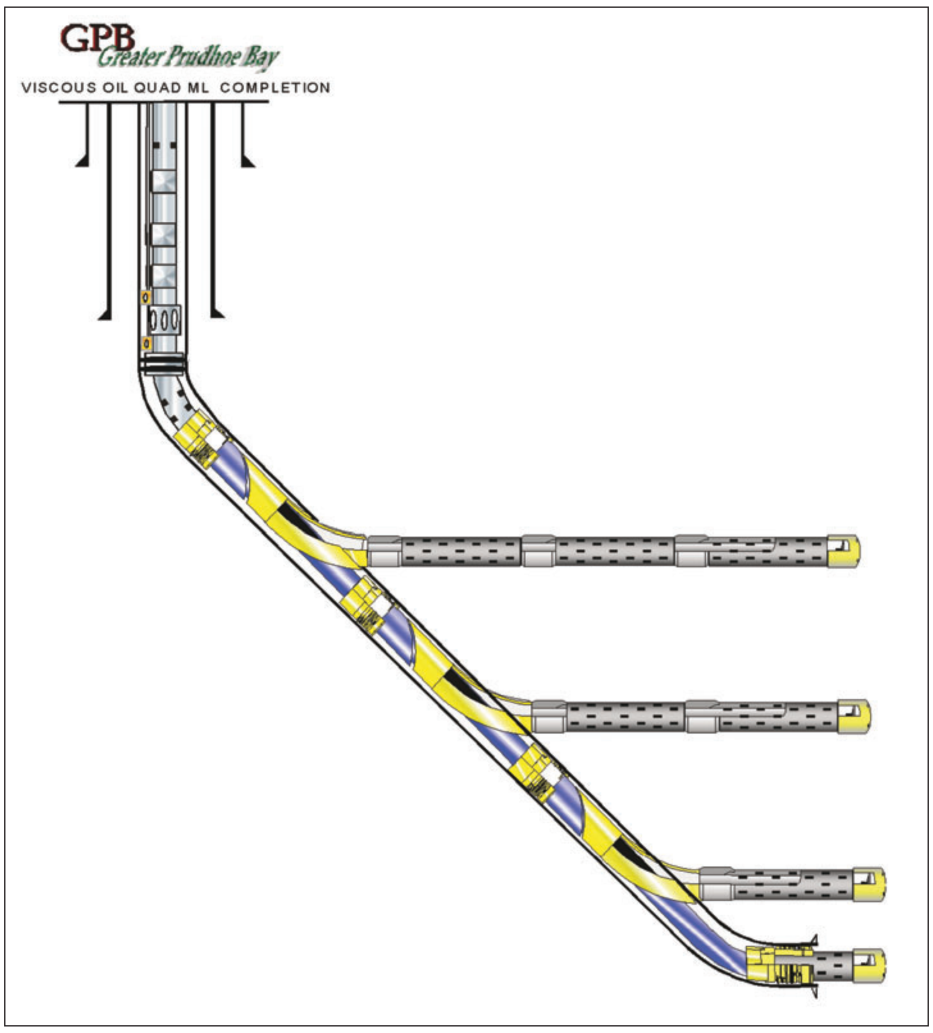
Tertiary recovery utilizing Prudhoe Bay MI for WAG was initiated in October 2006.

Central and southern areas of Orion are being developed using existing and expanded infrastructure at L, V and Z pads.

As of June 30, the Orion reservoir is being produced from seven Schrader Bluff sands (Nb, OA, OBa, OBb, OBc, OBd, and OBe).

During the reporting period, MI was injected into 14 Orion wells and it was determined via production logging that the Oba lateral in L-202 had a matrix bypass event to the aquifer in January 2018. Long term options to remediate the problem are being evaluated, BP said.

In addition, matrix bypass events between V-212i and V-204 (OA and Oba



COURTESY OF BP EXPLORATION (ALASKA)

BP took its experience at Milne Point to Orion and in 2004 drilled the first level-three quad-lateral multi-lateral well in the world.

sands) and V-222i and V-204 (OA sand) were confirmed via separate red dye tests and options to remediate the events are being evaluated.

Waterflood regulating valve change-outs were performed on seven injection wells, which BP said are "significant operations requiring several pieces of equipment for several days. They are performed to adjust injection profiles and/or ensure correct regulator function."

Two production logs were also run in the Orion field. Installation of sand-face pressure gauges for each injection zone in new injectors started in January 2007. This technology has enabled identification of matrix bypass events, the company said.

The monitoring of sand-face pressure gauges is an "integral part of the base management process and has also helped identify problematic waterflood regulating valves."

A total of 65 wellwork jobs were conducted in the one year reporting period. Of the 65, 20 were rate adding with the remainder being maintenance, surveillance, rate sustainment, and pre/post drilling.

In addition, rig workovers on L-200A and V-227 were approved during the reporting period and are scheduled to be done this year.

No wells were drilled or completed during the progress reporting period ending June 30.

Still studying, evaluating Orion

As mentioned, GC-2 in the Prudhoe Bay unit was originally built to handle light, not viscous, crude.

Sand-laden viscous oil requires a substantially enhanced solids handling capability, BP said. The current volumes of viscous oil entering GC-2 have led to "operational difficulties and increased wear on plant components."

To mitigate these problems at GC-2 in 2012 and 2013 BP upgraded its solids handling capabilities at the gathering center. An accumulator was installed, and improvements were made in sand jetting procedures and dehydrator sand jetting. The equipment was commissioned in mid-2013.

Although there was some improvement, the project did not yield the desired level of improvements, BP said.

Additional engineering work is "ongoing to evaluate design improvements to resolve certain issues with the solids handling system," the company said.

Subsurface uncertainties have also impacted production, including the optimal design and placement of wells.

"Learnings from the ongoing modeling work and completion studies will be incorporated into any future developments in the Orion PA," BP said in its progress report.

Additionally, BP is looking for ways to address the significant downtime affecting viscous wells in the northwest portion of the Orion field. Those wells have been down nearly half the time in recent years due to sand production, matrix bypass events and downhole equipment failures.

The company is studying alternate well designs, saying these designs or junction technology and sand control technology are a requirement.

Fixes to one such well was tested in March. BP is looking to deploy the modified equipment used in it to another existing well that can be recompleted across the Schrader to ensure the equipment works as designed.

A single sand horizontal well with an ultrafine screen completion is being evaluated to redevelop the OBd sand; however, there are drilling and completion challenges with it, so BP continues to study the situation.

One of the longest delayed projects at Orion is the proposed I pad, which the company claims is dependent "upon the results of sand control technology deployed in the Schrader Bluff formation and the business environment."

Orion 2020 POD

Because of the variability in sand and oil quality between zones at Orion, reservoir surveillance has been undertaken to develop a better understanding of the reservoir performance by zone and to design a development program to maximize recovery.

For producers, production allocation efforts focus on using geochemical fin-

see **BP SATELLITES** *page 12*

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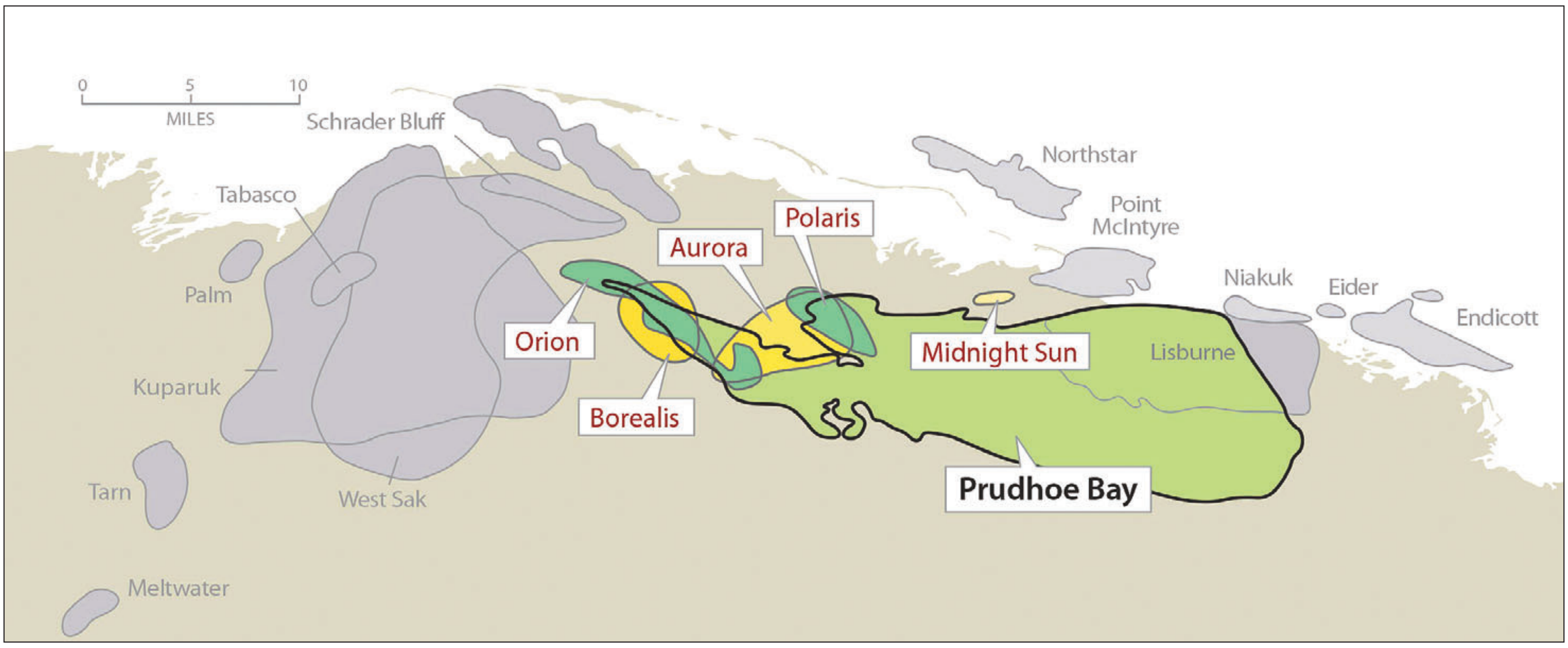

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BP SATELLITES

gerprinting analysis on produced oil. This technique is in use world-wide and has proven useful in the Schrader Bluff fields on the North Slope, BP said in its 2020 POD.

The complex nature of multilateral designs makes conventional production logging for zonal contribution difficult, the company noted.

For injectors, efforts include injection logging and zonal control using flow regulators. Work is ongoing to balance waterflood pattern voidage and provide proper pressure support.

No new wells were mentioned in the Orion 2020 POD, although BP said the wellwork program will be maintained — and the company will continue evaluating sidetrack options for the long term shut-in patterns at L pad.

Regarding potential new projects, BP said development plans for the remaining opportunities in the Orion field will focus on reducing risks and costs.

Polaris oil production

The average oil production rate for the Polaris field for the reporting period ending June 30 was 3,969 bpd, down from the previous year of 4,158 bpd, but close to the 3,891 bpd daily average for the year before that.

Of the estimated 1 billion barrels of oil in place at Polaris, cumulatively the field has produced 24.7 bpd through the end of June.

Four wells were active at S pad as of June 30 — 1 producer and 3 injectors. And 20 wells were active at W pad — 7 producers and 13 injectors.

The most recent well drilled in the Polaris field was W-221, an injector spud in May 2011.

Annual progress at Polaris

BP discovered Polaris in 1969 while delineating the Prudhoe Bay field and brought Polaris online in 1999 from S and W pads. Development of the Polaris reservoir has involved phased drilling of a total of 28 production and injection wells from those two pads, with initial drilling starting in November 1997.

Production is commingled with IPAs and Aurora production on S pad, and with IPA production on W pad, and is then processed at GC-2.

Water injection began in May 2003.

W 215i injected MI for a short time in 2006, but the offset producer was subsequently shut-in, so the water-alternating-gas cycle was curtailed.

MI injection in Polaris resumed in November 2009.

Polaris is managed as a WAG flood, with injectors alternating between produced water and MI.

During the progress reporting period ending June 30, MI was injected into seven Polaris wells. S pad MI was down from third quarter 2018 to first quarter 2019 for planned maintenance.

No new matrix bypass events were identified during the reporting period.

Waterflood regulating valve changeouts were performed on three injection wells.

During the reporting period, two injection logs were run — installation of sandface pressure gauges for each injection zone in new injectors started in 2007, enabling identification of matrix bypass events.

A total of 31 wellwork jobs on producers and injectors were done. Of the 31, seven were rate adding with the remainder being maintenance and rate sustainment.

Work continued with developing plans for two new WF/EOR patterns on S pad. The Northern S pad pattern is planned for a three well development (one multilateral producer (S-202) and two vertical injectors (S-201Ai and S-210i), which are planned for fourth quarter 2019.

Modeling and well planning work are currently underway for the southern S pad pattern. If proven to be viable, development of additional areas at S pad with good oil mobility would be limited to the number of donor wellbores and surface slots available that are able to reach the target without anti-collision issues, BP said.

The modeling and completions studies work at S pad will transfer to other areas in both the Orion PA and Polaris PA. "Consideration of further potential M and S pad viscous oil development is contingent upon the results of sand control technology deployed in the Schrader Bluff formation and the business environment."

During the reporting period, work continued on evaluating technologies and potential deployment locations within the Orion PA for demonstration of sand control completions. If Schrader Bluff sand control alternatives prove successful at Orion, the potential for deployment in the Polaris PA will be evaluated, BP said.

Polaris 2020 POD

Many of the projects at Polaris and planned for the immediate future, particularly those involving viscous oil and sand control, overlap with those at Orion.

The POD calls for wellwork to continue to maintain production and mitigate decline.

Development plans within Polaris are focused on reducing risks and cost.

During the 2020 POD period, BP will continue to gather data from the current wells and work will continue evaluating options for alternative completion designs and technologies that are intended to improve junction reliability and control sand production.

Regarding M and S pad development, during 2020 BP plans to continue to work on dynamic modeling to help with reservoir management and development in the Polaris field. Alternative sand control technology will be studied for future deployment in the Polaris PA.

At least one well test per month will be used to check the performance curves and to verify system performance. No NGLs are allocated to Polaris. ●

Editor's note: Plans for 2020 could change if the sale of BP's Alaska assets to Hilcorp closes and Hilcorp or one of the other major owners of the western satellites takes over as operator, including ConocoPhillips and ExxonMobil.

—KAY CASHMAN

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